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1.0 INTRODUCTION

1.1 Project Background

1.1.1 Frodsham Solar Limited ('The Applicant') has commissioned this report to assist in the undertaking of a Habitats Regulations Assessment (HRA) by the relevant Competent Authority for the proposed Frodsham Solar Project ('the Proposed Development').

1.1.2 The Proposed Development is classified as a Nationally Significant Infrastructure Project (NSIP) and therefore Frodsham Solar Limited ('the Applicant') is applying for a Development Consent Order (DCO) to construct, operate and ultimately decommission the Proposed Development.

1.1.3 The Proposed Development comprises a new solar energy generating station and an associated on-site Battery Energy Storage System (BESS) on land at Frodsham Marsh, Frodsham, Cheshire West and Chester. It also includes the associated infrastructure for connection to the local electricity distribution network, as well as a private wire electricity connection that would enable local businesses to utilise the renewable energy generated by the Proposed Development.

1.1.4 For a detailed description of the Proposed Development, refer to **ES Volume 1 Chapter 2: The Proposed Development [EN010153/DR/6.1].**

1.2 The Purpose of the Report

1.2.1 The following reports which also have been submitted with the DCO application contain information relevant to the HRA: **Environmental Statement (ES) Vol 1 Chapter 8: Ornithology [EN010153/DR/6.1]**, **Appendix 8-1: Ornithology Survey Report [EN010153/DR/6.2]** and **Outline Landscape and Ecology Management Plan [EN010153/DR/7.13] and the Outline Non Breeding Bird Mitigation Strategy (oNBBMS) [EN010153/DR/8.32]**.

1.2.2 All figures detailing ornithology information are presented in **Environmental Statement (ES) Vol 1 Chapter 8: Ornithology [EN010153/DR/6.1]** and the associated technical report within the **ES Vol 2 Appendix 8-1: Ornithology Survey Report [EN010153/DR/6.2]**.

1.2.3 Under the Conservation of Habitats and Species Regulations 2017 (as amended[i]), hereafter referred to as the 'Habitats Regulations', all competent authorities must consider whether any plan or project could affect a European site before it can be authorised or carried out. Where the potential for Likely Significant Effects (LSE) cannot be excluded, the competent authority must make an Appropriate Assessment (AA) decision of the implications of the plan or project for the identified European site(s).

1.2.4 The purpose of this report is to provide evidence to determine the potential for the Proposed Development to impact on European sites. This will enable the competent authority (in this case the Secretary of State) to make the AA decision in accordance with U.K. legislation (refer to Section 2 for further legislative details).

1.2.5 Only common species names are referred to throughout this report.[ii] Full ornithological nomenclature is provided within **ES Vol 2 Appendix 8-1: Ornithology Survey Report [EN010153/DR/6.2]**, including common and scientific species names, together with species conservation status and legislative protection where relevant.

1.2.6 For the avoidance of doubt, the following areas are defined (which collectively comprise the Order Limits), as shown in **Figure 3**.

(1) the 'Solar Array Development Area (SADA)' comprising the area that would include solar photovoltaic (PV) modules and support frames, internal access tracks, cabling, inverters, transformers, the solar array substation (known as the 'Frodsham Solar Substation) and the BESS;

(2) the 'Non-Breeding Bird Mitigation Area (NBBMA)' comprising land primarily within Cell 3 and Cell 2, which currently forms part of the Frodsham Wind Farm ('FWF') mitigation[iii]. Also included in this area is grassland which extends

[i] The Conservation of Habitats and Species Regulations 2017, SI 2017/1012. Available at: Legislation.gov.uk (Accessed: 2 May 2025).
[ii] British Ornithologists' Union. (n.d.). British List: Bird Names. Available at: https://bou.org.uk/british-list/bird-names/ (Accessed: 17 March 2025).
[iii] The NBBMA is defined in Schedule 1 of the draft DCO as Work No. 6C. Details of the NBBMA are provided in the Outline Non Breeding Bird Mitigation Strategy ([EN010153/DR/8.32]), which describes the proposed mitigation and excludes the strip of the Manchester Ship Canal embankment along the northern boundary of Work 6C, as this area is not considered be an optimal area for SPA birds.

eastwards from Cell 3 towards 'Marsh Farm' buildings, and a series of pools which run parallel to the Manchester Ship Canal and form the boundary of Cell 3. Land within the NBBMA would be used as a mitigation area for the anticipated displacement of wetland birds associated with the Mersey Estuary, as well as an enhancement area for wetland birds (see section 3.1 for more detailed description);

(3) the 'SPEN/National Grid Substation' comprising the existing SPEN/National Grid Substation and access to the substation compound, and adjacent land associated with the grid connection from Frodsham Solar Substation to the SPEN Substation; and

(4) the 'Skylark Mitigation Area' ('SMA'). The SMA comprises land which will be managed for the benefit of skylarks (a ground-nesting bird species) for the operational lifetime of the Proposed Development (see **ES Volume 3 Figure 1-2 [EN010153/DR/6.3]).** No Development, other than habitat management will occur within the SMA.

(5) 'Private Wire Connection' – which includes land to facilitate future electricity connections to businesses located south-west of the Proposed Development;

(6) the 'Main Site Access without Private Wire Connection' comprising the access road without private wire connection to the west of the SADA.

1.2.7 For avoidance of doubt, **Figure 4** provides a labelled overview of the key areas within and beyond the Order Limits that are referred to throughout this document.

1.2.8 The effects arising from the development of the NBBMA is evaluated separately in terms of potential environmental impacts, mitigation measures, and compliance with conservation objectives due to the anticipated staggering of the Proposed Development construction program (as explained in Section 4, which sets out that the development of the NBBMA will be undertaken prior to construction of adjacent areas of solar development)

1.2.9 This dual-phase approach ensures a comprehensive evaluation of ecological considerations and the implementation of appropriate mitigation strategies to protect European Sites.

1.3 Documents referred to in this report

1.3.1 The HRA has taken account of, and should be read in conjunction with, the documents produced as part of the application and examination:

i) ES Vol 2 Appendix 8-1: Ornithology Survey Report [EN010153/DR/6.2];
ii) ES Vol 1 Chapter 8 Ornithology [EN010153/DR/6.1];
iii) ES Vol 1 Chapter 7: Terrestrial Ecology [EN010153/DR/6.1];
iv) ES Vol 1 Chapter 9: Flood Risk, Drainage and Surface Water [EN010153/DR/6.1];
v) Outline Decommissioning Environmental Management Plan [EN010153/DR/7.7];
vi) ES Vol 2 Appendix 4-1: Noise Impact Assessment [EN010153/DR/6.2];
vii) Noise Technical Note in response to Natural England's (NE) Relevant Representations RR-012 [Appendix B to this document]
viii) Outline Landscape and Ecology Management Plan [EN010153/DR/7.13] as updated during Examination;
ix) Outline Construction Environmental Management Plan [EN010153/DR/7.5] as updated during Examination;
x) ES Vol 2 Appendix 4-2: Construction Dust Assessment [EN010153/DR/6.2];
xi) ES Vol 2 Appendix 4-3: Glint and Glare Assessment [EN010153/DR/6.2];
xii) Non-Breeding Bird Mitigation Strategy (oNBBMS) [EN010153/DR/8.32] as updated during Examination;
xiii) Outline Operational Environmental Management Plan [EN010153/DR/7.6], as updated during Examination ; and
xiv) ES Vol 1 Chapter 10: Ground Conditions [EN010153/DR/6.1]

1.4 Engagement with Natural England and the RSPB

1.4.1 It is noted that, following the submission of the DCO Application in May 2025, Natural England provided a detailed response to the HRA on 28th August 2025. In response to these comments, meetings were arranged between the Applicant and Natural England to review at approximately six weekly intervals, to address, and reach

agreement on, the issues raised as part of Natural England's Relevant Representation, in a Statement of Common Ground (SoCG).

1.4.2 During the examination period, progress has been made between the Applicant and the relevant bodies listed in 1.4

1.4.3 Natural England confirmed in **REP5-056** that the mitigation proposed within the NBBMA is sufficient to avoid an adverse effect on site integrity, and that incorporating Cell 2 into the NBBMA would constitute an additional enhancement. However, the response also noted that Natural England would have concerns if RSPB is not willing to proceed with the role of the organisation responsible for the management of the NBBMA. Natural England confirmed it was satisfied that all matters raised, including those associated with cumulative and in-combination effects, disturbance and barriers to movement, the proposed approach to adaptive management, and the consideration of mitigation vs compensation, had been addressed.

1.4.4 Following Deadline 5, Natural England and the RSPB met to discuss the project. Following that meeting, Natural England informed the Applicant that, based on the engagement with the RSPB, it had reviewed the advice given at Deadline 5 and could only conclude that there would be no likely adverse effects on integrity if Cell 2 was integrated into the NBBMA. On this basis, the Applicant has altered the extent of Work 6C and Work 1 to exclude the solar array from Cell 2 and to integrate this land into the NBBMA.

1.4.5 A joint Position Statement between the Applicant, NE and RSPB has been submitted at Deadline 6 to reflect the parties' respective positions in light of the above, which is recorded in the Applicant Response to Interested Parties D5 Submissions [**EN010153/DR/8.50**].

1.4.6 The altered extents are also reflected in the associated Outline Non-Breeding Bird Mitigation Strategy [EN010153/DR/8.32] previously included as Appendix B of the outline Landscape and Ecology Management Plan [EN010153/DR/7.13] and is illustrated of the Illustrative Environmental Masterplan, Appendix A of the **Outline Landscape and Ecology Management Plan (oLEMP) [EN010153/DR/7.13]**.

1.4.7 For avoidance of doubt, any reference of the NBBMA refers to Cell 2 and Cell 3 collectively, unless stated otherwise.

2.0 LEGISLATIVE BACKGROUND

2.1.1 Council Directives 92/43/EEC[iv] on the Conservation of natural habitats and of wild fauna and flora ("the Habitats Directive"[v]) and 2009/147/EC on the conservation of wild birds ("the Birds Directive") provide for the designation of sites for the protection of certain species and habitats. The sites designated under these Directives are collectively termed European sites and form part of a network of protected sites across Europe, known as the Natura 2000 network. In the UK the Habitats Regulations transpose these Directives into national law.

2.1.2 The Conservation of Habitats and Species Regulations 2017 ('the Habitats Regulations') is one of the pieces of domestic law that transposed the land and marine aspects of the Habitats Directive and certain elements of the Wild Birds Directive. Following the changes made by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 ('the 2019 Regulations'), SACs and Special Protection Areas (SPAs) in the U.K. no longer form part of the EU's Natura 2000 ecological network. The 2019 Regulations have created a national site network on land and at sea, including both the inshore and offshore marine areas in the UK. The national site network includes existing SACs and SPAs, new SACs and SPAs designated under these Regulations.

2.1.3 Any references to Natura 2000 in the Habitats Regulations and in guidance now refers to the new national site network.

2.1.4 The U.K. Government is also a signatory to the Convention on Wetlands of International Importance 1972 ("the Ramsar Convention"). The Ramsar Convention provides for the listing of wetlands of international importance.

2.1.5 The Overarching National Policy Statement (NPS[vi]) for Energy (EN-1) states that:

[iv] *Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. Available at: EUR-Lex (Accessed: 29th April 2025).*
[v] *Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds. Available at: EUR-Lex (Accessed: 29th April 2025).*
[vi] *Department for Energy Security and Net Zero (2024) Overarching National Policy Statement for Energy (EN-1). Available at: GOV.UK (Accessed: April 2025). This text is also reflected in the NPSs published in November 2025.*

'As a matter of policy, the following should be given the same protection as sites covered by the Habitats Regulations and an HRA will also be required:

(a) potential Special Protection Areas and possible Special Areas of Conservation;

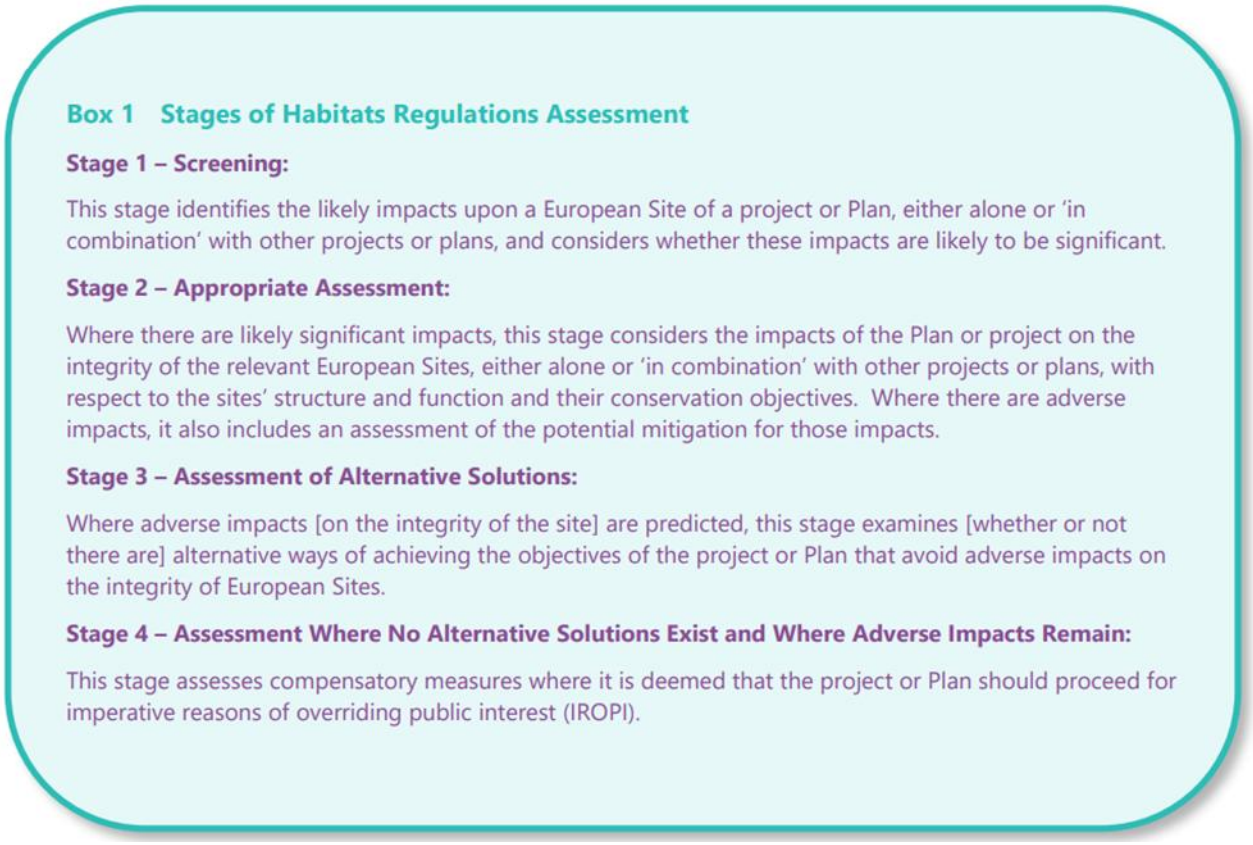
(b) listed or proposed Ramsar sites; and

(c) sites identified, or required, as compensatory measures for adverse effects on any of the other sites covered by this paragraph.'

2.1.6 For the purposes of this Appendix, in line with the Habitats Regulations and relevant Government policy, the term "European sites" and new national site network includes Special Areas of Conservation ("SAC"), candidate SACs ("cSAC"), possible SACs ("pSAC"), Special Protection Areas ("SPA"), potential SPAs ("pSPA"), Sites of Community Importance ("SCI"), listed and proposed Ramsar Sites and sites identified or required as compensatory measures for adverse effects on any of these sites.

2.1.7 Amongst other things, the Habitats Regulations define the process for the assessment of the implications of plans or projects on European sites. This process is termed the HRA.

2.1.8 HRA can involve up to four stages, as detailed in Box 1 below.



Box 1 Stages of Habitats Regulations Assessment

Stage 1 – Screening:

This stage identifies the likely impacts upon a European Site of a project or Plan, either alone or 'in combination' with other projects or plans, and considers whether these impacts are likely to be significant.

Stage 2 – Appropriate Assessment:

Where there are likely significant impacts, this stage considers the impacts of the Plan or project on the integrity of the relevant European Sites, either alone or 'in combination' with other projects or plans, with respect to the sites' structure and function and their conservation objectives. Where there are adverse impacts, it also includes an assessment of the potential mitigation for those impacts.

Stage 3 – Assessment of Alternative Solutions:

Where adverse impacts [on the integrity of the site] are predicted, this stage examines [whether or not there are] alternative ways of achieving the objectives of the project or Plan that avoid adverse impacts on the integrity of European Sites.

Stage 4 – Assessment Where No Alternative Solutions Exist and Where Adverse Impacts Remain:

This stage assesses compensatory measures where it is deemed that the project or Plan should proceed for imperative reasons of overriding public interest (IROPI).

2.1.9 Stages 1 and 2 are covered by Regulation 63 of the Habitat Regulations, and Stages 3 and 4 are covered by Regulations 64, 68 and 84 of the Habitat Regulations.

2.1.10 With respect to Stage 2, the integrity of a European Site relates to the site's conservation objectives and has been defined in guidance as "the coherent sum of the site's ecological structure, function and ecological processes, across its whole area, which enables it to sustain the habitats, complex of habitats and/or populations of species for which the site is designated".[vii] An adverse effect on integrity, therefore, is likely to be one which prevents the site from making the same contribution to favourable conservation status for the relevant feature as it did at the time of designation. The HRA screening process uses the threshold of LSE to determine whether effects on European sites should be the subject of further assessment. The Habitats Regulations do not define the term LSE. However, in the Waddenzee case

[vii] *Natural England. (2021). Habitats Regulations Assessments: Protecting a European Site. Available at: https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site [Accessed 12 May 2025]*

(Case C127/02), the European Court of Justice found that an LSE should be presumed, and an AA carried out if it cannot be excluded on the basis of objective information that the plan or project will not have significant effects on the conservation objectives of the site concerned, whether alone or in combination with any other project. The Advocate General's opinion of the Sweetman case (Case C-258/11) further clarifies the position by noting that for a conclusion of an LSE to be made "there is no need to establish such an effect...it is merely necessary to determine that there may be such an effect" (original emphasis).

2.1.11 For the reasons highlighted above the assessment process follows the precautionary principle throughout and the word 'likely' is regarded as a description of a risk (or possibility) rather than in a legal sense an expression of probability.

2.1.12 Screening can be used to screen-out European sites and elements of works from further assessment, if it is possible to determine that significant effects are unlikely (e.g., if sites or interest features are clearly not vulnerable (exposed and / or sensitive) to the outcomes of the proposal due to the absence of any reasonable impact pathways).

2.1.13 The screening process has two potential conclusions, namely that the Proposed Development, alone or in combination with other developments, could result in:

- No LSE on any of the qualifying features of the site; or
- LSE identified, or cannot be ruled out, on one or more of the qualifying features of the site.

2.1.14 Only the second of these outcomes will trigger an AA. If one or more LSE are identified, or cannot be ruled out, it is then necessary to proceed to Stage 2 and produce an AA.

2.1.15 On 12 April 2018, the Court of Justice of the European Union (CJEU) issued a judgment on Case C323/17 (People over Wind, Peter Sweetman v Coillte Teoranta)[viii] which stated (at paragraph 41):

"Article 6(3) of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora must be interpreted as meaning that, in order to determine whether it is necessary to carry out, subsequently, an appropriate assessment of the implications, for a site concerned, of a plan or project, it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects [mitigation] of the plan or project on that site."

2.1.16 This means that any mitigation relating to protected sites under the Habitat Regulations 2017 Regulation 63 (1) will no longer be considered at the screening stage but taken forward and considered at the AA stage to inform a decision on whether no adverse effects on site integrity can be demonstrated.

2.1.17 The assessment provided within this Information to Inform a Habitats Regulations Assessment report takes into account the CJEU ruling on 'People over Wind' and the precautionary principle has been applied as per the Waddenzee case.

[viii] *Judgment of the Court (Seventh Chamber) of 12 April 2018 People Over Wind and Peter Sweetman v Coillte Teoranta Request for a preliminary ruling from the High Court (Ireland) Case C-323/17*

3.0 DESCRIPTION OF THE PROPOSED DEVELOPMENT

3.1 Site Description

Order Limits

3.1.1 The expected maximum area of land potentially required for the construction, operation and maintenance of the Proposed Development, which includes land required for permanent and temporary purposes, is shown on **ES Vol 3 Figure 1-1: Site Location [EN010153/DR/6.3]**. This is referred to as the "Order Limits". For the avoidance of doubt, the terms Order Limits and Site refer to the same land area, as shown on **ES Vol 3 Figure 1-1: Site Location [EN010153/DR/6.3]**.

The Order Limits and Surrounding Area

3.1.2 The Order Limits is located approximately 500 m to the north of the centre of Frodsham Town Centre within the administrative areas of Cheshire West and Chester Council (CWaCC). The Proposed Development location is shown on **ES Vol 3 Figure 1-1: Site Location [EN010153/DR/6.3].** Key environmental and planning designations on, and in close proximity to, the Order Limits are shown on **ES Vol 3 Figure 1-3: Planning and Environmental Designations [EN010153/DR/6.3]**, these are described below.

3.1.3 The Order Limits comprises a single red line boundary that covers all land required for the Proposed Development, which in total is approximately 337.5 ha. This encompasses the areas required for solar development, all associated infrastructure, BESS, access, cabling, the grid connection to the SPEN Substation, the private wire connections to local businesses and areas for mitigation including the Skylark Mitigation Area and the Non-Breeding Bird Mitigation Area (NBBMA).

3.1.4 The Solar Array Development Area Context Plan is shown within **ES Vol 3 Figure 1-4: Solar Array Development Area Site Context Plan [EN010153/DR/6.3]**, which illustrates the key features described below.

3.1.5 The Solar Array Development Area (SADA) covers an area of approximately 230ha (reduced from the original 246ha prior to inclusion of Cell 2 into the NBBMA). It would be located at the eastern extent of Frodsham and Helsby Marsh, an area of land between the Mersey Estuary and the M56. The northern boundary of the SADA is

formed by the River Weaver and the former INEOS Inovyn Dredging Deposit Ground, the north-west boundary by the Manchester Ship Canal, with the Mersey Estuary lying beyond. The western boundary of the SADA is formed by three of the former Manchester Ship Canal Dredging Deposit Ground Cells; Cell 2, Cell 3 and Cell 6. Cell 2 and Cell 3 form part of the NBBMA. The southern boundary of the SADA is formed by agricultural fields and the M56 motorway.

3.1.6 The SADA comprises two distinct areas:

(1) The Western SADA. This includes the eastern cluster of Frodsham Wind Farm and totals approximately 136ha (reduced from the original 152ha prior to inclusion of Cell 2 into the NBBMA). The land forms part of the former Manchester Ship Canal Dredging Deposit Ground, and includes Cells 1 and 5. The cells have been restored to agricultural land and are now grazed by sheep / cattle (by the tenant of Frodsham Marsh Farm). The land in this area lies between approximately 9.5 m and 12.5 m above ordnance datum (AOD), and therefore is elevated above the other two sections of the Solar Development Area.

(2) The Eastern SADA, formed by two land parcels with differing characteristics:

(a) Former agricultural land used by Frodsham Wildfowlers (approximately 36 ha): the central area of the SADA is former agricultural land which has been left fallow and managed to encourage use by wildfowl. This area is currently used for recreational shooting by Frodsham Wildfowlers. This area of the Order Limits is crossed by a series of ditches which have been used to drain and manage water levels on Frodsham and Helsby Marsh. The land in this area lies at approximately 6 m AOD. The area also contains an area also referred to as “the Lum”, which is a waterbody located in the most northern extent of the area, shown on Sheet 2 of the Illustrative Environmental Masterplan, Appendix A of the **Outline Landscape and Ecology Management Plan (oLEMP) [EN010153/DR/7.13].**

(b) Agricultural land (approximately 61 ha): The south-eastern portion of the SADA is agricultural land. It is understood that the land has been used for growing crops and silage (this is not linked to the activities of Frodsham Marsh Farm). Some areas of the fields appear to have been left fallow and

have been colonised with scrub and wet grassland. Hedgerows demarcate boundaries between field units. The land in this area lies at approximately 5 m AOD.

3.1.7 In the eastern half of the SADA (i.e. the area to the east of Brook Furlong), fields tend to be enclosed by dense hedgerows and tree belts. In the western half of the SADA, the Order Limits are more open, with only occasional trees and remnant sections of hedgerow. There are also areas of scrub and woodland present on the embankments of the Manchester Ship Canal (MSC) dredging deposit cells. The landform across the Order Limits is largely flat. However, engineered embankments are present that result in changes in levels across the Order Limits. The embankments are generally associated with the cells of the former MSC dredging depot grounds, flood defences and structures associated with the M56.

3.1.8 The NBBMA comprises the land on Cell 3 and Cell 2 located south of Frodsham Marsh Farm, a section of land between Cell 3 and the MSC, and land immediately surrounding Marsh Farm which total 70.81 ha. The land between Cell 3 and the MSC, and the land immediately surrounding Marsh Farm, forms part of the Mersey Estuary Site of Special Scientific Interest (SSSI). Cell 3 forms part of the mitigation for Frodsham Windfarm and comprises areas of grassland with some manmade scrapes (shallow areas of water). A number of ponds are located in the land between Cell 3 and the MSC, these have been used for recreational fishing which appears to be unregulated.

3.1.9 The Skylark Mitigation Area (SMA) comprises an area of arable land approximately 5.58ha in an area located to the south of Moorditch Lane and separated from the Solar Development Area and the remainder of the Order Limits by Cell 6. The extent of the SMA has evolved since the PEIR submission following consultation, with agreement subsequently reached with the landowner in respect of the land now identified as Work 6B. The SMA has been specifically designed to enhance and safeguard skylark breeding productivity through targeted habitat management. It should be noted that the NBBMA and other habitat enhancements within the Solar Array (but not limited to) are not included within the overall total (hectares) of the SMA mitigation area. However, these areas will provide direct and indirect benefits to skylark through the enhancement and long-term management of the NBBMA (70.81 ha) and structural planting throughout the Order Limits. Such improvements

and management are recognised as beneficial to the survival and breeding success of the species as evidenced in historic[ix] and more recent literature.[x]

3.1.10 The Main Site Access is from the west, leading from Pool Lane roundabout. Vehicles accessing the Order Limits would turn onto Grinsome Road (a private road) from Pool Lane roundabout and travel east towards Protos[2] for approximately 1.5 km, routing north at Grinsome Road Roundabout, along Road 1 of Protos. Vehicles would then turn east along Marsh Lane which provides access to Frodsham Wind Farm. The Frodsham Wind Farm access tracks provide access to the Solar Array Development Area. There would be no access to the Order Limits by vehicles associated with Frodsham Solar from Frodsham during construction, operation or decommissioning, other than for emergency vehicles. Once operational there would potentially be a new public car parking area on Moorditch Lane, accessed via Brook Furlong (refer to the Illustrative Environmental Masterplan, Appendix A of the **Outline Landscape and Ecology Management Plan (oLEMP) [EN010153/DR/7.13].**for details on the proposed new public car parking area).

3.1.11 A series of Public Rights of Way (PRoW) cross the Order Limits; these are illustrated on **ES Vol 3 Figure 1-5: Public Rights of Way [EN010153/DR/6.3]**. The PRoW include footpaths and restricted byways, which allow access by foot, horseback and cyclists. National Cycle Route 5 runs along a section of the Main Site Access and along part of the southern edge of the Order Limits.

3.2 Non-Breeding Bird Mitigation Area, and Biodiversity Enhancement Zones within the Order Limits

3.2.1 The following areas are located within the Order Limits and are referred to as Biodiversity Enhancement Zones shown on the Illustrative Environmental Masterplan, Appendix A of the **Outline Landscape and Ecology Management Plan (oLEMP) [EN010153/DR/7.13].** and will be referenced throughout this document:

[ix] *Montag, H., Parker, G., & Clarkson, T. (2016) The Effects of Solar Farms on Local Biodiversity; A Comparative Study. Clarkson and Woods and Wychwood Biodiversity*
[x] *Solar Energy UK (2025) Solar Habitat 2025. Solar Energy UK. Available at: https://solarenergyuk.org/wp-content/uploads/2025/04/SEUK-Solar-Habitat-2025-3.pdf (Accessed: 27 February 2026).*

i) The area adjacent to the Lum and the adjacent land, an area of wetland retained and enhanced, within the Eastern SADA and is adjacent to the River Weaver and is shown as point 'G' on the aforementioned plans.

ii) a separate Biodiversity Enhancement zone, which forms part of the Proposed Development design within the Western SADA and is aimed at wider ecology outcomes and enabling the connection of people and nature, but will also act as a resource for dabbling ducks (including SPA species. This zone is located north-east of the NBBMA (at grid reference SJ 49955 79197) and is shown as point 'C' on the aforementioned plans. This area is distinct from the NBBMA.

3.2.2 Note that the NBBMA does not form part of the Biodiversity Enhancement zone areas shown on the Illustrative Environmental Masterplan, Appendix A of the **Outline Landscape and Ecology Management Plan (oLEMP) [EN010153/DR/7.13].**.

The NBBMA

3.2.3 The NBBMA boundary (as shown in the Outline Non-Breeding Bird Mitigation Strategy [EN010153/DR/8.32]) covers approximately 70.81 ha. The area within the boundary is considered to be of optimal in size and topography for non-breeding birds (see footnote iii) and is suitable for the creation of new and enhanced habitats (wetland and other neutral grassland) to benefit wetland birds recorded across the entirety of the Order Limits. The remaining area of Work No. 6C is formed by the Manchester Ship Canal embankment, which is relatively steep and therefore unlikely to be utilised by wetland birds for which the NBBMA will be managed.

3.2.4 Details of the NBBMA are provided in **ES Vol 1 Chapter 8.0: Ornithology [EN010153/DR/6.1]** and are underpinned in the **- Outline Non-Breeding Bird Mitigation Strategy (oNBBMS) [EN010153/DR/8.32]**.

3.2.5 The oNBBMS focuses on the large-scale re-engineering of Cell 3 (and a small area of Cell 2) to create a hydrologically controlled wetland and grassland system to deliver mitigation for non-breeding birds and which is in addition to that already enacted by the Frodsham Wind Farm (FWF). The NBBMA also includes the remainder of Cell 2, which will be retained as grassland.

3.2.6 The oNBBMS aims to provide all mitigation necessary for the Proposed Development to ensure that there will be no adverse effect on the integrity of the Mersey Estuary SPA and Ramsar (or the Mersey Estuary SSSI).

3.2.7 Mitigation, including for and above that already in-place for FWF, will be delivered through:

i) The provision of improved quality foraging and roosting habitats for SPA species through the retention of Cell 2 and complete re-engineering of Cell 3 and the Canal Pools area, leading to the creation of a mosaic of optimised habitats comprising grassland, wet grassland and additional scrapes with extensive wet edges and which is considerably higher quality than is currently delivered, or required to be delivered, by FWF. This will ensure that mitigation above that already in place for FWF is delivered, and therefore FWF mitigation measures continue to be provided.

ii) On-going adaptive conservation management of the NBBMA for at least the operational lifetime of the Proposed Development, and FWF which is above any management already in place under FWF. Management is intended to be under the control of recognised and suitably experienced nature conservation organisation. Conservation management of the NBBMA will extend beyond that in place under FWF by an anticipated 28 years (assuming a 40-year period of operation of the Proposed Development from 2030, with the FWF decommissioning required in 2042);

iii) Extending the seasonal availability of existing FWF mitigation in the NBBMA to include the autumn passage and spring passage periods for waterfowl and waders. This will be achieved by reducing soil permeability and through on-going dynamic habitat and water management; and

iv) Reduced disturbance of SPA species across the NBBMA through the removal of uncontrolled recreational fishing.

3.2.8 Provision of habitat and management will ensure at least current levels of on-site resources are available for curlew, lapwing and golden plover and all other Mersey Estuary SPA species recorded within the Order Limits, through the delivery of higher quality foraging habitats (particularly wet grassland and scrapes).

3.2.9 The oNBBMS includes a series of additional benefits (enhancements) for Mersey Estuary SPA, Ramsar and SSSI species which are presented in Section 3.6 of the oNBBMS. Following discussion with Natural England, these are not considered as part of the HRA.

3.2.10 Re-engineering, New Zealand Pygymyweed Management and Long-Term Functionality and SecurityDelivery of the oNBBMS requires re-engineering and recontouring land within Cell 3 to enable water to be held, moved and managed throughout the seasons. Details are presented in Section 3 of the oNBBMS.

3.2.11 A programme of landscaping and hydrological re-engineering will be undertaken to enable long-term wetland habitat creation and management. A series of existing pools, referred to as 'The Canal Pools' will be infilled to support the eradication of New Zealand Pigmyweed (NZPW). Some of the Canal Pools are located within Mersey Estuary SSSI (see paragraph 3.2.17); these pools will be reinstated in their existing footprint and fitted with sluices to enable conservation focussed water-level control.

3.2.12 Site investigation (SI) work undertaken by the Applicant (presented in Annex 3 of the oNBBMS) confirms that at least 16.2 ha of low-permeability substrate can be created, allowing a network of scrapes, swales, bunds and shallow hollows to retain water and support 9.5 ha of wet grassland throughout the year. It should be noted that the ultimate design will be informed through input from the appointed managing conservation body or professionals so as to maximise the ecological benefit of the NBBMA.

3.2.13 The NBBMA will be subject to year-round adaptive conservation management by a nature conservation organisation and will be maintained for the lifetime of the development. For those areas of the NBBMA which form part of the SSSI, the draft DCO now provides that their management in accordance with the NBBMS will form part of the management scheme of the SSSI under the Wildlife and Countryside Act 1981, securing management of that area by landowners in line with SSSI requirements post decommissioning of the Proposed Development.

3.2.14 Measurable targets focussed on habitat extent, hydrological function and delivery of the required wetland conditions will guide and monitor performance.

3.2.15 Works to establish the NBBMA are expected to take approximately 6–9 months and will be completed (and the NBBMA functional) before any other construction within the Order Limits to ensure continuous availability of functional habitat for SPA species. It has been agreed with Natural England that the NBBMA shall be considered functional when:

i) all physical works within the NBBMA are completed;
ii) the entire NBBMA area is available to support SPA bird species for which it is designed; and
iii) the entire NBBMA is free from construction-related disturbance.

3.2.16 Additional details are presented in the oNBBMS.

The Mersey Estuary Site of Special Scientific Interest

3.2.17 A section of the NBBMA falls within a management unit of the Mersey Estuary SSSI (Unit ID 1011753: Mersey Estuary SSSI – Frodsham Lagoons (012)).

3.2.18 The Wildlife and Countryside Act 1981, specifically in Sections 28A – 28S, imposes legal obligations on landowners with regards to SSSIs to ensure they manage the SSSI to favourable condition. The measures set out in the ONBBMS will support the restoration of that part of the SSSI to favourable condition through the re-creation and management of the Canal Pools area.

3.2.19 However, mitigation for the Proposed Development is not proposed for, or derived from, enabling the restoration or management of the SSSI. The DCO for the Proposed Development sets out that the detailed version of this NBBMS will become part of the 'management scheme' for the SSSI (for the purposes of section 28J of the Wildlife and Countryside Act 1981), meaning that the long-term improved outcomes for the SSSI will be secured.

3.2.20 The oNBBMS includes the following actions within the SSSI. Whilst these are not considered mitigation for the Proposed Development, they are necessary to the successful delivery of the NBBMA and management of the SSSI.

i) Eradication and/or on-going treatment of NZPW from within SSSI Unit 1011753.

ii) Restoration of pools within SSSI Unit 1011753 with features suitable for use as a high tide roost.

iii) Removal of the stand of semi-mature trees adjacent to the Canal Pools (within SSSI Unit 1011753).

The Lum

3.2.21 The Lum is an area of shallow scrapes and rush pasture, located in the Eastern SADA adjacent to the boundary with the River Weaver.

3.2.22 The Lum area will be retained and the surrounding habitats enhanced as part of the Proposed Development. Although originally a wetland featuring a standing pool, the Lum has gradually become overgrown with scattered scrub and is now dominated by neutral grassland, rushes, and tall forbs. Proposed enhancements include the creation and addition of scrapes and species-rich grassland to restore and improve the wetland habitat for wetland bird species.

Biodiversity Enhancement Zone

3.2.23 The separated isolated section of Biodiversity Enhancement zone located north-east of the NBBMA (at grid reference SJ 49955 79197) and shown as point 'C' on shown on Figure A1.1 of the Illustrative Environmental Masterplan, Appendix A of the **Outline Landscape and Ecology Management Plan (oLEMP) [EN010153/DR/7.13].**, will be enhanced as part of the Proposed Development. The area is currently dry reedbed which are under succession (i.e., being lost to scrub). Enhancements will comprise the removal of scrub and the re-instatement of open water and wet reedbed.

3.2.24 This area is at least 2.5 ha in area and is generally aimed at wider ecology outcomes and enabling the connection of people and nature but will also act as a resource for dabbling ducks (including SPA species). Whilst there will be periods of disturbance, it is relevant that many dabbling ducks forage at night and therefore the creation of open water is an additional resource for such species.

3.2.25 Between both of the Biodiversity Enhancement Zone (Point C) and the Lum area (Point G), 1 ha of new ponds, 335m of new ditches and approximately 2.1 ha of new reedbed will be created

3.2.26 Enhanced management will comprise 0.9 ha of existing ponds, approximately 10.9m of existing ditches and approximately 21.1 ha of existing reedbed.

4.0 DESCRIPTION OF THE CONSTRUCTION AND PHASING

4.1 Construction and Phasing and Lifecycle

4.1.1 The construction phase is expected to last for approximately 30 months, subject to securing a DCO in Summer 2026. It is anticipated that works will start on Site in January 2028 and be completed in mid to late 2030.

4.1.2 The construction of the Proposed Development will be split into different sub-projects / packages to enable the development to be delivered in the most efficient manner. In relation to the solar PV array areas, this is likely to be split into two main sub-projects; the western array area and the eastern array area. The western array area will comprise the solar PV array areas to the west of Brook Furlong i.e. the fields on the former MSC Dredging Deposit Ground (Solar PV Array Areas A01 to A06, with reference to **ES Volume 3 Figure 2-1 Indicative Construction Site Layout [EN010153/APP/6.3]**).

4.1.3 The eastern array will comprise the solar PV array areas to the east of Brook Furlong i.e. the agricultural land on the Frodsham Marshes area of the Order Limits (Solar PV Array Areas B01 to B18, and C01 to C06). There are also likely to be separate packages of work for the Substation and BESS, the 132kV connection to the SPEN Frodsham Substation and the 132kV Private Wire connection. The sub-projects / packages will likely be managed such that they are happening in staggered overlapping programme in order to build out the Proposed Development in the most efficient way possible whilst minimising environmental effects. See **ES Volume 2 Appendix 2-2_Indicative Construction Phasing and Resource Schedule** (as updated during Examination) which illustrates the indicative reasonable worst-case phasing envisaged for the purposes of the Environment Impact Assessment.

4.1.4 The construction of the NBBMA will be undertaken at the beginning of the development programme, anticipated early spring 2028. The NBBMA will be constructed and functional (see paragraph 4.1.6) prior to starting construction in the

Western and the Eastern SADAs in order to ensure habitat remains available for SPA wetland birds during the construction phase.

4.1.5 The primary construction stages are set out in Table 4-1 below. The activities within each key phase are described in an approximate sequential order, however, many of the activities will occur in parallel due to the scale of the Proposed Development.

4.1.6 Natural England and the Applicant have agreed that the NBBMA will be considered functional based on the following criteria:

i) All physical works within the NBBMA are completed;
ii) The entire NBBMA area is available to support SPA bird species for which it is designated for; and
iii) The entire NBBMA is free from construction related disturbance.

Table 4-1. Construction program

Phase	Category	Activities
NBBMA	Enabling Works	Establish temporary welfare facilities
		Liaison with key utility companies
		Implement temporary Public Right of Way (PRoW) management
		Improve main site access from Grinsome Road/Marsh Lane
	Construction Works	Re-engineering of Cell 3 and Canal Pools (option 1)
		Management of Cell 2
		Temporary removal and reinstatement of existing scrapes (option 1)
		Creation of additional scrapes & formation of islands (option 1)
		Establishment of managed wet grassland (~9.5 ha)
		Re-engineering of Canal Pools area (option 1)

Phase	Category	Activities
		Installation of predator exclusion measures & access control
		Eradication & management of New Zealand pigmyweed (*Crassula helmsii*) (option 2)
		Excavation and infill works
		Creation of additional grassland (~6.11 ha)
	Operational	Manage hydrology
		Maintain grassland sward height (grazing & mechanical means if required)
		Conduct monthly monitoring (September to May) and on-going adaptive management.
SADA		
Solar Array	Enabling Works	Establish construction compounds & car parking
		Construct & improve internal access roads, crossings, fencing, and surfacing

Phase	Category	Activities
		Conduct earthworks for development platforms
		Deliver solar PV modules and structures
	Construction Works	Erect solar PV mounting structures
		Install solar PV modules & cabling
		Construct PCU foundations
		Carry out 33kV trenching works & cabling
		Install PCU & conduct commissioning
		Establish minor ancillary works & landscaping
Construction Phase – BESS & Frodsham Solar Substation	Enabling Works	Establish construction compounds & welfare facilities
		Construct internal access roads, fencing & surfacing
	Construction Works	Construct foundations & drainage works

Phase	Category	Activities
		Erect buildings
		Install BESS container & balance of plant
		Install cabling & HV equipment
		Conduct testing & commissioning
		Establish minor ancillary works (e.g., lighting, security, landscaping)
132 kV SPEN Substation Grid Connection	Enabling Works	Establish construction compounds & welfare facilities
	Construction Works	Install Trident pole foundations & erect poles
		Conduct trenching at terminal ends of 132kV connection
		String 132kV cables on Trident poles
		Install HV equipment in SPEN Substation
		Conduct testing & commissioning
	Construction Works	Excavate trenches in sections

Phase	Category	Activities
132 kV Private Wire Grid Connection		Construct Jointing Chambers
		Pull cables between Jointing Chambers
		Connect cables within Jointing Chambers
		Conduct testing & commissioning
	Operational The operational lifespan of components within the scheme varies, with solar modules expected to last 15–30 years (allowing for one replacement per module and a 10% contingency is assumed), while mounting structures, DC/AC cabling, trident poles, and substation equipment are designed for up to 40 years. Shorter lifespans are anticipated for items such as the battery storage unit (10–20), solar balance of plant (20 years, replaced as needed), fencing (10 years), meteorological monitoring equipment (5–15 years), and communication/CCTV systems (10–20 years).	Conduct regular visual inspections of infrastructure
		Perform scheduled inspections & equipment testing
		Replace consumable items (e.g., inverter filters)
		Clean solar PV modules, if required
		Repair/replace solar modules & components, if damaged
		Deliver spare parts, replacement equipment & consumables
		Conduct water management (e.g., clearing drainage ditches)
		Perform vegetation management (e.g., cut back grass, hedges,

Phase	Category	Activities
		trees) and maintain ecological enhancements
Additional considerations during the operational phase		Faulty/degraded equipment replacement may require low-frequency HGV movements on an ad-hoc basis.
		No continuous lighting across the development; security lighting will be sensor-triggered at key electrical infrastructure.
Decommissioning Phase	Final details are to be determined pursuant to the **Outline Decommissioning Environmental Management Plan [EN010153/DR/7.7]** as updated during Examination	Decommissioning details to be finalised per DCO requirements at end of operational lifespan.

5.0 EXISTING CONDITIONS

5.1.1 This section describes the existing ornithological baseline relevant to the HRA, with a particular focus on land within and surrounding the Order Limits that functions, or has the potential to function, as Functionally Linked Land (FLL) to the Mersey Estuary SPA and Ramsar site. It reviews a combination of desk-based and field surveys to identify spatial distribution, abundance, diversity and seasonality of SPA qualifying species and those part of the wider waterbird assemblage.

5.1.2 The baseline conditions presented here provide the foundation and evidential baseline for subsequent assessment in relation to European site integrity.

Functionally Linked Land Within and Surrounding the Order Limits

5.1.3 In the context that the Proposed Development does not directly affect any European sites, the primary consideration of this HRA is potential impacts on land that meets the criteria of FLL to the nearest relevant European site, in this instance the Mersey Estuary SPA and Ramsar.

5.1.4 The following section identifies and describes the areas within and surrounding the Order Limits that could potentially meet the criteria of FLL, based on a combination of desk-based analysis and field survey data and applying the broad Natural England definition of FLL as "*areas of land occurring within 20 km of an SPA, that are regularly used by significant numbers of qualifying bird species*"[11] in this case being the Mersey Estuary SPA and Ramsar site. For SPAs, this is typically defined as land within up to 20 km of a SPA that is regularly used by significant numbers of qualifying bird species specifically, areas supporting at least equal to or exceeding the SPA 1% threshold. The definition of FLL is exercised and applied cautiously throughout this document, as the definition of FLL is typically treated case by case in the absence of a universal or European site-specific definition. For the purposes of this HRA, the 1% SPA population general rule is applied for all wetland birds recorded within the Order

[11] Bowland Ecology 2021. Identification of Functionally Linked Land supporting SPA waterbirds in the North West of England. NERC361. Natural England

Limits as the basis for further consideration and the identification of mitigation requirements.

5.2 Desk Study Record Analysis

5.2.1 Extensive records of qualifying features were recovered from a range of sources, as detailed in **ES Vol 2 Appendix 8-1: Ornithology Survey Report [EN010153/DR/6.2].** Collectively, these desk study records provide a robust evidence base supporting the conclusion that the land within the Order Limits functions as established FLL to the Mersey Estuary SPA.

5.2.2 Parts of the Order Limits (Cells 1, 2, 3 and 5) are located within areas which Natural England identifies as having 'High Potential' to constitute FLL to the Mersey Estuary SPA, as set out in report NECR483 Edition 1 – 'Identification of Functionally Linked Land in the Northwest of England – Phase 2 (NECR483)'.[12] The report effectively identifies the Order Limits as FLL for the Northwest of England, establishing that certain areas have the potential to constitute FLL irrespective of field survey results. While some parts of the Order Limits fall outside the areas explicitly mapped as 'High Potential' within the NECR483 report, it is accepted that these areas may still support SPA qualifying features.

5.2.3 The Order Limits includes two British Trust for Ornithology (BTO) 'Core Count Sectors', encompassing the Frodsham Sludge Lagoons (BTO sector 45351) which covers some of the Western SADA (Cells 1, 2, 3, and 5 but extends beyond these areas to Cell 5 and Cell 6) and Weston Marshes (BTO sector 45424) which completely aligns with the Eastern SADA.

5.2.4 Both count sectors are categorised as "Very High Priority" for WeBS coordinated monthly counts. Additionally, the Order Limits include areas that are designated as non-statutory sites for nature conservation (Frodsham, Helsby and Ince Marshes Local Wildlife Site (LWS), Frodsham Field Studies Centre LWS and Easton Clifton

[12] *BOWLAND ECOLOGY. 2022. Identification of Functionally Link Land in the North West of England – Phase 2. NECR483. Natural England*

Tip LWS), in part due to the recorded presence of wetland bird species which are associated with the Mersey Estuary SPA.

5.2.5 BTO WeBS data for the Mersey Estuary SPA (2019-2024) confirms that five species have been recorded with peak counts exceeding 1,000 individuals, black-tailed godwit, lapwing, teal, golden plover, and dunlin with black-tailed godwit reaching a peak of 4,200 birds. These high counts were primarily recorded at Frodsham Sludge Lagoons sector (Cells 1, 2, 3, 6 and part of Cell 5 - discreet locations within the sectors are not provided); however, the large majority of records provided are likely to come from Cell 3 (the NBBMA) and Cell 6 which is outside the Order Limits. The high counts in Cell 6 are likely due to optimal habitats that support waterbirds including the large waterbody within the cell. Overall, Cell 6, and to some degree Cells 1, 2, 3 and part of Cell 5 consistently support a more abundant and diverse bird assemblage compared to the other areas within the Order Limits, i.e. the Western SADA and NBBMA consistently supports SPA birds in moderate to high numbers.

5.2.6 By contrast, the Eastern SADA located within Weston Marshes BTO sector supports notably lower maximum peak counts which were isolated, with lapwing peaking at 96 (1/52 survey counts; remaining counts were below 13 birds), teal at 66 (49/54 survey counts were below 20 birds) and black-tailed godwit peaking at 296 (1/53 survey counts with 51/53 all below 7 birds).

5.2.7 This pattern of differentiation between the Eastern and Western SADAs was also reflected in the non-breeding bird surveys undertaken by HyNet during 2021–2022[13] and 2024[14] highlighted in the **ES Vol 2 Appendix 8-1: Ornithology Survey Report [EN010153/DR/6.2].** Transect 6 and Transect 7b of the Hynet surveys, which formed part of the wider transect network completed by surveyors, overlapped with areas within the Frodsham Solar Order Limits. Hynet Transect 7b intersected the Eastern SADA and Transect 6 intersected the Western SADA (see Figure 5O.3).

5.2.8 Hynet survey data, collected between January and June 2024, indicated that SPA species did not exceed a peak count of eight individuals (teal being the highest

[13] HyNet North West (2022) Baseline Ornithology Report Winter 2021-22. Available at: HyNet North West.pdf) (Accessed: 2 May 2025).
[14] HyNet North West (2024) Non-breeding Waterbird Survey Interim Report. Unpublished report.

count), and no waterbirds were recorded after March 2024 (i.e. during spring passage) in both transect 6 and transect 7b. Comparable surveys completed by Hynet conducted over the same areas between October 2021 and February 2022 also recorded only low peak counts, limited to Cell 6 and the River Weaver. Note that the Hynet survey data for January to June 2024 has been included, as this area was not surveyed by the Applicant during this season, so has been included for completeness (Table 5-1).

Table 5-1 Supplementary information (Hynet Field surveys completed: January-June 2024). All records of species recorded within the Order Limits of Frodsham Solar during surveys for the Hynet Development.

Visit number	Month	Species	Field number	Count
Visit 5	February	Gadwall	37	2
Visit 5	February	Grey heron	29	1
Visit 6	March	Greylag	36	1
Visit 4	February	Kingfisher	35	1
Visit 5	February	Lapwing	36	1
Visit 5	February	Lapwing	31	4
Visit 6	March	Lapwing	32	4
Visit 3	January	Mallard	37	2
Visit 5	February	Mallard	37	2
Visit 5	February	Mallard	16	3
Visit 5	February	Mallard	30	1
Visit 5	February	Mallard	29	1
Visit 6	March	Mallard	36	2
Visit 6	March	Mallard	28	1
Visit 5	February	Mallard	16	2
Visit 6	March	Shelduck	16	1
Visit 6	March	Shelduck	31	1
Visit 5	February	Teal	37	8
Visit 6	March	Teal	36	4
Visit 7 onwards – no records				

5.2.9 Additional context is provided by data between 2015-2022 across the Mersey Estuary and the wider area obtained from the Cheshire and Wirral Ornithological Society (CAWOS), which recorded qualifying features and species that form part of the waterbird assemblage across the wider area surrounding the Order Limits. These records represent observations across the entire Mersey Estuary SPA, including adjacent areas, rather than being confined to the Order Limits. While the data are

casual and not location-specific, they offer supporting evidence of functional linkage within the wider landscape extending across the Mersey Estuary and adjacent areas for SPA species. All records are presented in **ES Vol 2 Appendix 8-1: Ornithology Survey Report [EN010153/DR/6.2]**.

5.2.10 The combined evidence, summarised above, demonstrates that Cells 1, 2, 3, 6 and part of Cell 5 (the Western SADA and NBBMA, noting Cell 6 lies outside the Order Limits) are utilised by greater numbers and more frequently by qualifying features and the waterbird assemblage of the Mersey Estuary, compared to the surrounding farmland areas which lie within the Eastern SADA. This pattern of utilisation indicates that the identified Cells are likely to function as FLL and represent higher quality habitat for SPA species. By contrast, land within the farmlands and other parts of the Eastern SADA are likely to be of sub-optimal quality for these bird species, based on the lesser and evident utilisation. Regardless, there are periodic records of use of the Eastern SADA by SPA species, meaning that the entire Order Limits is either clearly FLL, or has the potential to be FLL based on occasional use.

5.3 Field Survey Results Summary and Area Utilisation Within the Order Limits

5.3.1 Full survey results are presented in **ES Vol 2 Appendix 8-1: Ornithology Survey Report [EN010153/DR/6.2]**. It is important to note that the results shown in the figures within the **ES Vol 2 Appendix 8-1: Ornithology Survey Report [EN010153/DR/6.2]** are of multiple records recorded per month and are not discrete to one visit that month.

5.3.2 For transparency and to align with Natural England comment NE02 in its Relevant Representation (10 November 2025), the Applicant has re-presented the non-breeding results in a separate document for Natural England and provided part of these results below, however all data has been assessed based on the data tables presented in Annex 8-9 of ES: Vol 2 Appendix 8-1: Ornithological Survey Report [**EN010153/DR/6.2**]. Conclusions drawn from these data are based primarily on Years 2 and 3. Year 1 is included for context (e.g., high counts) where considered relevant, and it is considered that these results are helpful in the overall assessment.

5.3.3 Table 5-2 presents the maximum peak counts of all waterbird species recorded within the Order Limits across the three years of field surveys. Table 5-3 presents additional peak counts for species recorded outside the Order Limits. The 1% SPA population thresholds are shown in the tables as highlighted cells (data obtained from the BTO- Mersey Estuary SPA for 2019-2024 and provided in Appendix 1). For this data, the five-year WeBS monthly peak values have been compared against the field survey maximum peak counts to ensure that the importance of the Order Limits is not underestimated; therefore, averages across the three survey years have not been used. Average monthly peak counts were also calculated, but the difference between the BTO WeBS five-year monthly maximum counts and the five-year monthly averages was negligible and did not alter any conclusions regarding 1% threshold exceedances.

5.3.4 Table 5-3 provides additional context of the area outside of the Order Limits, specifically Cell 6, which supports high peak counts of wetland birds, per month.

Table 5-2: SPA species and waterbird assemblage species recorded across the entirety of the Order Limits during field surveys during Year 1, 2 and 3. Note, Year 1 Figures included for completeness and to illustrate additional peak counts. For the avoidance of doubt, assessment is largely made based on Year 2 and Year 3 Figures in accordance with Natural England comments. * Denotes species which 1% threshold benchmarks are not considered ornithologically meaningful i.e. 1 individual equates to exceeding the 1% SPA threshold and (or) is a likely under-recorded species due to either their behaviour or common and widespread/non-native nature across the UK. Orange highlighted cells indicate the Mersey Estuary SPA 1% threshold exceedance for monthly peak count (5-year).

Year	Species	September	October	November	December	January	February	March	April
1	Black-tailed godwit	26	0	0	0	5	0	0	0
1	Curlew	12	27	0	0	0	0	8	0
1	Gadwall*	0	0	0	0	0	3	0	2
1	Golden plover	0	0	0	0	0	0	9	0
1	Greylag goose*	0	0	0	0	0	2	4	0
1	Lapwing	0	159	0	50	0	0	3	4
1	Mallard*	0	0	0	0	3	0	5	4
1	Mute swan*	0	0	0	0	2	0	0	0
1	Oystercatcher	0	0	0	0	0	0	4	0
1	Pintail	0	0	0	0	0	0	2	0
1	Redshank	0	1	0	0	0	0	0	0
1	Shelduck	0	0	0	0	0	0	0	2
1	Shoveler*	0	0	0	0	0	0	2	1
1	Snipe*	0	1	0	4	0	0	2	0
1	Teal	0	4	0	17	52	52	35	24

Year	Species	September	October	November	December	January	February	March	April
2	Black-tailed godwit	2	0	0	0	8	74	1411	-
2	Curlew	46	36	31	4	56	90	27	-
2	Gadwall*	0	0	0	0	0	2	6	-
2	Golden plover	0	0	275	17	433	200	0	-
2	Great crested grebe*	0	0	1	0	0	0	0	-
2	Greylag goose*	0	0	8	0	0	6	7	-
2	Lapwing	0	0	280	400	800	463	0	-
2	Mallard*	5	43	9	13	0	41	42	-
2	Mute swan*	0	0	8	0	0	0	0	-
2	Oystercatcher	0	0	0	0	0	2	2	-
2	Pintail	0	0	0	0	0	5	4	-
2	Redshank	0	0	0	0	1	4 (48 Canal Pools)	0	-
2	Ruff*	0	0	0	0	0	10	0	-
2	Shelduck	0	0	0	10	1	2	11	-
2	Shoveler*	0	0	0	0	0	4	38	-
2	Snipe*	1	28	25	0	36	17	3	-
2	Teal	0	177	0 (56 Canal Pools)	9	114	291	235	-
2	Tufted duck	0	0	0	0	8	19	50	-
2	Whooper swan*	0	0	1	1	0	0	0	-
2	Wigeon	0	0	0	0	19	18	25	-
3	Black-tailed godwit	-	537	338	369	411	445	8	-
3	Curlew	-	36	41	24	37	37	13	-
3	Dunlin	-	0	9	0	0	0	0	-
3	Gadwall*	-	30	16	12	8	6	6	-
3	Golden plover	-	15	526	80	50	631	0	-
3	Great crested grebe*	-	0	0	0	0	0	2	-

Year	Species	September	October	November	December	January	February	March	April
3	Greylag goose*	-	0	4	0	7	11	10	-
3	Lapwing	-	410	1151	586	567	940	2	-
3	Little egret*	-	0	0	1	1	0	1	-
3	Mallard	-	73	72	50	15	27	18	-
3	Mute swan*	-	2	2	3	0	0	0	-
3	Oystercatcher	-	0	1	0	1	0	0	-
3	Pink-footed goose	-	0	0	0	0	0	131	-
3	Pintail	-	1	7	0	0	2	13	-
3	Redshank	-	1	0	9	6	6	0	-
3	Ringed plover	-	0	0	0	1	0	0	-
3	Ruff*	-	9	8	0	4	9	0	-
3	Shelduck	-	0	1	2	0	2	7	-
3	Shoveler*	-	42	77	45	23	30	30	-
3	Snipe*	-	40	25	29	89	24	45	
3	Teal	-	534	562	550	434	343	272	-
3	Tufted duck	-	0	8	8	0	19	9	-
3	Water rail*	-	1	0	1	0	0	0	
3	Wigeon	-	5	53	26	0	158	169	-

Table 5-3 – Peak Count Summary (Years 1–3: 2022–2025) – Areas Outside the Order Limits. Annual 5-year mean of peak 1% threshold applied.

The table below presents incidental (casual) peak counts recorded during field surveys and provide a snapshot of bird usage of land located outside the Order Limits.

Areas outside of the Order Limits	Year	Target Species							
		Lapwing 4570 (annual 5-year mean)	Golden plover 2036 (annual 5-year mean)	Curlew 1541 (annual 5-year mean)	Black-tailed godwit 3932 (annual 5-year mean)	Redshank 7057 (annual 5-year mean)	Pintail 203 (annual 5-year mean)	Wigeon 2078 (annual 5-year mean)	Teal 4312 (annual 5-year mean)
Cell 6	1	116	-	-	2,000	300	20	-	350
	2	-	200	59	260	14	10	12	359
	3	120	-	-	-	200	46	-	800
Frodsham Score	1	200	-	200	20	30	-	-	10
	2	-	-	-	-	-	-	-	-
	3	-	-	-	18	-	-	-	-
Manchester Ship Canal	1	-	-	-	-	80	-	-	45
	2	-	-	-	-	-	-	-	-

Areas outside of the Order Limits	Year	Target Species							
		Lapwing 4570 (annual 5-year mean)	Golden plover 2036 (annual 5-year mean)	Curlew 1541 (annual 5-year mean)	Black-tailed godwit 3932 (annual 5-year mean)	Redshank 7057 (annual 5-year mean)	Pintail 203 (annual 5-year mean)	Wigeon 2078 (annual 5-year mean)	Teal 4312 (annual 5-year mean)
	3	200	-	50	-	9	-	-	189
River Weaver	1	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-
	3	180	-	-	-	-	-	-	-

Mersey Estuary SPA: Qualifying Feature Summary

5.3.5 As shown in Table 5-2, several species recorded across the Order Limits exhibit clear peak counts, including those individually listed as qualifying features of the Mersey Estuary SPA and Ramsar site. Qualifying species recorded comprise teal, shelduck, pintail, golden plover, black-tailed godwit, redshank, and dunlin.

5.3.6 Across the three-year survey period, teal exceeded the 1% threshold during every non-breeding season. Shelduck did not exceed the 1% threshold in any year. Pintail also exceeded the 1% threshold in each non-breeding season; however, the timing of exceedance (i.e., the specific month) varied between years. Golden plover exceeded the 1% threshold consistently during the core non-breeding bird period (November–February, inclusive)[xv] across all survey years. Redshank exceeded the 1% threshold on one isolated occasion, during Year 2 in February. Dunlin did not exceed the 1% threshold at any point during the three-year period. Black-tailed Godwit exceeded the threshold in late winter to early spring in Year 2 and exceeded the 1% threshold in every month between October and March during Year 3.

5.3.7 No other qualifying features (species) were recorded within the Order Limits.

Mersey Estuary SPA: Waterbird Assemblage

5.3.8 Other species considered important under the BTO WeBS data for the Mersey Estuary SPA and Ramsar site are those that regularly support numbers meeting or exceeding national or international importance thresholds (≥ 100 % of the five-winter mean). These include pink-footed goose (one isolated 1% exceedance during March, year 3), shoveler and little egret. The latter two species exceeded the 1% threshold during the survey period. For shoveler, little egret, gadwall and mallard, the 1% thresholds equate to very small absolute counts (c. 0.5–3.5 birds). Apparent ‘exceedances’ at these levels are not considered ecologically meaningful and likely reflect detectability/commonness rather than functional reliance. However, these species are included as part of the screening process on a precautionary basis.

[xv] *The core non-breeding bird season (also referred to interchangeably as the core non-breeding bird period) is considered to be November – February inclusive, which aligns with English guidance on bird survey definitions as per Bird Survey & Assessment Steering Group. (2025).*

5.3.9 Similar to golden plover, lapwing exceeded the 1% threshold largely during the core non-breeding period, however there was one isolated peak during October in year 3. Lapwing was regularly recorded in relatively high numbers. Lapwing is not considered internationally important to the European site throughout any season according to the BTO Mersey Estuary SPA WeBS data. Lapwing approximately contributes up to 74% of the national threshold and 23% of the international threshold within the Mersey Estuary SPA.

5.3.10 Wigeon are also considered part of the waterbird assemblage due to their regularity within the Mersey Estuary SPA. Like lapwing, this species is not considered important (46% of the national threshold and 15% of the international threshold). Wigeon exceeded the 1% threshold largely during late winter, early spring.

5.3.11 Within the Order Limits, peak counts of these species are spatially skewed and, in some cases are concentrated in discrete areas within the Order Limits, which is important to note as part of the overall assessment and the HRA process.

5.3.12 The subsequent subsections discuss the distribution of qualifying features and other important assemblage species defined by the BTO and compare the field results to the BTO WeBS data alongside different compartments of the Order Limits, i.e. the Western SADA (cells 1, 2 and 5), the Eastern SADA and Cell 3/the NBBMA.

5.3.13 For clarity, the NBBMA incorporates all of Cell 3 and part of Cell 2, however for the purposes of this document the counts and usage patterns within each cell are described and presented independently to maintain consistency in interpreting survey data. No records from within Cell 2 have been merged with Cell 3/the NBBMA results, as part of Cell 2 will be developed.

5.3.14 Note that the following BTO WeBS sectors have been included as part of the assessment and for avoidance of doubt these sectors cover the following areas within the Order Limits:

i) Frodsham Sludge Lagoons (FSL) - overlaps with cells 1, 2, 5 and 3 within the Western SADA. However, it also covers Cell 6 (Table 4-3) and Cell 4 which are located outside of the Order Limits.
ii) Weston Marshes – covers the entirety of the Eastern SADA.

Golden plover (Qualifying Species)

5.3.15 Golden Plover show clear winter use (November–February) within the Western SADA and Cell 3 (NBBMA), with negligible activity recorded during passage periods.

5.3.16 The species is regularly associated with Cell 3, which supported the largest flocks, frequently exceeding the 1% Mersey Estuary SPA threshold and including a maximum peak of 631 individuals (42% of the SPA population) in November. Cell 2 also contributes to the overall total in several winter months (e.g. December–February), however the trend of utilisation particularly between year 2 and 3 is inconsistent. Cells 1 and 5 show minimal or no utilisation. Overall, field survey data collected by Avian Ecology Limited (AEL) indicate that exceedances occur in up to four winter months, largely driven by concentrations in Cell 3 (Table 5-5).

5.3.17 Comparison of the FSL BTO WeBS data (which partially overlap Cells 1, 2, 3, and 5 of the Western SADA) indicates that golden plover use is inconsistent and opportunistic, characterised by extended periods of absence interspersed with occasional large influxes. This pattern results in the low five-year mean counts presented in Table 5-4. below. In contrast, WeBS data for the Mersey Estuary SPA show regular winter presence (November–January) and lower inter-annual variability during the winter period (CV 54–107%), confirming the SPA's role as the primary core area for the species (Table 5-4).

5.3.18 Golden plover were not recorded within the Eastern SADA.

Table 5-4. Inter-Annual Variability in Monthly Waterbird Counts: Comparative Coefficient of Variation (CV) Dataset.

Month	CV% of counts collected per month between 2019 to 2024 FSL (Western SADA) and range of raw counts	CV% of counts collected per month between 2019 to 2024 Mersey Estuary SPA
January	90% (0-1045)	54% (613-3132)
February	93% (0-411)	70% (200-1500)

March	86% (0-550)	62% (0-971)
April	All counts 0	145% (0-331)
September	173% (0-1)	172% (0-137)
October	124% (0-350)	95% (150-1981)
November	All counts 0	79% (8-1116)
December	173% (0-909)	107% (0-1158)

Table 5-5. Peak counts across the Order Limits broken down by Western SADA, Eastern SADA and Cell 3 (NBBMA). Note that all data presented for Cell 3, do not include the encroachment of the NBBMA design which partially includes Cell 2. All data recorded in isolation to Cell 2 are recorded.

Golden plover				AEL 22-23 (Year 1)					AEL 23-24 (Year 2)					AEL 24-25 (Year 3)				
Month	1% threshold of the WeBS SPA 5YM	Frodsham Sludge Lagoons 5-year monthly peak count (Part of the Western SADA)	Weston Marshes 5-year monthly peak count (full coverage of the Eastern SADA)	Western SADA					Western SADA					Western SADA				
				Cell 1 (C1)	Cell 2 (C2)	Cell 5 (C5)	Cell 3 (C3)	Eastern SADA	Cell 1	Cell 2	Cell 5	Cell 3	Eastern SADA	Cell 1	Cell 2	Cell 5	Cell3	Eastern SADA
Sept	1.37	1	0	0	0	0	-	0	0	0	0	0	-	-	-	-	-	-
October	19.81	350	0	0	0	0	-	0	0	0	0	0	-	0	0	0	15 (<1%)	0
Nov	11.16	0	0	0	0	0	-	0	34 (3%)	0	0	275 (24%)	-	0	60 (5%)	0	526 (47%)	0
Dec	11.58	908	0	0	0	0	-	0	0	17 (1%)	0	0	-	0	0	0	80 (6%)	0
Jan	31.32	1045	0	0	0	0	-	0	37 (1%)	100 (3%)	0	433 (14%)	-	23 (<1%)	0	0	50 (2%)	0
February	15	411	0	0	0	0	-	0	0	200 (13%)	0	200 (13%)	-	0	38 (2.4%)	0	631 (42%)	0
March	9.17	550	0	0	9 (1%)	0	-	0	0	0	0	0	-	0	0	0	0	0
April	3.31	0	0	0	0	0		0	-	-	-	-	-	-	-	-	-	-

Black-tailed godwit (Qualifying Species)

5.3.19 Black-tailed godwit were recorded almost exclusively within Cell 3 and the Canal Pools area, with very limited activity elsewhere within the Western and Eastern SADA.

5.3.20 In Year 2, counts increased markedly in March (1,411 birds; 24% of the SPA 5-year mean and February (74 birds; 2%), while in Year 3 substantial peaks occurred in October (537 birds; 11 %), November (338 birds; 18%), December (369 birds ;34 %) and January (411 birds; 11 %), with smaller numbers persisting through late winter. These fluctuations indicate that, whilst Cell 3 can periodically attract large flocks, such events are episodic and short-lived rather than reflective of consistent reliance on the Order Limits. It is possible these records are overspill from Cell 6, which is a well-established core area for this species (Table 5-7).

5.3.21 The FSL WeBS five-year mean (which partially overlap Cells 1, 2, 3, and 5 of the Western SADA) ranged between 151–3,885 birds (which also includes Cell 6, which is the likely driver of larger peaks), shows similarly high variance as to what was observed during baseline field surveys, whereas the Mersey Estuary SPA appears to support more stable and predictable wintering populations (Table 6-6). Collectively, these results suggest that the Western SADA, particularly Cell 3, functions as a supplementary or opportunistic high-tide or foraging refuge used intermittently by godwits displaced or commuting from the SPA and Cell 6, rather than as a regularly occupied core area.

5.3.22 Analysis of inter-annual variability (Table 5-6) shows that the Western SADA exhibits extremely high coefficients of variation for black-tailed godwit (e.g. 124–217% in winter months), far exceeding those of the Mersey Estuary SPA (49%-138%). This inflated variability demonstrates that use of the Western SADA, particularly Cell 3 is inherently inconsistent and driven by opportunistic, hydrology-dependent overspill from the SPA rather than by sustained functional reliance. The SPA itself shows lower and more stable variability, indicating it remains the primary core resource, while the Western SADA functions as an intermittent refuge only, possibly during favourable conditions.

Table 5-6. Inter-Annual Variability in Monthly Waterbird Counts: Comparative Coefficient of Variation Dataset

Month	Data collected per month between 2019 to 2024 FSL (Western SADA)	Data collected per month between 2019 to 2024 Mersey Estuary SPA
January	124% (6-667)	87% (32-3652)
February	177% (0-1500)	138% (1-3323)
March	81% (0-2109)	74% (873-5975)
April	73% (453-2000)	49% (1446-4929)
September	67% (400-3885)	73% (546-5138)
October	76% (0-2500)	88% (12-4739)
November	217% (0-1597)	106% (100-1860)
December	174% (0-151)	116% (19-1072)

Table 5-7. Peak counts across the Order Limits broken down by Western SADA, Eastern SADA and cel 3 (NBBMA). Note that all data presented for cell 3, do not include the encroachment of the NBBMA design which partially includes cell 2. All data recorded in Cell 2, are confined to Cell 2.

Black-tailed godwit				AEL 22-23 (Year 1)					AEL 23-24 (Year 2)					AEL 24-25 (Year 3)				
				Western SADA					Western SADA					Western SADA				
Month	1% threshold of the WeBS SPA 5YM	Frodsham Sludge Lagoons 5-year monthly peak count (Part of the Western SADA)	Weston Marshes 5-year monthly peak count (full coverage of the Eastern SADA)	Cell 1 (C1)	Cell 2 (C2)	Cell 5 (C5)	Cell 3 (C3)	Eastern SADA	Cell 1	Cell 2	Cell 5	Cell 3	Eastern SADA	Cell 1	Cell 2	Cell 5	Cell3	Eastern SADA
Sept	51.38	3885	44	26 (<1%)	0	0	-	26 (<1%)	0	0	0	2	-					
Oct	47.38	2500	0	0	0	0	-	1(<1%)	0	0	0	0	-	0	0	0	537 (11%)	0
Nov	18.60	1597	0	0	0	0	-	0	0	0	0	0	-	0	0	57 (3%)	338 (18%)	18 (<1%)
Dec	10.72	151	0	0	0	0	-	0	0	0	0	0	-	0	0	0	369 (34%)	0
Jan	36.52	667	0	0	0	0	-	5 (<1%)	8(<1%)	0	0	0	-	0	0	0	411 (11%)	0
Feb	33.23	1500	0	0	0	0	-	0	0	0	0	74 (2%)	-	0	102 (3%)	0	445 (13%)	5(<1%)
Mar	59.75	2109	1	0	0	0	-	0	0	0	0	1411 (24%)	-	0	0	0	8(<1%)	3(<1%)
April	49.29	2000	7	0	0	0	-	0	-	-	-	-	-	-	-	-	-	-

Pintail (Qualifying Species)

5.3.23 Pintail were recorded infrequently but with occasional exceedances of the 1 % Mersey Estuary SPA threshold, primarily within Cell 3 / the Canal Pools and, to a lesser extent, at the Lum Pool within the Eastern SADA. Overall use of the Order Limits is low and irregular, with records scattered across the non-breeding season (Table 5-8).

5.3.24 Within the Western SADA, pintail were largely restricted to Cell 3, where counts ranged from single figures to modest peaks of 5 birds (5 % of SPA) in February and 13 birds (22%; not the 1% threshold for the Mersey SPA is 0.6 birds) in March. The species was largely absent from Cells 1, 2 and 5 throughout all survey years, reflecting the lack of suitable wetland habitat. WeBS five-year averages (10–33 birds) indicate small but persistent winter use, although variability between months and years is high.

5.3.25 In the Eastern SADA, the BTO WeBS data for Weston Marshes (cover the entirety of the Western SADA) show pintail on only one record (three birds in March 2024) throughout the 5 years of counts (2019-2024). Field surveys recorded seven birds in November 2024 on the Lum and two birds in March 2023, the latter subsequently confirmed to have been in Cell 1- likely a rare record as wetland habitat does not exist within this area. The Lum record exceeds the 1% SPA threshold but represents isolated use of a small, retained waterbody rather than sustained occupancy.

5.3.26 Across both the Eastern and Western SADAs, pintail occurrence is episodic and confined to discrete wetland features, notably Cell 3 and the Lum. The data indicate opportunistic foraging or roosting under favourable hydrological conditions, with no evidence of regular or extensive use elsewhere. However, Cell 6 (Table 5-8) holds much higher counts which is likely to indicate greater conditions and carrying capacity. The NBBMA wet features, the Lum area and the small transient pool within Cell 2 will be retained and enhanced as the Proposed Development, ensuring that the supporting function they provide is maintained and enhanced.

Table 5-8. Peak counts across the Order Limits broken down by Western SADA, Eastern SADA and cel 3 (NBBMA). Note that all data presented for cell 3, do not include the encroachment of the NBBMA design which partially includes cell 2. All data recorded in Cell 2, are confined to Cell 2.

Pintail				AEL 22-23 (Year 1)					AEL 23-24 (Year 2)					AEL 24-25 (Year 3)				
				Western SADA					Western SADA					Western SADA				
Month	1% threshold of the WeBS SPA 5YM	Frodsham Sludge Lagoons 5-year monthly peak count (Part of the Western SADA)	Weston Marshes 5-year monthly peak count (full coverage of the Eastern SADA)	Cell 1 (C1)	Cell 2 (C2)	Cell 5 (C5)	Cell 3 (C3)	Eastern SADA	Cell 1	Cell 2	Cell 5	Cell 3	Eastern SADA	Cell 1	Cell 2	Cell 5	Cell3	Eastern SADA
Sept	0.67	67	0	0	0	0	-	0	0	0	0	0	-					
Oct	4.16	39	0	0	0	0	-	0	0	0	0	0	-	0	0	0	1 (<1%)	0
Nov	0.9	23	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	7 (8%)
Dec	0.74	36	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0
Jan	1.6	19	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0
Feb	1	58	0	0	0	0	-	0	0	0	0	5 (5%)	-	0	0	0	2 (2%)	2 (2%)
March	0.6	25	3	2 (3%)	0	0	-	0	0	0	0	4 (3%)	-	0	0	0	13 (22%)	0
April	0.11	7	0	0	0	0	-	0	-	-	-	-	-	-	-	-	-	-

Redshank (Qualifying Species)

5.3.27 Redshank occur at very low levels across all survey years, with most counts equating to <1 % of the SPA threshold (Table 5-9). A single February peak (48 individuals; 2 % of the SPA threshold) within Cell 3 represents the only meaningful increase. Birds recorded likely represent occasional tidal roost spillover or local foraging movements from the Mersey Estuary SPA (mudflats).

5.3.28 There was one record in the Eastern SADA of one bird, which was recorded within the Lum.

Table 5-9. Peak counts across the Order Limits broken down by Western SADA, Eastern SADA and cel 3 (NBBMA). Note that all data presented for cell 3, do not include the encroachment of the NBBMA design which partially includes cell 2. All data recorded in Cell 2, are confined to Cell 2.

				AEL 22-23 (Year 1)					AEL 23-24 (Year 2)					AEL 24-25 (Year 1)				
				Western SADA					Western SADA					Western SADA				
Month	1% threshold of the WeBS SPA 5YM	Frodsham Sludge Lagoons 5-year monthly peak count	Weston Marshes 5-year monthly peak count	Cell 1 (C1)	Cell 2 (C2)	Cell 5 (C5)	Cell 3 (C3)	Eastern SADA	Cell 1	Cell 2	Cell 5	Cell 3	Eastern SADA	Cell 1	Cell 2	Cell 5	Cell3	Eastern SADA
Sept	74.98	67	1	0	0	0	-	0	0	0	0	0	-	-	-	-	-	-
Oct	40.11	39	0	0	0	0	-	1	0	0	0	0	-	0	0	0	1	0
Nov	128.96	23	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0
Dec	51.4	36	0	0	0	0	-	0	0	0	0	0	-	0	9 (<1%)	0	0	2
Jan	50.55	19	3	0	0	0	-	0	0	0	0	1	-	0	2	0	0	6 (<1%)
Feb	31.36	58	2	0	0	0	-	0	0	4 (<1%)	0	48 (2%)	-	0	0	0	6 (<1%)	1
March	82.25	25	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0
April	30.40	7	1	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-

Teal (Qualifying Species)

5.3.29 Teal exceeded the 1% SPA threshold on several occasions across the survey period, but all exceedances were restricted to the Lum and ditch networks within the Eastern SADA or Cell 3 and the ditch networks within the Western SADA, and so, species were contained wetland features that will be retained and enhanced as part of the Proposed Development design (Table 5-10). The Eastern SADA otherwise held negligible numbers, with Weston Marshes WeBS data (which aligns with the Eastern SADA) showing only sporadic non-zero months. However, there was one isolated threshold exceedance within Cell 5 and Cell 2, however these were not recorded regularly and as above, were associated with the ditches and the small seasonally transient pool within Cell 2 throughout the Order Limits.

5.3.30 Within the Western SADA, Cell 3 consistently supported the only meaningful teal numbers (up to 24% of the SPA total), while Cells 1, 2 and 5 showed no regular utilisation, reflecting the absence of wet features. Teal presence is therefore highly seasonal, hydrology-driven and spatially confined, indicating that Cell 3 functions as an opportunistic wetland refuge.

Table 5-10. Peak counts across the Order Limits broken down by Western SADA, Eastern SADA and cel 3 (NBBMA). Note that all data presented for cell 3, do not include the encroachment of the NBBMA design which partially includes cell 2. All data recorded in Cell 2, are confined to Cell 2.

Teal				AEL 22-23 (Year 1)					AEL 23-24 (Year 2)					AEL 24-25 (Year 3)				
				Western SADA					Western SADA					Western SADA				
Month	1% threshold of the WeBS SPA 5YM	Frodsham Sludge Lagoons 5-year monthly peak count (Part of the Western SADA)	Weston Marshes 5-year monthly peak count (full coverage of the Eastern SADA)	Cell 1 (C1)	Cell 2 (C2)	Cell 5 (C5)	Cell 3 (C3)	Eastern SADA	Cell 1	Cell 2	Cell 5	Cell 3	Eastern SADA	Cell 1	Cell 2	Cell 5	Cell3	Eastern SADA
Sept	12.9	475	56	0	0	0	-	0	0	0	0	0	-	-	-	-	-	-
Oct	25.98	990	1	0	0	0	-	4 (<1%)	0	0	0	177 (7%)	-	0	0	0	534 (21%)	0
Nov	32.42	743	1	0	0	0	-	0	0	0	0	56 (2%)	-	0	0	0	562 (17%)	92 (3%)
Dec	27.17	563	0	0	0	0	-	17 (<1%)	0	0	0	0	-	0	0	0	550 (20%)	0
Jan	81.54	1013	0	0	0	0	-	52 (<1%)	0	0	0	114 (3%)	-	0	0	20 (<1%)	434 (5%)	8 (<1%)
Feb	31.33	756	10	0	0	0	-	52 (2%)	0	50(2%)	3 (<1%)	291 (9%)	-	0	0	6 (<1%)	343 (11%)	60 (2%)
March	11.51	350	66	0	0	5	-	35 (3%)	0	0	6 (<1%)	235 (20%)	-	0	8 (<1%)	53 (5%)	272 (24%)	45 (4%)
April	3.99	217	28	0	0	0	-	24 (6%)	-	-	-	-	-	-	-	-	-	-

Lapwing (Assemblage Species)

5.3.31 Data from the BTO Weston Marshes WeBS (covers the entirety of the Eastern SADA) count sector data and baseline field surveys indicates that the Eastern SADA consistently supports negligible numbers of lapwing during the non-breeding period; very low numbers, and largely well below the 1% threshold, were recoded across the three years of survey, particularly during Year 3. However it is acknowledged that there is some use of the Eastern SADA by this species.

5.3.32 Field surveys confirmed Cell 3 as the primary area used by lapwing within the Order Limits, although use fluctuates annually. Cells 1, 2, and 5 showed lower and inconsistent numbers, often <1% of the threshold meaning they are less valuable or more opportunistically used, which is particularly evident during the Year 3 surveys.

5.3.33 Further analysis of Western SADA and NBBMA data shows that:

i) In Cell 5, there were no 1% threshold exceedances throughout the three years of surveys;
ii) Data from Cell 2 showed that during the core non-breeding bird period, the 1% threshold was exceeded throughout during Year 2. This pattern was not mirrored during Year 3, whereby the 1% was exceeded on just two occasions (November 2024 and February 2025).
iii) Cell 1 showed similar patterns to Cell 2, where there were inconsistent patterns of the 1% threshold exceedance throughout the non-breeding period.
iv) Cell 3 did show a strong correlation with the 1% threshold exceedance, largely throughout the core non-breeding bird period.

5.3.34 Analysis of the BTO FSL WeBS data, which partially covers the Western SADA shows very high inter-annual and seasonal variation in lapwing numbers. Coefficients of variation (CV) were calculated using five-year monthly peak count data to quantify fluctuations in abundance per month (Table 5-12). For example, January counts between 2020 and 2024 ranged from 324 to 1,890 birds, giving a CV of 71 %, indicating marked variability between years, whereas the Mersey Estuary SPA CV was 31% for January, which indicates a more stable and consistent population. For the Eastern SADA, data was insufficient showing that there were not enough counts to make a meaningful comparison (i.e. largely absent).

5.3.35 Autumn and spring passage data showed a consistent pattern of 1% threshold exceedances during March and September within the cells listed above for the Western SADA, as well as within Cell 3 during the HyNet field surveys.

5.3.36 Review of the WeBS survey data for the passage period at Weston Marshes (Eastern SADA) and FSL (which partially overlaps the Western SADA) indicates that the 1% threshold was regularly exceeded during March, but only within the FSL (Western SADA) sector. This is consistent with the exceedances observed in Cell 3 (Table 5-11).

5.3.37 It is important to note that the HyNet field surveys recorded very low numbers of lapwing which were confined to cell 3 and 6 (4-14 individuals maximum) during April. However, it is difficult to distinguish whether these numbers relate to the breeding season, as the numbers increase three-fold during May (43 birds) when breeding would be expected to have commenced.

Table 5-11. threshold exceedances during the passage period for lapwing based on the 2019-2024 WeBS data

Site	Mar	Apr	Sep	Oct
Frodsham Sludge Lagoons (Western SADA)	5/5	4/5	4/4	3/5
Weston Marshes (Eastern SADA)	1/4	4/4	1/5	0/4

Table 5-12 Inter-Annual Variability in Monthly Waterbird Counts: Comparative Coefficient of Variation Dataset.

Month	Frodsham Sludge Lagoons CV%	Weston Marshes CV%	Mersey Estuary SPA CV%
January	71.3%	N/A	31.0%
February	88.3%	N/A	78.0%
March	81.2%	73.4%	61.4%
April	73.9%	44.7%	52.9%
May	N/A	N/A	N/A
June	N/A	N/A	N/A
July	N/A	N/A	N/A
August	N/A	N/A	N/A
September	36.5%	127.4%	33.6%
October	114.8%	N/A	42.1%
November	137.3%	N/A	50.1%
December	145.3%	N/A	60.2%

Table 5-13 Peak counts across the Order Limits broken down by Western SADA, Eastern SADA and cel 3 (NBBMA). Note that all data presented for cell 3, do not include the encroachment of the NBBMA design which partially includes cell 2. All data recorded in Cell 2, are confined to Cell 2.

Lapwing				AEL 22-23 (Year 1)					AEL 23-24 (Year 2)					AEL 24-25 (Year 3)				
				Western SADA					Western SADA					Western SADA				
Month	1% threshold of the WeBS SPA 5YM	FSL 5-year monthly peak (Part of the Western SADA)	Weston Marshes 5-year monthly peak (full coverage of the Eastern SADA)	Cell 1 (C1)	Cell 2 (C2)	Cell 5 (C5)	Cell 3 (C3)	Eastern SADA	Cell 1	Cell 2	Cell 5	Cell 3	Eastern SADA	Cell 1	Cell 2	Cell 5	Cell3	Eastern SADA
Sept	12.84	325	96	0	0	0		0	0	0	0	0	-	-	-	-	-	-
Oct	37.34	745	0	159 (4%)	0	0		0	0	0	0	0	-	3 (<1%)	0	0	410 (16%)	3 (<1%)
Nov	50.56	500	0	0	0	0		0	280 (6%)	144 (3%)	0	150 (3%)	-	0	200 (4%)	4 (<1%)	1151 (23%)	28 (<1%)
Dec	46.24	2359	0	50 (1%)	0	0		1 (<1%)	20 <1%)	40 (1%)	0	400 (9%)	-	6	24 (<1%)	0	586 (13%)	0
Jan	62.02	1890	0	0	0	0		0	118 (2%)	245 (4%)	5 (<1%)	800 (13%)	-	180 (3%)	45 (<1%)	12 (<1%)	567 (9%)	40 (<1%)
Feb	51.21	1000	7	0	0	0		0	0	450 (9%)	0	463 (9%)	-	20 (<1%)	111 (2%)	1 (<1%)	940 (18%)	4 (<1%)
March	6.38	501	8	2(<1%)	0	0		3(<1%)	0	0	0	0	-	0	2 (<1%)	0	2 (<1%)	0
Apr	1.91	14	13	0	0	0		4		-	-	-	-	-	-	-	-	-

Curlew (Assemblage Species)

5.3.38 Curlew were recorded exclusively within the Western SADA, with no observations from the Eastern SADA during any survey year. This corresponds with the WeBS data for Weston Marshes, which covers the entirety of the Eastern SADA.

5.3.39 Records were sporadic and largely confined to Cell 3, however Cell 2 showed exceedances of the 1% during both Year 1 and Year 2, with one isolated peak of 90 individuals (11% of the Mersey Estuary SPA) during February, which could be associated with the small seasonally, transient pool in Cell 2 (i.e. softer soils) (Table 5-14).

5.3.40 This species is not individually listed as part of the qualifying species for the Mersey Estuary SPA and Ramsar; however, it is considered important during the autumn passage period according to the most recent available WebS Mersey Estuary SPA data, whereby the autumn percentage of the national threshold is 160%, whereas spring passage holds 55% of the national threshold, which is not reflected in the field survey data.

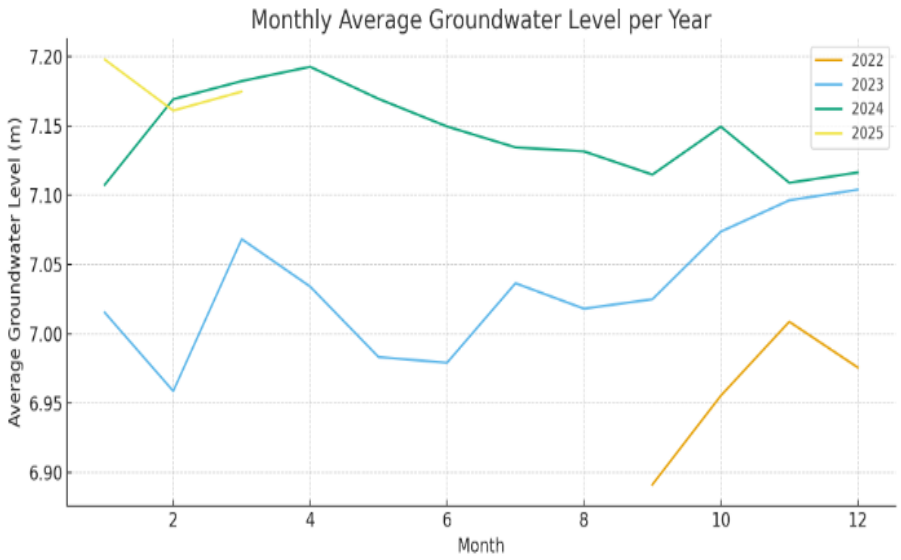
5.3.41 Analysis of the long-term WeBS data for FSL (which partially overlaps Cells 1,2,3 and 5), shows that curlew occur sporadically, with pronounced inter-annual variability and peak counts restricted to late winter (January–March). This mirrors the pattern recorded within the Western SADA, where small flocks (typically ≤ 11 % of the SPA threshold) were observed only in winter months. Both the field and WeBS data indicate opportunistic inland foraging under specific tidal or weather conditions rather than sustained use.

5.3.42 Groundwater level monitoring[xvi] indicates that water tables during 2024 were notably higher than in 2023, resulting in more extensive and persistent wet ground conditions across Frodsham Marshes. Comparison with curlew field data shows that curlew presence became more consistent in 2023–24 and particularly in 2024–25, with birds recorded in greater numbers and across a wider range of cells (maximum count 90 during February 2024; ground water is higher). This pattern suggests that higher

[xvi] *Environment Agency (n.d.) Hydrology station b6a9cd9d-5287-47bc-9426-fef516e651d0. Available at: https://environment.data.gov.uk/hydrology/station/b6a9cd9d-5287-47bc-9426-fef516e651d0 (Accessed: 14 November 2025).*

groundwater levels and associated softer soil conditions (as will be provided under the oNBBMS), enhance the suitability of the Western SADA for foraging Curlew, supporting more stable non-breeding use. The absence of curlew from the Eastern SADA is likely driven by habitat differences: the Western SADA is dominated by neutral grassland, whereas the Eastern SADA is arable (cereal crops). This is consistent with published evidence that wintering Curlew preferentially use soft, moist soils with high invertebrate availability, conditions more typical of wet grassland than arable land (Plate 5-1).[xvii]

Plate 5-1: Monthly average groundwater level per year- Frodsham marshes



xvii

Table 5-14. Peak counts across the Order Limits broken down by Western SADA, Eastern SADA and cel 3 (NBBMA). Note that all data presented for cell 3, do not include the encroachment of the NBBMA design which partially includes cell 2. All data recorded in Cell 2, are confined to Cell 2.

Curlew				Year 1					Year 2					Year 3				
Month	Mersey SPA 1% monthly Threshold	Frodsham Sludge Lagoons 5-year monthly peak count (Part of the Western SADA)	Weston Marshes 5-year monthly peak count (full coverage of the Eastern SADA)	Cell 1 (C1)	Cell 2 (C2)	Cell 5 (C5)	Cell 3 (C3)	Eastern SADA	Cell 1	Cell 2	Cell 5	Cell 3	Eastern SADA	Cell 1	Cell 2	Cell 5	Cell3	Eastern SADA
Sept	19.15	2	0	9(<1%)	12 (<1%)	6 (<1%)	-	0	0	0	0	46 (2%)	-	-	-	-	-	-
Oct	11.83	322	0	3	27 (2%)	22 (2%)	-	0	6 (<1%)	0	0	36 (3%)	-	28 (2%)	36 (3%)	0	18 (2%)	0
Nov	13.42	100	0	0	0	0	-	0	4 (<1%)	31 (2%)	0	4 (<1%)	-	6 (<1%)	28 (2%)	0	41 (3%)	0
Dec	11.86	208	0	0	0	0	-	0	0	2 (<1%)	0	4 (<1%)	-	0	24 (2%)	0	19 (2%)	0
Jan	12.02	200	0	0	0	0	-	0	0	56 (5%)	0	0	-	37 (3%)	37 (4%)	0	0	0
Feb	8.50	210	0	0	0	0	-	0	70 (8%)	90 (11%)	0	59 (7%)	-	13 (1%)	37 (2%)	0	18 (2%)	0
March	6.8	121	0	0	8 (1%)	0	-	0	0	17 (3%)	0	27 (4%)	-	11 (2%)	0	0	13 (2%)	0
April	8.5	29	0	0	0	0	-	0	-	-	-	-	-	-	-	-	-	-

Wigeon (Assemblage Species)

5.3.43 Wigeon BTO WeBS 5-year counts for the Mersey Estuary SPA exceeds 1,200 birds in November–January, peaking at >2,200 in January.

5.3.44 By contrast, use of FSL/Western SADA is very limited. The FSL WeBS 5-year mean (which partially covers cells 1,2, 3 and 5) does not exceed 75 birds in any month, representing typically <3% of the overall SPA population. Across the AEL field data (2023–2025), wigeon were only recorded in small to moderate numbers, entirely confined to Cell 3 (Canal Pools), with the highest counts being 158 in February 2025 (17% of SPA) and 169 in March 2025 (7% of SPA). Wigeon were not recorded anywhere else within the Order Limits (Table 5-15).

Table 5-15. Peak counts of wigeon recorded during the three years of survey. Note that there were no records during Year 1, so this year has not been included.

Month	Mersey SPA WeBS monthly 5-year peak 1% threshold	Cell 3 (Year 2)	Cell 3 (year 3)
September	2.28	0	0
October	12.125	0	5
November	15.22	0	53
December	13.09	0	26
January	47.51	19	0
February	9.12	18	158
March	24.31	25	169
April	0.37	0	0

Other Assemblage species

5.3.45 Additional data is provided in Appendix 3, covering all species except shelduck, which did not exceed the 1% threshold at any point.

Shelduck

5.3.46 Shelduck use of the Eastern and Western SADA and Cell 3 (NBBMA) is very limited outside the breeding season, with only small numbers present across autumn and winter. Counts remained consistently below the 1% SPA threshold (monthly 1% threshold range 19.6-32.2 (Table 5-2) birds during the non-breeding period), with no significant concentrations in any cell. Overall, Cell 3 and the Western SADA is of low importance for this species.

Gadwall

5.3.47 Gadwall exceeded the 1% threshold on two occasions in the Eastern SADA, with counts of three birds in February Year 1 and four birds in February Year 3. Most observations of this species were recorded in Cell 3 (Western SADA), generally in low numbers, although there was a single peak count of 30 birds in Year 3 (Table 5-2).

5.3.48 The Mersey Estuary SPA 1% threshold is very low (between 0.036 and 1.3 birds), meaning that even single records can exceed some monthly thresholds. Gadwall is a common and widespread species, with its population increasing by 62% between 1997 and 2022 and its range expanding by 90.3%.[xviii]

5.3.49 Further, gadwall are not considered an important species with regards to their presence within the Mersey Estuary SPA, the BTO WeBS data suggest that 36% of the national threshold and 8% of the international threshold are supported by the area.

[xviii] *British Trust for Ornithology (BTO). (n.d.). Gadwall. Available at: https://www.bto.org/learn/about-birds/birdfacts/gadwall (Accessed: 18 November 2025).*

Shoveler

5.3.50 Within the Eastern SADA, shoveler exceeded the 1% threshold on one occasion (2 birds in November, Year 3). The SPA threshold for this species is very low (~1 bird), so the exceedance is not considered ecologically meaningful.

5.3.51 Regular utilisation of Cell 3 was recorded, with peak counts of 77 in November and 45 in December, alongside smaller flocks recorded during January and March. However, it is important to note that this is only truly visible during Year 3 of the surveys (Table 5-2).

5.3.52 Shoveler are considered an important national (141%) and international (36%) species of the Mersey Estuary SPA. This species has seen a 71% increase in population between 1997 and 2022 and 40.2% expansion in its range.[xix]

Mallard

5.3.53 In the Eastern SADA, the 1% Mersey Estuary SPA threshold was exceeded only once, with five individuals recorded in March of Year 1 and twice in Year 3.

5.3.54 In the Western SADA, repeated records were made within Cell 3, largely around the Canal Pools, with a peak count of 73 in October and 72 in November, and smaller numbers in wither.

5.3.55 Mallard is a common and widespread species, with an estimated 675,000 wintering in the UK[xx], and the presence of semi-domestic or released birds, along with the tendency for the species to be overlooked during mixed-species counts, means that utilisation is likely higher than WeBS data suggest, for instance, the Mersey Estuary SPA peak count for mallard sits at *c.* 1000 birds. Mallard are not considered an important species with regards to the Mersey Estuary (14% of the national threshold;5% of the international threshold.

[xix] *British Trust for Ornithology (BTO). (n.d.). Shoveler. Available at: https://www.bto.org/learn/about-birds/birdfacts/shoveler (Accessed: 16 November 2025).*
[xx] *British Trust for Ornithology (BTO). (n.d.). Mallard. Available at: https://www.bto.org/learn/about-birds/birdfacts/mallard (Accessed: 16 November 2025*

Tufted duck

5.3.56 WeBS 5-year counts for tufted duck at the Mersey Estuary SPA range from 103–741 birds, with 1% thresholds between one to four birds.

5.3.57 When assessing the AEL field data, records of tufted duck were confined to the Canal Pools and were recorded in modest numbers, generally in single figures with the exception of 19 in February and 50 in March in Year 2 and figures in the following year (3) were lower (Table 5-2). These records are sporadic and show no consistent seasonal pattern.

Redshank

Redshank were recorded only in very small numbers across all survey years, with the majority of counts remaining below 1% of the SPA threshold. A single peak of 48 individuals in February (approximately 2% of the threshold) was the only notable increase and is likely to reflect short-term tidal roost overspill or local foraging movements from the Mersey Estuary SPA rather than sustained use of the survey areas (Table 5-2). Within the Mersey Estuary SPA, Redshank is considered nationally (751%) and internationally (294%) important, a pattern strongly associated with the extensive mudflat habitats available throughout the estuary, which provide optimal feeding conditions. Nationally, the species has undergone a 21% population decline but shows a 2.9% expansion in range, with an estimated 100,000 individuals wintering in the UK.[xxi]

Dunlin

Dunlin is a nationally (291%) and internationally (330%) important feature of the Mersey Estuary SPA; however, during surveys the species was recorded only sporadically and always at levels well below the 1% threshold (Table 5-2). As with Redshank, the low occurrence within the Order Limits likely reflects a strong association with the extensive mudflat and coastal habitats elsewhere within the

[xxi] *British Trust for Ornithology (BTO). (n.d.). Redshank. Available at: https://www.bto.org/learn/about-birds/birdfacts/redshank (Accessed: 16 November 2025).*

SPA, which provide optimal feeding conditions and support the majority of the population.

Little Egret

5.3.58 The BTO WeBS 5-year monthly mean counts for Little Egret at the Mersey Estuary SPA are very low (monthly means ranged between 47–141 birds), 1% thresholds around 0.5–1, which is not considered meaningful (Table 5-2).

5.3.59 Only two individuals were recorded in Cell 3 and the Eastern SADA across the AEL surveys (December and March), limited to Cell 3 showing no evidence of regular or significant use (Table 5-2).

Pink-footed Goose

5.3.60 Pink-footed goose are considered an internationally important species of the Mersey Estuary SPA. The BTO monthly peak counts for this species during the non-breeding period range between one to 30,738.

5.3.61 One isolated peak count was recorded throughout the three years of field surveys of 131 birds during March (Table 5-2), Year 3, which is below the 1% threshold for the Mersey Estuary March peak (30738; 1% - 307.4). Based on the lack of observations of this species, or desk study records, it is evident that the species does not regularly forage within the Order Limits.

Whooper Swan

5.3.62 Two records of an individual bird were made during the year 2 surveys (November and December; Table 5-2). The Mersey Estuary SPA 1% threshold for this species ranges between 0-0.29 birds, which is not considered ecologically meaningful.

5.3.63 However, it is important to highlight that the FSL WeBS sector have no records across the 5 years of WeBS counts. Anecdotally, it is understood that small numbers of whooper swan regularly forage on fields to the south of Cell 6, well outside the Order Limits.

Ruff

5.3.64 WeBS 5-year monthly mean counts for Ruff at the Mersey Estuary SPA are very low, ranging from 1–26 birds, with 1% thresholds ranging between 0.1 to 0.26.

5.3.65 During the AEL field surveys, only small single-figure flocks were recorded on a handful of occasions (e.g. 9 in October, 7 in November ,10 in February) over the three years of surveys (Table 5-2). These records show no strong seasonal pattern. Records were confined to Cell 3.

Mute Swan

5.3.66 WeBS 5-year mean counts for Mute Swan at the Mersey Estuary SPA are very low, between 11 and 26 birds per month, with 1% thresholds equating to fewer than one individual.

5.3.67 In the field data collected by AEL (Table 5-2), there were occasional single-figure counts (up to 8 in November- considered an outlier) but no evidence of any consistent seasonal use or concentration within a particular cell. However, all counts were confined to Cell 3.

Greylag Goose

5.3.68 Greylag goose exceeded the 1% monthly threshold of the Mersey Estuary SPA (0.48) on one occasion in the Western SADA (November, Year 3), with two birds. Records largely consisted of single birds, with the occasional peak count of 10 or 11 birds in total (Table 5-2).

5.3.69 The Mersey Estuary SPA monthly threshold for this species is extremely low (0.02-1.46), and many greylag in the region are of feral or semi-domestic origin rather than part of a wild migratory population, which is not possible to distinguish. The record is therefore not considered to be meaningful in the context of the Proposed Development. Further assessment and mitigation is not considered necessary for this species.

Common Snipe

5.3.70 In the Eastern SADA during the field surveys, common snipe exceeded the 1% threshold on several occasions (e.g. 11 in November, 8 in January, 13 in March).

5.3.71 In the Western SADA, the highest isolated count was of 63 bird within Cell 2, with smaller numbers recorded throughout the cells. However, this species was consistently recorded within Cell 3 particularly during Year 3 where between 0-45 birds were recorded across the non-breeding period (Table 5-2).

5.3.72 The Mersey Estuary SPA mean monthly threshold is not considered ecologically meaningful for this species (0.05-1 birds) for such a common and widespread species with the wintering population estimated around one million birds. [xxii]

Great-crested Grebe

5.3.73 WeBS 5-year mean counts for Great Crested Grebe at the SPA are very low, ranging between 29–94 birds, with 1% thresholds below one bird.

5.3.74 The species was only recorded on two occasions, with single figure counts that technically exceeded the 1% threshold due to its very low value, confined to the Canal Pools. These exceedances are not ecologically/ornithologically meaningful given the very small numbers involved.

Water Rail

5.3.75 The species was only recorded on isolated occasions, with single individuals noted in October and December in Cell 3. No pattern of regular use is evident.

5.3.76 WeBS 5-year mean monthly counts for Water Rail at the Mersey Estuary SPA are negligible, with fewer than six birds per month and 1% thresholds falling below 0.05 birds.

[xxii] *British Trust for Ornithology (BTO). (n.d.). Snipe. Available at: https://www.bto.org/learn/about-birds/birdfacts/snipe (Accessed: 15 November 2025)*

5.4 Frodsham Wind Farm Mitigation (Habitat Baseline)

5.4.1 Frodsham Wind Farm (FWF) comprises 19 wind turbines (with a tip height of 125m). The wind farm consent included provision of mitigation habitat for non-breeding bird species associated with the Mersey Estuary SPA in Cells 2, 3 and 5, as required under Condition 33 and 34 of the FWF Section 36 Consent, dated 19th October 2012.

5.4.2 These Cells are managed for Mersey Estuary SPA birds to mitigate impacts predicted to arise from the operation of the wind farm. The prescribed FWF management measures are detailed in the approved 'Outline Habitat Creation Management Plan: Frodsham Marshes Windfarm' (August 2014 report – pursuant to application 14/02525/DIS), hereafter the 'the HCMP'.

5.4.3 Construction of FWF began in March 2015, and it became fully operational in February 2017. The wind farm has a consented lifetime of 25 years. Current mitigation obligations, as detailed in the HCMP, are therefore due to cease in 2042.

5.4.4 Existing wind farm mitigation measures for these Cells are summarised below.

5.4.5 Cell 2 and Cell 5. Both cells comprise grazed pasture with patches of extensive arable weed cover. Managed for Mersey Estuary SPA / Ramsar birds under the HCMP, prescribed as follows:

> *'To maintain the fields, for the duration of the lifetime of the wind farm, in a condition that is favourable for wintering wader species, including golden plover, lapwing and curlew'*.

5.4.6 The entirety of Cell 2 and part of Cell 5 are managed to provide short-sward grassland between October and March (inclusive), as a foraging habitat for the above species.

5.4.7 Cell 3. Provides mitigation for the impacts of displacement on SPA birds as a consequence of the operational wind farm, and is prescribed in the HCMP as follows:

> *'To create and maintain, across the whole area of Cell 3, a low sward grassland with shallow wader scrapes and areas of seasonally open water'.*

5.4.8 It should be noted that the Canal Pools are located outside of Cell 3 and are therefore not included in the FWF mitigation measures in respect of habitat management, aside from the restriction of fishing rights.

5.4.9 In addition, Condition 33 (a) of the FWF Section 36 Consent requires '*the continuing use of Cell 6* [outside the Order Limits] *as a deposit ground for arisings from the Manchester Ship Canal for the duration of the life of the Development, or alternatively other methods for retaining Cell 6 as an attractive habitat for waterfowl'.* As such, Cell 6 will continue to be available for SPA wetland birds throughout the construction of the Proposed Development and for 11-12 years thereafter.

5.4.10 Sections 2.3 and 2.5 of the oNBBMS provide details of current management of Cells 2, 5 and 3 and the efficacy of FWF mitigation. The management and monitoring of FWF mitigation is overseen by a Habitat Creation and Management Group (HCMG), with annual reports produced for Years 1 to 5 of operation. The most recently available report is 'Frodsham Wind Farm Post-Construction Ecological Monitoring Report: Year Five 2021'. According to the most recent HCMG report (Year 5), FWF mitigation is meeting the requirements of planning conditions; however, continued cutting of ruderal vegetation was considered necessary. It is understood that there has been continued liaison between the operator of the wind farm and CWACC, and that ruderal vegetation management is on-going.

5.5 Summary of the Value of the Order Limits to Mersey Estuary SPA Species

5.5.1 Across all survey years, only a limited subset of SPA qualifying and assemblage species regularly used the Order Limits in numbers of potential relevance to the Mersey Estuary SPA/Ramsar site.

5.5.2 Utilisation of the Order Limits was not uniform for each SPA species, and distribution of qualifying species and those part of the waterbird assemblage is overwhelmingly skewed and isolated to particular areas such as Cell 3, the Lum and ditch networks, from within which regular use by significant numbers of SPA birds were recorded.

5.5.3 While Cell 2 did support intermittent use by SPA species, utilisation did not show the same strength or consistency as observed in Cell 3. This may reflect the more transient nature of surface water in Cell 2 during flood events and differences in habitat quality. Use of Cell 1 and Cell 5 was consistently infrequent and by low numbers of SPA species.

5.5.4 The Eastern SADA comprises an area managed by waterfowl and arable land (cereal crops). Arable crop areas were little used by SPA species, possibly due to lower invertebrate availability or higher disturbance, or to the enclosed nature of many fields and the presence of overhead power lines. Except for the Lum area, the Eastern SADA was little used by SPA species, although low numbers were recorded.

5.5.5 These results demonstrate that the overall SADA supports a range of non-breeding waterbirds, with notable seasonal peaks for several SPA species, however this was more pronounced in the Western SADA (Cell 2 and Cell 1) and Cell 3.

5.5.6 Results of the field surveys and desk study together (NECR483, NE FLL plans, BTO WeBS core count sectors) provide a comprehensive data set which enables a clear understanding of bird-use of the Order Limits and how wetland species are spatially distributed throughout. The Weston Marshes BTO count sector data (which fully aligns with the Eastern SADA) were comparable to that collected during field surveys and from the Hynet surveys. Levels of use of the Eastern SADA are consistently low.

5.5.7 By comparison, the Western SADA and Cell 3 (partially covered by the BTO Frodsham Sludge Lagoons count sector) are typified by greater levels and regularity of usage by SPA birds, and are therefore integral to the functionality of the Mersey Estuary SPA.

5.5.8 It is concluded that parts of the Order Limits clearly constitute FLL, particularly Cell 3, Cell 2 and to a lesser extent the other parts of the Western SADA (including Cell 1 and the Canal Pools). Usage of remainder of the Order Limits is evidenced to be limited to lower numbers of SPA species on an infrequent basis. Regardless, the entire Order Limits has potential for use by SPA species and it is therefore necessary to consider the Order Limits as a single coherent habitat area for SPA species. Consequently, HRA assumes that the entire Order Limits is, or has the potential to be, FLL.

5.5.9 It is further concluded that FWF mitigation is operating in accordance with the requirements of the corresponding planning conditions, and therefore levels of bird use recorded during baseline surveys are unlikely to be increased through the continued operation of the FWF consent mitigation scheme.

6.0 HABITATS REGULATIONS ASSESSMENT SCREENING (STAGE 1)

6.1 Introduction

6.1.1 Screening is the process that addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3) of the Habitats Regulations, that is:

i) whether a plan or project is directly connected to or necessary for the management of the European site; and
ii) if not directly connected to or necessary for European site management, whether a plan or project, alone or in-combination with other plans and projects, is likely to have significant effects on a European site in view of its conservation objectives.

6.1.2 Under the first test, the purpose of the Proposed Development is not directly connected with or necessary to the management of a European site. Therefore, the second test needs to be undertaken to determine whether the Proposed Development has the potential to have LSEs on a European site.

6.2 Consultation

6.2.1 The Applicant has engaged with Natural England through their Discretionary Advice Service (DAS) on the scope and method of surveys to inform the Environmental Impact Assessment (EIA) and this report over the course of the pre-application period.

6.2.2 Pre-application consultations are described in the **ES Vol 1 Chapter 8: Ornithology [EN010153/DR/6.1]** and presented in **Consultation Report [EN010153/DR/5.1].** See **Table 5-1** below for all pre-submission relevant consultee responses in relation to the Habitats Regulations Assessment and European sites.

6.2.3 The Applicant continued to consult with Natural England during the Examination period in relation to this document, the ONBBMS document and its mitigation proposals . This consultation is recorded within the Statement of Common Ground with Natural England [EN010153/DR/8.4] submitted into the Examination. Natural England requested additional analysis to be undertaken to provide an improved understanding of the impact of the Proposed Development and also modifications to the proposed mitigation, which included the integration of Cell 2 into the NBBMA.

The Applicant provided the information requested and has included Cell 2 into the NBBMA. On this basis Natural England are in agreement with the conclusions of this report.

Table 6-1. Statutory Consultee Responses; Habitats Regulations Assessment (HRA)

Consultee	Comment	Response
Natural England Scoping Opinion 28th June 2023	The development site may impact on the following European/internationally designated nature conservation site(s): Mersey Estuary SPA; and Mersey Estuary Ramsar	Impacts on the ornithological features of these sites are addressed in Section 8.8 (ES Vol 1 Chapter 8: Ornithology [EN010153/DR/6.1]) and are considered in the HRA (see ES Volume 2 Appendix 8-3).
Natural England Scoping Opinion 28th June 2023	Due to the proximity of the site to the Mersey Estuary SPA/Ramsar we advise that potential water quality impacts need to be assessed, including potential for increased nutrient and other pollutant inputs.	Impacts (including potential for runoff and pollution) on the Mersey Estuary SPA/Ramsar are considered in Section 8.7 (ES Vol 1 Chapter 8: Ornithology [EN010153/DR/6.1]) and Section 8.8 (ES Vol 1 Chapter 8: Ornithology [EN010153/DR/6.1]). These impacts are considered in the HRA (see Information to Inform Habitats Regulations [EN010153/DR/5.3]).
Natural England Scoping Opinion 28th June 2023	Due to the proximity of the site to the Mersey Estuary SPA/Ramsar we advise further consideration of the potential for any dust during construction and any appropriate measures to limit dust from the development.	Impacts (including potential for dust pollution) on the Mersey Estuary SPA/Ramsar are considered in Section 8.7 (ES Vol 1 Chapter 8: Ornithology [EN010153/DR/6.1]) and Section 8.8 (ES Vol 1 Chapter 8: Ornithology [EN010153/DR/6.1]). These impacts are also considered in the HRA (see Information to Inform Habitats Regulations [EN010153/DR/5.3]).
Natural England Scoping Opinion 28th June 2023	Due to the proximity of the site to the Mersey Estuary SPA/Ramsar, and surrounding functionally linked land, we advise that further consideration of the potential for noise and vibration impacts during all phases of the development is required, together with any appropriate mitigation. We note that a Noise Impact Assessment accompanies the scoping report but that it assesses construction noise impacts to residential receptors and the River Weaver only. All ecological receptors should be assessed, including the Mersey Estuary SPA/Ramsar	Impacts (including potential for noise and vibration) on the Mersey Estuary SPA/Ramsar are considered in Section 8.7 (ES Vol 1 Chapter 8: Ornithology [EN010153/DR/6.1]) and Section 8.8 (ES Vol 1 Chapter 8: Ornithology [EN010153/DR/6.1]). These impacts are also considered in the HRA (see Information to Inform Habitats Regulations [EN010153/DR/5.3]).
Natural England PEIR response	Impacts to SPA/Ramsar features Natural England does not agree with the statement made in paragraph 8.8 (ES Vol 1 Chapter 8: Ornithology [EN010153/DR/6.1]).6 that 'the numbers and regularity that SPA qualifying species used the Main Development Area as determined during field surveys is not representative of the habitat being	Using the 1 % threshold of the Mersey Estuary population (and consideration of the frequency of use in numbers that surpass the 1 % threshold), FLL based on the survey results is not determined. However, as noted in Section 8.6 (ES Vol 1 Chapter 8: Ornithology [EN010153/DR/6.1]) based on discussions with Natural England and with reference to the Natural England NECR483 Edition 1 report (2023), the

Consultee	Comment	Response
	Functionally Linked Land ('FLL') to the Mersey Estuary SPA, with the counts of recorded species substantially below the 1 % threshold of the Mersey Estuary population'. We note that although survey results are summarised within Tables 8-12 and 8-13 that the percentage figures for the SPA population have not been displayed, we advise these figures form an important part of the assessment as they will indicate which SPA species are present in significant numbers and so which birds need to be mitigated for. The HRA should consider any significant numbers of qualifying SPA/Ramsar bird species and the waterbird assemblage, based on the peak counts recorded across the entire site. We highlight that all 'waterbirds' form part of the waterbird assemblage and it is the assemblage as a whole that is the feature to be assessed within a HRA, with reference to the Conservation Objectives. The integrity of the assemblage (non-breeding) is generally recognised as a product of both abundance and diversity as set out within our Supplementary Advice on Conservation Objectives	SADA and the NBBMA is considered as FLL, and therefore appropriate mitigation measures would be adopted to ensure the Site integrity of the Mersey Estuary SPA and Ramsar site are not negatively impacted. Tables 8-14 to 8-18 provide counts of target species using the SADA, the NBBMA and offsite locations. Table 8-19 has been added and provides the monthly peak number of target species over the three survey years for the SADA, with the % of the Mersey Estuary SPA that the peak count represents to provide an indication of those target SPA/Ramar species which were reported in the most significant numbers (and to aid mitigation requirements). Section 8.8 (ES Vol 1 Chapter 8: Ornithology [EN010153/DR/6.1]) considers the usage of the SADA and the NBBMA by target species and discusses whether these are considered significant numbers or not. The HRA (see Information to Inform Habitats Regulations [EN010153/DR/5.3]) assesses whether there are likely significant effects (LSEs) on the SPA and Ramsar site. The HRA has used peak counts across the entire Site in order to assess LSEs on a worst-case scenario basis. The HRA considers LSEs on all recorded SPA/Ramsar species, and with reference to the Conservation Objectives. Bird number (abundance) is the measure that is mainly used in the assessment, but consideration is also given to effects on particular target species and mitigation that is required (Section 8.8 (ES Vol 1 Chapter 8: Ornithology [EN010153/DR/6.1]) discusses effects on target species, with the HRA addressing specifically LSEs on the integrity of the Mersey Estuary SPA and Ramsar, and its qualifying species.
Natural England PEIR response	Natural England disagrees with the conclusions regarding noise disturbance and the statement made in paragraph 8.8.7 'Noise Impact Assessment (PEIR Volume 2 Appendix 4- 1) reveals that all anticipated activities that have potential to cause higher levels of noise associated with the Proposed Development (including CFA piling and movement and activity of HGVs associated with the BESS, works within the NBBMA such as activity of dump trucks, excavators and dozer, and plant installing the solar arrays)	Background noise monitoring (see ES Volume 2 Appendix 4-1 for full details) and a noise assessment has been undertaken which predicts that construction and operational noise levels are consistently within the acceptable range in relation to potential disturbance, including that specified in the Natural England guidance. The noise assessment has considered different works and activities (including piling and movement of plant and the installation of solar arrays) within the Site, so it is considered that this is captured the Site-specific activity and disturbance that is predicted.

Consultee	Comment	Response
	would result in predicted noise levels which are consistently within the acceptable range in relation to potential disturbance to waterbirds according to the (TIDE) assessment criteria'. The Noise Impact Assessment relies upon the thresholds taken from the Waterbird Disturbance Mitigation/ TIDE Toolkit to rule out significant noise impacts on SPA birds. However Natural England advise that the thresholds set out within the Toolkit are not applicable in individual developments as each development site is different with different background levels and existing patterns of disturbance. As any disturbance is likely to be site and species specific the use of thresholds is not appropriate. We advise the ES and HRA considers the baseline noise levels at bird and a comparison is made with the expected peak noise levels (LAmax) during each stage of the construction works (including the use of multiple types of machinery at the same time). Where there is an increase of 3dB or above then further assessment is required and appropriate mitigation provided. Consideration of the effects of noise and the increased use of the access routes to the development site should also be included in any assessment. We note that construction noise maps for the expected LAeq levels have been included within the Noise Impact Assessment (Appendix 3) which is welcomed however we advise maps are also produced for the LAmax levels, and that further detail on the works being assessed for each map would also be useful. We similarly advise caution when considering distance thresholds (paragraph 8.8.5), and the application of the buffer distances set out within the Goodship and Furness (2022) Disturbance Distances Review report. Although these distances can be used as guidelines when considering disturbance from human activity, they may not be appropriate for	Section 8.8 (ES Vol 1 Chapter 8: Ornithology [EN010153/DR/6.1]) and the HRA (Information to Inform Habitats Regulations [EN010153/DR/5.3]) considers the baseline noise levels and the fact that target species will already be habituated to a level of disturbance (noise and visual) due to the industrialised nature of the locality and considers this in relation to potential effects on birds of increased noise levels during the construction works. Noise management measures would be secured via the oCEMP [EN010153/DR/7.5], and no further mitigation is deemed necessary. Effects of noise and increase use of the access routes are considered in Section 8.8 (ES Vol 1 Chapter 8: Ornithology [EN010153/DR/6.1]). The noise monitoring also discusses LAmax levels with no predicted significant effects on birds on those areas considered potentially most sensitive (see ES Volume 2 Appendix 4-1 for full details). Goodship and Furness (2022) is considered as the standard guidance for disturbance limits for target species. However, within the assessment (see Section 8.8 (ES Vol 1 Chapter 8: Ornithology [EN010153/DR/6.1])) the reported disturbance distances are not only considered in terms of determining effects, but other factors are also regarded, such as topography/ presence of bunds buffering noise/visual intrusion and current activity at the locality. Section 8.8 of ES Vol 1 Chapter 8: Ornithology [EN010153/DR/6.1])) and the HRA (in Information to Inform Habitats Regulations [EN010153/DR/5.3]) considers effects of plant and machinery during the construction phase, and it is acknowledged that some of the machinery that would be used is novel to the locality. Accordingly, effects of all possible activities and machinery/plant expected within the Site is considered on SPA/Ramsar birds is considered.

Consultee	Comment	Response
	construction activities. We acknowledge that whilst there may be habituation to existing levels and types of disturbance by birds using both the designated site the construction period however will involve the use of machinery that is not typically in use within the development area and so further consideration will be needed within the ES and HRA regarding disturbance levels and impacts for SPA/Ramsar birds	
Natural England Discretionary Advice Service (DAS) 24554/412803 24th March 2023	DAS consultation was sent on 16th November 2022 from Avian Ecology (on behalf of the Applicant) regarding non-breeding ornithology. Advice provided by Natural England is based on a review of the request for Discretionary Advice from November 2022, Frodsham Solar Wintering Bird Report by RSK Biocensus dated March 2022 and the Frodsham Wind Farm Post Construction Ecological Monitoring Report for Year three 2019, dated June 2020. The Proposed Development has potential to impact the Mersey Estuary SPA, Mersey Estuary Ramsar and the Mersey Estuary SSSI. On the basis of the proximity of internationally designated sites to the Proposed Development a HRA will be required. In considering the European site interest, Natural England advises that regard should be given to any potential impacts that a plan/project may have. The Conservation Objectives for each European site explain how the site should be restored and/or maintained and may be helpful in assessing what, if any, potential impacts a plan/project may have. Natural England's main concern is potential impacts on SPA birds, particularly possible displacement of species using the Site for overwintering and passage periods. The HRA will need to address these impacts, and Natural England can provide further advice on a draft HRA in due course. An in-combination assessment needs to assess	Potential impacts on the Mersey Estuary SPA and Ramsar site are considered in Section 8.8 (ES Vol 1 Chapter 8: Ornithology [EN010153/DR/6.1]), and are also considered in the HRA (see Information to Inform Habitats Regulations [EN010153/DR/5.3]). The cumulative assessment considers other relevant schemes, see Section 8.11, and are considered in the HRA as in-combination effects (see Information to Inform Habitats Regulations [EN010153/DR/5.3]). Effects on ornithological features of the Mersey SPA, Ramsar site and SSSI are accordingly considered together in Section 8.8 (ES Vol 1 Chapter 8: Ornithology [EN010153/DR/6.1]), given the SPA qualifying species covers those species listed in the SSSI citation. Other data sources including survey results from the operational Frodsham Wind Farm monitoring, for the HyNet North West hydrogen pipeline route are considered in this chapter, in Section 8:6. Information from the VP flight activity surveys is considered supplementary to the data gathered from the two years of non-breeding bird walk-over surveys, and data collected from other sources (as detailed in Section 8:6). The potential for displacement effects of Mersey Estuary SPA qualifying species as a result of the Proposed Development are considered in Section 8.8 (ES Vol 1 Chapter 8: Ornithology [EN010153/DR/6.1]), which provides information on the mitigation proposed to provide alternative better-quality habitat for SPA qualifying species. Impacts on the Mersey Estuary SPA and Ramsar site are considered in the HRA (see Information to Inform Habitats Regulations [EN010153/DR/5.3]).

Consultee	Comment	Response
	whether there are any other plans/projects in the vicinity which have the same effect at this Proposed Development. This could include plans from neighbouring Local Planning Authorities. Plans to consider are those incomplete parts projects or those projects already commenced, consented projects not yet started, projects currently subject to an application for consent, projects are being appealed, ongoing projects that are the subject of a regular review, any draft plans being prepared by any public body and any proposed projects published for consultation prior to the application. Natural England confirmed satisfaction with the ornithology non-breeding survey effort and methodology followed, as well as the scope of baseline data to be considered (noting to ensure up to date baseline data is considered for the EIA and HRA). Natural England agreed that given the protected bird features of the Mersey Estuary SSSI are all covered by the SPA/Ramsar designations it is reasonable to conclude that there is no requirement for additional survey data or further assessments to determine any impacts to the Mersey Estuary SSSI with regards to non-breeding birds. Consideration should be made of the results detailed in the most recent Post-Construction Ecological Monitoring Report (Atmos Consulting Ltd., 2021). Consideration should also be made to supporting data which was included for the nearby HyNet North West hydrogen pipeline route. Natural England agree that bird usage of the Site is the primary consideration for the assessment and detailed information should be provided within a HRA to ensure a robust assessment of potential impacts to protected birds to be undertaken. Information from VP surveys are useful indicators of which bird species are present, their numbers and use of the Site,	

Consultee	Comment	Response
	but advised that VP surveys are only used to supplement further bird survey evidence and WeBS data. Natural England advised that it would need to be clear in the assessment that the Proposed Development does not add to any displacement effects and the alternative habitat provided under the wind farm commitments is adequate for all the displaced birds, thereby maintaining nearby SPA population.	
Natural England Discretionary Advice Service DAS/412803 7th September 2023	Site visit with representatives from Natural England and the Applicant team (Axis Cubico and Avian Ecology) in attendance. Discussion was focussed on wetland birds and the Mersey Estuary SPA. Natural England stated that, based on the information they have, parts of the Site should be considered as functionally linked to the Mersey Estuary SPA as this has been established in the previous wind farm application. Natural England accepted that mitigation using Cell 3 might be possible but would depend on clarification of current Cell 3 requirements and levels of SPA bird use across the Site. Natural England agreed to continue to liaise with the Applicant on the oNBBMS.	The assessment of the Proposed Development has assumed that parts of the Site (the Cells at least) constitute functionally linked land and is therefore precautionary. The proposed NBBMS [EN010153/DR/8.32]is design to provide additive mitigation, i.e. in addition to that already in place. Post this correspondence, the Applicant has continued to develop the oNBBMS and consulted with Natural England on the matter using the DAS in preparation for the submission of the Application.
Natural England Discretionary Advice Service DAS/412803 7th August 2024	A DAS consultation was sent on 23rd May 2024 from Avian Ecology (on behalf of the applicant) regarding the Applicant's Outline Non-Breeding Bird Mitigation Strategy (oNBBMS).Natural England welcomed the overall approach to the use of Cell 3 for mitigation but remain concerned over the methods used to determine if the proposed mitigation in Cell 3 is sufficient to support all the displaced birds from the Proposed Development. Natural England advised that consideration should be given to the potential for Cell 3 to support SPA qualifying species (i.e. what was the intention of the wind farm habitat	A response from Avian Ecology (on behalf of the Applicant) was issued to Natural England dated 26th September 2024. This provided specific responses to questions posed by Natural England's letter, and also re-calculated bird-day calculations to help determine the extent of mitigation area needed, including peak counts from other data sources (e.g., CAWOS), as requested by Natural England. The response letter also included discussion into the likely betterment achieved from enhancement measures through quality habitat provision, and the commitment for ongoing management and monitoring. Discussions with Natural England into the requirement for mitigation area (and suitability of Cell 3 to provide appropriate alternative better-quality habitat for SPA qualifying species that may be displaced by the Proposed

Consultee	Comment	Response
	management in terms of numbers of SPA qualifying species) Cell 3 could support. Advised that peaks from CAWOS data should be considered in bird-day calculations to work out the required amount of mitigation area needed. Natural England stated that it is not possible to quantify any increase in carrying capacity by habitat betterment of Cell 3. Advised that ongoing management (and monitoring) will be crucial for the success of the NBBMS.	Development) are ongoing, and advice from Natural England has been considered in the NBBMS, which supports this ES. The NBBMS is provided as Appendix B - Outline Non Breeding Bird Mitigation Strategy (oNBBMS) [EN010153/DR/7.13] within Outline Landscape and Ecological Management Plan [EN010153/DR/7.13].
Meeting at Avian Ecology's Head Office on 3rd October 2024.	Attended by representatives of Natural England, CWaCC, RSPB, Avian Ecology, Axis, and the Applicant. The meeting was arranged specifically to discuss key points regarding the oNBBMS. These mainly concerned the required area required for enhancement to provide alternative habitat for displaced SPA-qualifying species as a result of the Proposed Development.	All parties were agreed that, in principle, the oNBBMS [EN010153/DR/8.32]would provide acceptable mitigation and also provide enhancement. It was agreed that additive mitigation was possible but identified a clear requirement to establish and agree baseline conditions in Cell 3. All parties accepted there are limitations to what can be achieved in Cell 3 under the current (wind farm) mitigation. The meeting included lengthy discussion of the use of bird-day calculations to establish mitigation requirements, and it was generally accepted that these calculations make no consideration of habitat quality. The Applicant also provided additional clarifications regarding bird record locations ('heat maps') within the Order Limits, along with tabulated data showing peak counts and a narrative on the habitat use by SPA qualifying species, all as requested by NE. As such the baseline is comprehensively established against which assessment can be made and a differentiation of the proposed management measures between FWF and the Proposed Development can be demonstrated and therefore the specific objectives of the oNBBMS [EN010153/DR/8.32] met. RSPB were explicit in that the oNBBMS [EN010153/DR/8.32], if delivered and managed fully, would provide improvement over current conditions or any which could be achieved under the wind farm HMMP. Natural England wished to see detailed bird-day calculations and baseline information before commenting further. CWaCC suggested that the parties should agree which measures can and should be delivered under the wind farm HMMP, so as to enable these to be distinguished

Consultee	Comment	Response
		from those provided under the oNBBMS [EN010153/DR/8.32]. Some levels of uncertainty over the opportunities to improve existing. Discussions between the parties in attendance are ongoing on this matter, and the Applicant is committed to providing the information requested as outlined and continued engagement so a clear and deliverable mitigation strategy can be delivered.

6.3 Identification of European Sites

6.3.1 The Proposed Development is not located within any European-designated site. However, four statutory Sites of European importance are situated within 10km of the Order Limits.

6.3.2 These sites are summarised in Table 6-2 and are shown in **Figure 1, Figure 2, Figure 2a, Figure 2b, Figure 2c and Figure 2d.**

Table 6-2: European sites qualifying features.

Site Name (and designation)	Distance and Direction	**Qualifying Features**
Mersey Estuary SSSI[xxiii] Although not a European Site, this SSSI is included in the designation table as it underpins the interest features of the corresponding SPA/Ramsar site and is therefore relevant to the assessment of impacts on European site integrity (**Figure. 2b**).	Small part of the SSSI (Unit ID 1011753: Mersey Estuary SSSI – Frodsham Lagoons) lies within the Order Limits	This SSSI is an important roosting site for wildfowl and waders at high tide. Throughout the winter the Site supports large numbers of wildfowl and waders. The birds feed on the rich invertebrate fauna of the intertidal sediments as well as plants and seeds from the saltmarsh and nearby agricultural fields. The site is a valuable staging post for migrating birds in spring and autumn. The site supports (internationally) important numbers of: pintail, teal, shelduck, wigeon and dunlin, with nationally important numbers of curlew, redshank and golden plover.
Mersey Estuary Special Protected Area (SPA)[xxiv] (**Figure 2a**).	72m northwest	This SPA is designated for the following ornithological qualifying features: • Shelduck (non-breeding);

[xxiii] *Natural England. (n.d). Citation for Site of Special Scientific Interest (SSSI): Mersey Estuary. Available at: https://designatedsites.naturalengland.org.uk/PDFsForWeb/Citation/1001398.pdf (Accessed: 3 March 2025).*
[xxiv] *Natural England. (n.d). European Site Conservation Objectives for Mersey Estuary SPA. Available at: https://publications.naturalengland.org.uk/publication/5790848037945344 (Accessed: 3 March 2025).*

Site Name (and designation)	Distance and Direction	**Qualifying Features**
		• Teal (non-breeding); • Pintail (non-breeding); • Golden plover (non-breeding); • Dunlin (non-breeding); • Black-tailed godwit (non-breeding); and, • Redshank (non-breeding). Waterbird assemblage- non-breeding
Mersey Estuary Ramsar Site[xxv] (**Figure 2a**).	72m northwest	Qualifying species: • Dunlin- Wintering • Pintail- Wintering • Black-tailed godwit- passage • Redshank – Wintering and passage • Shelduck – Wintering and passage • Teal – Wintering Waterbird assemblage – Wintering
Midland Meres & Mosses - Phase 1 Ramsar[xxvi] (**Figure 2c)**.	6.7km	Designated features: • Open water transition fen ('mere'), lowland raised bog ('moss') and associated habitats • Wetland invertebrate assemblage

[xxv] *Joint Nature Conservation Committee. (n.d). Information Sheet on Ramsar Wetlands (RIS): Mersey Estuary. Available at: https://jncc.gov.uk/jncc-assets/RIS/UK11041.pdf (Accessed: 3 March 2025).*

[xxvi] *Natural England (n.d.) Midland Meres & Mosses Phase 1. Available at: https://designatedsites.naturalengland.org.uk/SiteGeneralDetail.aspx?SiteCode=UK11043&SiteName=Midland%20Meres&countyCode=&responsiblePerson=&SeaArea=&IFCAArea= (Accessed: 4 March 2025).*

Site Name (and designation)	Distance and Direction	**Qualifying Features**
		• Wetland plant assemblage
Midland Meres and Mosses- Phase 2 Ramsar Site[xxvii] (**Figure 2c)**.	7.0km	Nationally important species occurring on the Site, include the following: Higher Plants: • *Calamagrostis stricta,* • *Carex elongata,* • *Cicuta virosa,* • *Thelypteris palustris* Lower Plants: • *Sphagnum pulchrum,* • *Dicranum* undulatum Species currently occurring at levels of national importance: Species with peak counts in spring/autumn and winter: • Shoveler - Passage • Cormorant - Winter • Bittern - Winter • Water rail -Winter Nationally important invertebrate species occurring on the Site. • *Limnophila heterogyna,*

[xxvii] *Natural England (n.d.) Midland Meres & Mosses Phase 2. Available at: https://designatedsites.naturalengland.org.uk/SiteGeneralDetail.aspx?SiteCode=UK11080&SiteName=Midland%20Meres&countyCode=&responsiblePerson=&SeaArea=&IFCAArea= (Accessed: 4 March 2025).*

Site Name (and designation)	Distance and Direction	**Qualifying Features**
		• *Atylotus plebeius,* • *Hagenella clathrata,* • *Limnophila fasciata,* • *Carorita limnaea,* • *Glyphipteryx lathamella,* • *Trichiosoma vitellinae,* • *Eilema serica,* • *Brachythops wusteneii,* • *Pachinematus xanthocarpos,* • *Sittcus floricola,* • *Lampronia fuscatella,* • *Hybomitra*

6.4 European Site Conservation Objectives

6.4.1 Natural England has established generic Conservation Objectives that apply to each European site's designated interest features. These objectives are further supported by Supplementary Advice on Conservation Objectives (SACOs[xxviii]), which provide site-specific guidance to clarify what may constitute an adverse effect on a European site's features. SACOs are periodically updated and may not yet be available for all European sites.

6.4.2 In cases where supplementary advice is not available, Natural England recommends that HRAs rely on the generic objectives, adapting them to the specific conditions of the European site.

6.4.3 For SPAs, the primary objective is to prevent habitat deterioration and significant disturbance to qualifying bird species, ensuring the site's integrity is maintained. This enables the site to contribute fully to the aims of the Habitats Regulations, which is achieved by maintaining and restoring bird populations, subject to natural change.

6.4.4 The Conservation Objectives of the European sites identified in Table 5-2 are presented as follows.

Mersey Estuary SPA and Ramsar [xxix]

6.4.5 Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:

iii) The extent and distribution of the habitats of the qualifying features;
iv) The structure and function of the habitats of the qualifying features;
v) The supporting processes on which the habitats of the qualifying features rely;
vi) The population of each of the qualifying features; and
vii) The distribution of the qualifying features within the site.

[xxviii] *Natural England (2025) 'Supplementary Advice for Mersey Estuary SPA'. Available at: https://designatedsites.naturalengland.org.uk/ConservationAdvice/SupplementaryAdvice.aspx?SiteCode=UK9005131&SiteName=mersey%20estuary&SiteNameDisplay=Mersey+Estuary+SPA&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=7 (Accessed: May 2025).*
[xxix] *Natural England (2014) European Site Conservation Objectives for Mersey Estuary SPA (UK9005131). Natural England. Available at: https://publications.naturalengland.org.uk/publication/5790848037945344 (Accessed: 27 May 2025).*

6.4.6 The SACOs relevant to this HRA Report, as published by Natural England and the Joint Nature Conservation Committee (JNCC), are referenced where relevant in Section 5 (Appropriate Assessment) of this HRA.[xxx]

6.4.7 Most of the units of the Mersey Estuary SSSI (12 live units) are in unfavourable- no change (46%) and unfavourable- recovering (24.71%)[xxxi], which is largely due to inappropriate management (over/under grazing, erosion) and Invasive Non-native species (INNS).

6.4.8 The pressures and threats attributed to the Mersey Estuary[xxxii] include:

viii) Changes in species distributions (pressure);
ix) INNS (pressure and threat); and
x) Public access and disturbance (pressure)

Midland Meres and Mosses Phase 1 & 2 Ramsar [xxxiii] [xxxiv]

6.4.9 Conservation Objectives for European sites such as the Midland Meres and Mosses Phases 1 and 2 Ramsar sites are typically documented by Natural England and may be linked to associated Special Areas of Conservation (SACs) or Sites of Special Scientific Interest (SSSIs) within the Ramsar designation. Site specific Conservation Objectives were not available at the time of assessment.

6.4.10 In their absence, the following threats and pressures have been identified as relevant to both sites.

i) Pollution;

[xxx] *Natural England & Joint Nature Conservation Committee (JNCC), Supplementary Advice on Conservation Objectives (SACOs), [online] Available at: <https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK9005131&SiteName=mersey&SiteNameDisplay=Mersey+Estuary+SPA&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=7> [10th March 2025].*

[xxxi] *Natural England (n.d.) Mersey Estuary SSSI: Unit condition summary. Available at: https://designatedsites.naturalengland.org.uk/ReportUnitConditionSummary.aspx?SiteCode=S1001398 (Accessed: 21 January 2026).*

[xxxii] *Natural England (2014) Site Improvement Plan: Mersey Estuary (SIP138). Improvement Programme for England's Natura 2000 Sites (IPENS). Available at: https://publications.naturalengland.org.uk/publication/6273450410770432 (Accessed: 22 January 2026).*

[xxxiii] *Joint Nature Conservation Committee (JNCC). (1994). Information Sheet on Ramsar Wetlands (RIS): Midland Meres and Mosses Phase 1. Available at: https://jncc.gov.uk/jncc-assets/RIS/UK11043.pdf (Accessed: 12 March 2025).*

[xxxiv] *Joint Nature Conservation Committee (JNCC). (1997). Information Sheet on Ramsar Wetlands (RIS): Midland Meres and Mosses Phase 2. Available at: https://jncc.gov.uk/jncc-assets/RIS/UK11080.pdf (Accessed: 12 March 2025).*

ii) Invasive species; and
iii) Eutrophication.

6.4.11 Note that the Meres and Mosses Phases 1 and 2, do not contain any live units, however there are three monitored features not allocated to units which include open water transition fen ('mere'), lowland raised bog ('moss') and associated habitats, Wetland invertebrate assemblage and Wetland plant assemblage which are associated with Phase 1. There is no favourability status attached to these.[xxxv]

6.4.12 As the provisions on the Habitats Regulations relating to HRAs extend to Ramsar sites, Natural England generally considers the conservation advice packages for the overlapping SPA designations to be, in most cases, sufficient to support the management of the Ramsar interests.[xxxvi]

6.5 Natural England Guidance on the Mersey Estuary SPA

6.5.1 Natural England has published two reports specific to the Mersey Estuary area, and therefore of potential relevance to the HRA. Both have been reviewed. These are:

iv) Review and Analysis of Changes in Waterbird Use of the Mersey Estuary SPA, Mersey Narrows & North Wirral Foreshore pSPA and Ribble & Alt Estuaries SPA[xxxvii]; and
v) Identification of Functionally Linked Land (FLL) supporting SPA waterbirds in the Northwest of England.[xxxviii]

6.5.2 The first of the above two reports provide data on waterbird population trends and habitat use in several SPAs, informing assessments of potential impacts on these areas. The Identification of FLL document maps critical habitats outside SPAs that

[xxxv] *Natural England (n.d.) Midland Meres SPA: Features matrix. Available at: https://designatedsites.naturalengland.org.uk/SiteSPAFeaturesMatrix.aspx?SiteCode=UK11043 (Accessed: 21 January 2026).*
[xxxvi] *Natural England (n.d.) Mersey Estuary Ramsar. Available at: https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK11041&SiteName=mersey&SiteNameDisplay=Mersey%20Estuary%20Ramsar&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=&HasCA=0 (Accessed: 4 March 2025).*
[xxxvii] *Ross-Smith, V.H., Calbrade, N.A., Wright, L.J. & Austin, G.E. (2015) Waterbird population trend analysis of the Mersey Estuary SPA, Mersey Narrows & North Wirral Foreshore pSPA and Ribble & Alt Estuaries SPA. Natural England Commissioned Report NECR172. British Trust for Ornithology.*
[xxxviii] *BOWLAND ECOLOGY. 2022. Identification of Functionally Link Land in the North West of England – Phase 2. NECR483. Natural England.*

support waterbirds, ensuring these areas are considered in HRAs to protect the integrity of the SPAs.

6.6 Identification of Potential Impacts

6.6.1 This section sets out the identified potential impacts on the qualifying features associated with the European sites from the Proposed Development. These include consideration of the construction, operational and decommissioning phases. Decommissioning impacts are considered likely to be similar to, or less than, those identified for the construction phase.

6.6.2 It is acknowledged that environmental conditions and technological approaches may evolve over the operational life of both the SADA and NBBMA, introducing some uncertainty around future decommissioning impacts.

6.6.3 During the operational phase, routine maintenance activities would be limited primarily to vegetation and landscape management; maintenance of footpaths, recreational facilities and fencing; equipment maintenance; and servicing, cleaning of solar PV modules, and onsite agricultural management e.g. associated with grazing. There would also be a requirement for replacement of components. It can be expected that there would be one or more replacements of the solar array equipment, including Power Conversion Units, as well as the BESS equipment, required over the 40-year lifetime of the project (currently anticipated to be 2030. to 2070). The replacement of components would be periodic throughout the lifetime of the scheme and would not involve the intensity of construction required at the outset of the project. As such, whilst the types of impacts could be similar, the magnitude of effect experienced during the replacement and maintenance works would be less than that assessed for the construction phase. This report has therefore considered the potential for impacts to occur during the operational phase at periodic intervals. More detail on the approach to, and requirement for, replacement activities is provided in **Environmental Statement: Volume 1 Chapter 2: The Proposed Development [EN010153/DR/6.1].**

6.6.4 Decommissioning activities would commence 40 years after final commissioning (currently anticipated to be 2070). All solar PV modules, mounting poles, cabling, inverters, transformers, BESS equipment, the Frodsham Solar Substation, and fencing would be removed from the Site and recycled or disposed of in accordance

with good practice and market conditions at that time. As committed to in the **Outline Decommissioning Environmental Management Plan [EN010153/DR/7.7 and as updated during Examination]** the Site would be returned to a condition suitable in accordance with its original use after decommissioning.

6.6.5 On decommissioning, the landscaping works undertaken across the Site would remain in place, and the land would be handed back to the landowner, with the only exception being the potential requirement by the landowner to revert the grassland created on the eastern half of the Site (to the east of Brook Furlong) and the Skylark Mitigation Area to land suitable for arable farming. Given that the western half of the Site is currently used for grazing, the grassland created and managed in this area would be retained.

6.6.6 It is likely that tree and scrub planting, together with created pond and wetland habitats, would be retained, including the habitats created within the NBBMA. However, as the land would be handed back to the landowners on completion of decommissioning the long-term retention of the landscaping improvement works cannot be guaranteed. Similarly, following decommissioning the landowner may or may not retain the permissive footpaths created across the Site.

6.6.7 Decommissioning would be phased and is expected to take 12 to 24 months.

6.6.8 The following potential impact pathways have been identified:

i) Habitat degradation due to changes in air quality;
ii) Habitat degradation due to changes in water quality;
iii) Loss of FLL used by qualifying bird species and waterbird assemblage;
iv) Disturbance or displacement of qualifying bird species from FLL; and
v) Disruption to bird flight paths due to glint and glare effects.

6.6.9 The potential impacts from each are discussed in turn. Note that the potential pathways are considered for all phases, construction, operational and decommissioning phases. The pathways per phase are confirmed in the screening assessment table (Table 8-1).

Degradation of habitats due to changes in air quality

6.6.10 A reduction in air quality because of potential dust pollution and increased traffic in the construction, operation and decommissioning phases for both the NBBMA and the SADA of the Proposed Development has the potential to lead to degradation of habitats within the European sites.

Degradation of habitats due to changes in water quality

6.6.11 Hydrological linkage exists between the Proposed Development Order Limits, FLL within the Order Limits, the River Weaver, the Manchester Ship Canal, and the River Mersey, which could provide pathways for waterborne pollutants to reach the Mersey Estuary SPA and Ramsar.

6.6.12 Potential effects include during the construction, operation and decommissioning phases include:

i) Surface water runoff carrying fine sediments and pollutants;
ii) Increased turbidity and sedimentation;
iii) Chemical contamination from construction-related pollutants; and
iv) Water quality impacts as a result of Invasive non-native species, notably New Zealand pigmyweed *Crassula helmsii* (NZPW).

Loss of functionally linked land for qualifying bird species and waterbird assemblage species

6.6.13 Construction will not result in direct loss of habitats within the European sites identified in Table 6-2. However, land within and adjacent to the Order Limits to the Mersey Estuary SPA and Ramsar do constitute 'FLL' for qualifying bird species and the waterbird assemblage for which the European sites are designated (discussed further in Section 9.2).

6.6.14 As such, there will be a potential temporary loss and fragmentation of FLL (Mersey Estuary SPA) during the construction period, and potential for long-term loss of FLL for usage by birds under the footprint of the solar PV modules and associated infrastructure where this is above ground level for the period of the Proposed Development, i.e. 40 years.

6.6.15 Loss of FLL is anticipated within Cell 3 during the construction phase of the NMBBA component of the Proposed Development only, and is therefore temporary.

Disturbance/ displacement of qualifying bird species from FLL

6.6.16 There is potential for disturbance/displacement of SPA/Ramsar site qualifying bird species and the waterbird assemblages utilising FLL within and (or) adjacent to the Order Limits during the construction and operational and decommissioning phases. This could reduce feeding efficiency and/or lead to changes in species distribution and therefore contradict the conservation objectives of the SPA/Ramsar sites. Potential disturbance could arise from:

i) Vehicle movements;
ii) Increased human presence;
iii) Construction noise and vibratory works;
iv) Temporary construction works associated with Unexploded Ordnance (UXO) (ES: Volume 2 Appendix 10-1: Stage 1 Geo-Environmental Assessment [**EN010153/DR/6.2**];
v) Light spill; and
vi) Operational maintenance of the Proposed Development, including conservation management of the NBBMA and landscape management of the SADA.

6.6.17 During the operational phase, disturbance or displacement could occur through the development delivering increased public access to the land; however, this is considered likely to be comparable to the current farming related activity levels and recreational activities, which include unregulated fishing within the NBBMA (Canal Pools area).

6.6.18 Replacement of components will cause temporary disturbance and displacement throughout the operational lifespan. Disturbance and displacement are likely to be similar to that of the construction phase. However, this will be periodic across the Proposed Development lifetime.

Disruption of flight paths of qualifying bird species due to glint and glare

6.6.19 During the operational phase, solar PV panels could introduce glint and glare, potentially disrupting flight paths of qualifying bird species associated with the European sites.

7.0 SCREENING ASSESSMENT

7.1.1 The European sites considered for assessment in the case of the Proposed Development have been identified through desk study as presented in Table 7-1, which sets out the Stage 1 HRA screening assessment. Table 7-1 identifies each European site, the relevant impact pathways, project phases, and qualifying features, and records whether a Likely Significant Effect can be excluded without reliance on mitigation. Where impact pathways cannot be ruled out at screening stage, these are screened in and taken forward for further consideration, with a detailed explanation of the screening conclusions provided in the sections below.

7.1.2 Each European site is then discussed in turn (Sections 7.2 and 7.3), with consideration of all phases of the Proposed Development.

Table 7-1. Screening assessment.

Impact Pathway	Project Phase	Impact Source (Area)	Receptor Area	European Site / Feature Affected	Screening Outcome	Notes
Loss of FLL	Construction	SADA	SADA	Mersey Estuary SPA and Ramsar - qualifying features and waterbird assemblage	Screened in	Temporary loss during clearance and enabling works.
	Construction	NBBMA	NBBMA	Mersey Estuary SPA and Ramsar - qualifying features and waterbird assemblage	Screened in	Temporary loss during reengineering of the area (Cell 3 only) for enhancement
	Operational	SADA	SADA	Mersey Estuary SPA and Ramsar - qualifying features and waterbird assemblage	Screened in	Long-term conversion of FLL due to Proposed Development
Disturbance / Displacement	Construction	SADA	NBBMA (already operational)	Mersey Estuary SPA and Ramsar - qualifying features and waterbird assemblage	Screened in	NBBMA operational during SADA construction; potential disturbance and displacement.
	Construction	NBBMA	NBBMA	Mersey Estuary SPA and Ramsar - qualifying features and waterbird assemblage e	Screened in	Initial disturbance during re-profiling, fencing, and scrape creation (Cell 3 only).
	Operational and decommissioning	SADA	NBBMA and SADA	Mersey Estuary SPA and Ramsar - qualifying features and waterbird assemblage	Screened in	Increased access to the land is anticipated through the development design, however the extent of this disturbance is considered to be of similar magnitude to what the land currently experiences. Replacement of components could be similar or less to the construction and decommissioning phase intensity.
Water Quality Degradation	Construction	SADA and the NBBMA	NBBMA	Mersey Estuary SPA and Ramsar - qualifying features and waterbird assemblage	Screened in	Potential for runoff of sediment/pollutants into NBBMA/SADA/Mersey Estuary SPA/Ramsar through excavation, maintenance and component replacement activities.

Impact Pathway	Project Phase	Impact Source (Area)	Receptor Area	European Site / Feature Affected	Screening Outcome	Notes
	Construction	SADA	SPA/Ramsar via hydrological connections	Mersey Estuary SPA and Ramsar - qualifying features and waterbird assemblage	Screened in	Potential indirect runoff through ditches; mitigation proposed.
	Operational and decommissioning	SADA	SPA/Ramsar via hydrological connections/NBBMA	Mersey Estuary SPA and Ramsar - qualifying features and waterbird assemblage	Screened in	Potential for runoff of sediment/pollutants into NBBMA/SADA/Mersey Estuary SPA/Ramsar
Air Quality	Construction	SADA	Habitats which support SPA features	Mersey Estuary SPA and Ramsar - qualifying features and waterbird assemblage	Screened in	Low emissions; effective dispersion and in-design controls (oCEMP).
	Operational and decommissioning	SADA	Habitats which support SPA features	Mersey Estuary SPA and Ramsar - qualifying features and waterbird assemblage	Screened in	Passive land use with no material emissions, although dust to be managed during maintenance activities.
Glint and Glare	Operational	SADA (solar panels alone)	Overflying SPA/Ramsar features	Mersey Estuary SPA and Ramsar - qualifying features and waterbird assemblage	Screened in	Possible interference with flight paths between SPA and SADA.
All Potential Pathways (loss of FLL, disturbance and displacement, water quality degradation and air quality)	All phases	N/A	Midland Meres & Mosses Ramsar Ph. 1 & 2 (>6 km)	Midland Meres and Mosses Ramsar Phase 2 & 2 – all qualifying features (fen/bog habitats, flora, inverts)	Screened out	No hydrological or air quality link; no supporting bird usage evidence.

7.2 Midland Meres and Mosses Phase 1 & 2 – all phases

7.2.1 The Midland Meres and Mosses Phase 1 and Phase 2 Ramsar sites are split into multiple units throughout Wrexham, Shropshire, Cheshire and Staffordshire Plain. The majority of the units are in Cheshire and north Shropshire, with a small number of outlying sites in adjacent parts of Staffordshire and Wrexham. Each Ramsar site is discussed and screened in turn below.

Midland Meres Phase 1

7.2.2 Midland Meres Phase 1 is underpinned by 16 SSSIs and the closest unit of the Ramsar site is located approximately 6.8km away from the Proposed Development. The site is designated for higher plants, invertebrates due to peat accumulation and open waterbodies.

7.2.3 Although the Ramsar site is hydrologically connected to the Weaver Lower operational catchment, the relevant watercourses ultimately discharge into the Mersey Estuary and the Manchester Ship Canal. As a result of this downstream flow, there is no hydrological impact pathway linking the Proposed Development to the Ramsar site and or its underpinning units (see Figure 7d).

7.2.4 Given the separation distance of 6.8 km, there is no functional or ecological connectivity between the Proposed Development and the designated sites qualifying features (namely plants and invertebrates). The development will not result in direct or indirect habitat loss, fragmentation, or changes to hydrology, air quality, or other ecological processes that support the invertebrate and higher plant qualifying features.

7.2.5 On this basis, there is no risk of LSE to the Midland Meres and Mosses Phase 1 Ramsar site. These European sites can be screened out of further consideration.

Midland Meres Phase 2 Ramsar Site

7.2.6 The Midland Meres and Mosses Phase 2 Ramsar site is underpinned by 15 SSSI units, with the closest unit located approximately 8 km from the Proposed Development. The Ramsar designation includes higher plant species, invertebrates, and bird's species, including shoveler, water rail, bittern and cormorant. As with Phase 1, higher plants and invertebrates are screened out due to the absence of any

plausible impact pathways. Additionally, there is no hydrological connectivity between the Proposed Development and any of the Ramsar units within 20 km (see Figure 2d), ruling out waterborne effects on and connections to designated features.

Designated Bird Features

7.2.7 Within 20 km of the Proposed Development, three areas with waterbodies form part of the Midland Meres and Mosses Phase 2 Ramsar site designation (Figure 7d). The closest is Linmer Moss, which is not identified as a priority site under the BTO Wetland Bird Survey (WeBS) criteria.[39] The adjacent Blakemere Moss waterbody (WeBS sector 450A3), which lies outside of the Ramsar site, reports a 5-year mean of only seven shoveler individuals and no records of cormorant or water rail. The count sector is classified as lower priority under WeBS criteria.

7.2.8 Oak Mere (45031) and Nunsmere GP Lewis's Pit Cuddington (45211) also fall within the Ramsar network within 20 km of the Proposed Development and have no WeBS records of shoveler, cormorant, or water rail and are similarly classified as 'Lower Priority'. Sandiway Big and Small Pools (45212), located approximately 100 m from Nunsmere but not part of the designated Ramsar boundary, supports a low 5-year mean of three shoveler, two cormorant, zero water rail and bittern records. These low and infrequent counts confirm that none of these sites serve as functionally important areas for these bird species in proximity to the Proposed Development. Qualifying species are further discussed separately below.

Shoveler

7.2.9 Shoveler were recorded within the Proposed Development Site during the non-breeding bird surveys over all three years. In Year 1, they were observed in low numbers, with a peak of two individuals in April. In Year 2, numbers ranged from four to 38 individuals, while in Year 3, up to 77 individuals were recorded in November (winter). Shoveler were present throughout the non-breeding period and were not limited to autumn or spring passage. Most sightings occurred within Cell 3, which is to be retained and enhanced as part of the Proposed Development and therefore

[39] *British Trust for Ornithology (BTO) (n.d.) Vacant survey sites map. Available at: https://app.bto.org/websonline/sites/vacant/vacant-sites.jsp (Accessed: 7 July 2025).*

this species will not be impacted and will benefit from the enhancements created (see Table 6-2).

7.2.10 Although shoveler is a qualifying species of the Ramsar designation, this is based on populations recorded at Aqualate Mere, located approximately 62 km from the Proposed Development, where the 5-year WeBS mean count is 64 individuals. There is no evidence that the Mersey Estuary functions as supporting habitat for this population during the passage period. The Mersey Estuary is not cited within the Ramsar site documentation, nor is there any known ecological, migratory, or foraging linkage between it and Aqualate Mere or other component SSSIs within 20 km. Whilst shoveler is a long-distance migrant, its movement patterns between U.K. wetland sites remain poorly understood[40] . Available evidence suggests that the largest concentrations during passage occur at Mid-Cheshire meres such as Arley (17 km), Tabley (> 20 km) and Rostherne (> 20 km)[41], which are located beyond areas searched for long distance travelling species such as geese and swans. There is no evidence indicating that the Mersey Estuary or surrounding area (including the Site) is functionally important for the Ramsar population.[42] Therefore, shoveler is not at risk of potentially significant effects and is screened out.

Water rail

7.2.11 Water Rail were recorded on two occasions during the Year 3 non-breeding bird surveys, once in October and the other record was made in December, with a single individual observed on each occasion. One of these individuals was recorded using Cell 3, which is to be retained and enhanced as part of the Proposed Development. Given the limited number of observations throughout the three years of surveys, and the planned habitat enhancements within Cell 3, no adverse impacts are anticipated. The species is expected to benefit from the improved habitat conditions created by the NBBMA.

[40] *Chris Wernham, Mike Toms, John H Marchant, Jacquie Clark, Gavin Siriwardena, Stephen R Baillie. 2002. The Migration Atlas: Movements of the Birds of Britain and Ireland. British Trust for Ornithology*
[41] *Cheshire and Wirral Ornithological Society (n.d.) Shoveler wintering. Available at: http://www.cheshireandwirralbirdatlas.org/species/shoveler-wintering.htm (Accessed: 7 July 2025).*
[42] *NatureScot (2022) Assessing connectivity with Special Protection Areas (SPAs). Available at: https://www.nature.scot/sites/default/files/2022-12/Assessing%20connectivity%20with%20special%20protection%20areas.pdf (Accessed: 7 July 2025).*

7.2.12 The Cheshire Bird Atlas[43] contains only two isolated records of single water rail individuals on the Mersey, further confirming the lack of significant populations, functional connectivity between the Proposed Development and any significant water rail habitat[44]. On this basis, potentially significant effects on water rail are screened out.

Bittern

7.2.13 Bittern were not recorded throughout the three years of surveys within the Proposed Development Site.

7.2.14 There are no records of bittern wintering within the Proposed Development boundary or its immediate surroundings. Furthermore, there are no records of this species associated with any of the waterbodies or relevant habitats to the species located within or adjacent to the Midland Meres and Mosses Ramsar units within 20 km of the Proposed Development. The closest known record (beyond the Ramsar units) is at Moore Nature Reserve, located approximately 9.5 km to the west. This site is a managed wetland specifically designed to support reedbed-dependent species.[45]

7.2.15 Bittern is a secretive species strongly associated with extensive, undisturbed reedbeds, particularly stands of *Phragmites australis*, which provide essential nesting and wintering habitat. There are no extensive reedbeds within the Proposed Development Site, although there are some smaller reedbeds present which will be retained and enhanced as part of the Proposed Development; however there are no known records of bitterns using these and therefore impacts on bitterns are not anticipated.

7.2.16 In the absence of records, evidence, or functional connectivity to designated sites that support bittern as a qualifying feature, there is no credible pathway for likely significant effects.

[43] *uest, J.P. & Cheshire and Wirral Ornithological Society (1992) The Breeding Bird Atlas of Cheshire and Wirral. Cheshire and Wirral Ornithological Society. ISBN 095173010X.*
[44] *Cheshire and Wirral Ornithological Society (n.d.) Water Rail wintering. Available at: http://www.cheshireandwirralbirdatlas.org/species/water-rail-wintering.htm (Accessed: 7 July 2025)*
[45] *Cheshire and Wirral Ornithological Society (n.d.) Bittern wintering. Available at: http://www.cheshireandwirralbirdatlas.org/species/bittern-wintering.htm (Accessed: 7 July 2025).*

7.2.17 As such, potentially significant at effects to bittern are screened out of further assessment.

Cormorant

7.2.18 Cormorant were not recorded using the Order Limits throughout the three years of surveys within the Proposed Development Site.

7.2.19 Cormorant is listed as a feature of the Ramsar site, though it is not a reason for SSSI notification for any of the 15 component units. Within the WeBS sectors closest to the Proposed Development, no significant numbers of cormorant have been recorded, with only two individuals observed at Sandiway Pools across a five-year period. Additionally, there are no known significant roosts or foraging areas for this species within or immediately surrounding the Proposed Development Site.

7.2.20 Further, cormorant are known to occur in high numbers within the Dee Estuary, located well beyond the zone of influence (> 20 km), with recorded counts of up to 700 individuals.[46] There is no evidence to suggest any functional use of the Proposed Development area by the designated cormorant population, and the habitats within the development footprint are considered generally unsuitable for the species as it requires deeper water. Therefore, significant impacts on cormorant can be screened out of further assessment within this HRA.

Screening Conclusion - Midland Meres and Mosses Phase 1 & 2 – all phases

7.2.21 In conclusion, there are no credible impact pathways either direct or indirect linking the Proposed Development to any of the qualifying features of the Midland Meres and Mosses Phase 2 Ramsar site.

7.2.22 All relevant threats and pressures to the Ramsar sites namely pollution, invasive species, and eutrophication have all been considered. Due to the separation distance from the Proposed Development and the absence of any hydrological connectivity (with all local watercourses draining away from the Ramsar sites toward the Mersey

[46] *Cheshire and Wirral Ornithological Society (n.d.) Cormorant wintering. Available at: http://www.cheshireandwirralbirdatlas.org/species/cormorant-wintering.htm (Accessed: 7 July 2025).*

Estuary and Manchester Ship Canal), there are no plausible pathways through which these pressures could affect the designated features of those Ramsar sites.

7.2.23 On this basis, both Ramsar sites can be confidently screened out of further consideration.

7.3 Mersey Estuary SPA and Ramsar Site – all phases

Designated features

7.3.1 The Mersey Estuary SPA and Ramsar site qualifies for its internationally important assemblage of waterbirds, regularly supporting over *c.* 104,000 individuals, consistent with the citation. However, it is important to note that the WeBS Mersey Estuary most recent up to date information suggest this is now well above 100,000 individuals.[47] The SPA is designated for internationally important overwintering populations of shelduck, teal, pintail, shoveler, redshank, dunlin, black-tailed godwit and golden plover, with additional regularly occurring waterbird species including pink-footed goose, wigeon, gadwall, mallard, lapwing, curlew, avocet and others contributing to the overall assemblage feature. These species and associated habitats are considered individually in the assessment of potential effects on site integrity.

7.3.2 Based on baseline study results (Section 5), Mesey Estuary SPA and Ramsar features taken forward to the Appropriate Assessment (AA) stage comprise the following individually listed qualifying species:

i) Golden plover
ii) Black-tailed godwit
iii) Pintail
iv) Teal

7.3.3 Additional species considered as part of the waterbird assemblage, based on baseline survey results, and taken forward as part of the assessment comprise:

i) Wigeon
ii) Curlew
iii) Lapwing
iv) Wider Assemblage Species recorded in very low to negligible numbers (see next paragraph).

[47] *BTO (2025) Mersey Estuary SPA WeBS data*

7.3.4 Across the survey period, a range of additional waterbird assemblage species (including shelduck- qualifying species, gadwall, shoveler, mallard, tufted duck, redshank, dunlin- qualifying species, little egret, pink-footed goose, whooper swan, ruff, mute swan, greylag goose, common snipe, great-crested grebe and water rail) were recorded within the Order Limits. Although most occurred only sporadically and generally in low numbers (Table 5-2), several are components of the SPA/Ramsar waterbird assemblage and therefore cannot be screened out.

7.3.5 Isolated exceedances of the 1% threshold occurred only where SPA thresholds are exceptionally low (typically <1 bird) and do not indicate sustained or significant use of the SADA or Cell 3. Nevertheless, given their inclusion within the wider assemblage feature of the Mersey Estuary SPA/Ramsar site, these species are screened in collectively for the Appropriate Assessment.

7.3.6 Potential effects on this group are assessed at assemblage level, and no species-specific AA is considered necessary. Assemblage feature effects will also be considered in the context of the supporting role of the NBBMA and the wider additive habitat mitigation and enhancement measures proposed within the Order Limits.

Air Quality and Construction Dust

7.3.7 Airborne emissions from the Proposed Development could, in principle, affect nearby designated sites via two distinct pathways:

i) Construction dust (course particulate matter generated from site activities during the construction, operational and decommissioning phases); and
ii) Air quality pollutants such as Sulphur Dioxide and Nitrogen Dioxide (other fine particulate matter such as ammonia, non-methane volatile organic compounds (PM_{10} and $M_{2.5}$[48])) particularly from plant and vehicle emissions, all of which can arise from construction, operation and decommissioning phases. Assessments for these were based on Background Air Quality Data from Defra[49] and CWACC

[48] *Particles with an aerodynamic diameter below 10µm (referred to as 'PM10') correspond to the inhalable fraction of particulate matter. Those with a diameter of less than 2.5µm ('PM2.5')*
[49] *Department for Environment, Food & Rural Affairs (Defra) (2019) Clean Air Strategy 2019. [Online] Available at: https://www.gov.uk/government/publications/clean-air-strategy-2019 (Accessed: 3 July 2025)*

ambient air quality monitoring (outdoor air and which excludes workplaces where members of the public do not have regular access).

7.3.8 While the **ES Vol 2 Appendix 4-2: Construction Dust Assessment [EN010153/DR/6.2]** assesses air quality and dust impacts, it is limited to the construction phase and focuses solely on dust emissions. However, construction traffic has been reviewed separately and is not considered to present a significant air quality issue. This assessment describes a series of best practice mitigating measures which have been integrated into the **Outline Construction Environmental Management Plan [EN010153/DR/7.5] as updated in Examination**. For the operational and decommissioning phases, it is anticipated that similar activities and mitigation measures will apply, these are provided for in the **Outline Operational Environmental Management Plan [EN010153/DR/7.5] as updated in Examination** and the **Outline Decommissioning Environmental Management Plan [EN010153/DR/7.5] as updated in Examination**. The implementation of these mitigation measures (which are secured by virtue of the Requirements in Schedule 2 of the draft DCO), cannot be considered at the HRA screening stage.

7.3.9 Long-term monitoring data confirm that concentrations of particulate matter (PM_{10} and $PM_{2.5}$[50]) are consistently well below national air quality objectives. Predicted background levels for the Order Limits and surrounding 1km grid squares remain low and are expected to decline further between 2025 and 2029. There are no Air Quality Management Areas (AQMAs) within the vicinity of the Order Limits that relate to relevant pollutants of concern (PM_{10}, $PM_{2.5}$ or NO_2), and prevailing wind conditions are favourable for the dispersion of emissions away from sensitive ecological and ornithological receptors.

7.3.10 The Mersey Estuary SPA and Ramsar site is underpinned by the Mersey Estuary SSSI, which comprises extensive areas of saltmarsh and intertidal mudflats which support the qualifying features of interest. One of the conservation objectives of the SPA is to maintain the extent, distribution, and availability of supporting habitat for

[50] *Particles with an aerodynamic diameter below 10µm (referred to as 'PM10') correspond to the inhalable fraction of particulate matter. Those with a diameter of less than 2.5µm ('PM2.5')*

the non-breeding waterbird assemblage throughout the non-breeding bird period, including foraging, moulting, roosting, and loafing behaviours.[51]

7.3.11 These supporting estuarine habitats do not occur within the SADA and NBBMA, which comprises improved grassland and ephemeral pools. A very small section of the SSSI (~0.003 ha) overlaps the Order Limits boundary, but this area will be retained and protected through best practice and therefore, no direct impacts are anticipated. Furthermore, the principal estuarine habitats that support SPA features lie at a sufficient distance from any potential construction, operational and decommissioning phase emission sources to prevent meaningful pollutant deposition.

7.3.12 In addition, the Manchester Ship Canal is not considered FLL, and the presence of Frodsham Score' (an embankment on the estuary side of the Manchester Ship Canal) provides physical screening, establishing a functional buffer of approximately 250 m between the Proposed Development and the estuarine edge of the Mersey Estuary SPA/Ramsar. This separation reinforces the conclusion that no plausible air quality pathway exists between the source and the designated habitats or species of the Mersey Estuary.

7.3.13 However, further to the People over Wind ruling (CJEU Case C-323/17), as the conclusion of no likely significant effect depends on the implementation of embedded mitigation (e.g. dust suppression and controlled access), and such measures cannot be considered at the screening stage, it is concluded that an LSE cannot be ruled out at screening stage.

7.3.14 Airborne emissions (construction dust and air quality pollutants) will therefore be taken forward to the Appropriate Assessment, where the effectiveness of proposed mitigation will be assessed in relation to the conservation objectives of the Mersey Estuary SPA and Ramsar site.

[51] *Natural England (2014) Supplementary Advice for Mersey Estuary SPA. Natural England. Available at: https://designatedsites.naturalengland.org.uk/ConservationAdvice/SupplementaryAdvice.aspx?SiteCode=UK9005131&SiteName=mersey+estuary&SiteNameDisplay=Mersey+Estuary+SPA&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=7 (Accessed: 8 May 2025).*

Water Quality, Ground disturbance and Invasive Non-Native Species (INNS)

7.3.15 There is a potential hydrological link between the Proposed Development, FLL within the Order Limits, and the Mersey Estuary SPA and Ramsar site via on-site ditches, drains, and surface water pathways that connect to the River Weaver and the Manchester Ship Canal and ultimately the Mersey Estuary. During construction, there is a risk that fine sediments and contaminants (e.g. fuel, concrete washout, silt) could be mobilised via surface runoff and enter connected watercourses, leading to degraded estuarine water quality. Potential impacts through ground disturbance include increased turbidity, nutrient loading, and chemical contamination and mobilisation, particularly during the construction phase of the NBBMA and the foundation works across the SADA highlighted in **ES Vol 1 Chapter 10: Ground Conditions [EN010153/DR/6.1;** whereby activities may increase leachability of contaminants in soil or perched groundwater, which could impact habitat use and populations.

7.3.16 Although no direct works are proposed within SPA or Ramsar-designated waterbodies, the proximity of the Order Limits to these hydrologically connected receptors creates viable pathways for indirect effects. The **oCEMP [EN010153/DR/7.5]** includes embedded pollution control measures such as silt fencing, buffer zones, and pollution prevention protocols, which are expected to minimise risk, they cannot be relied upon at this screening stage.

7.3.17 In accordance with the People over Wind ruling (CJEU Case C-323/17), reliance on mitigation measures cannot be considered at the screening stage. Given the proximity, connectivity, and sensitivity of the receptor, there remains a credible pathway for significant effects on the Mersey Estuary SPA and Ramsar features via water quality degradation.

7.3.18 Invasive non-native species, notably NZPW, are present within the Order Limits (Canal Pools) and can contribute to water quality degradation through dense growth that reduces dissolved oxygen, alters nutrient cycling, and limits light penetration.[52] While the SPA is designated for bird species, such habitat changes can reduce

[52] *Smith, T. and Buckley, P. (2020) Biological Flora of the British Isles: Crassula helmsii. Journal of Ecology, 108(3), pp. 797-813. Available at: Wiley Online Library (Accessed: 2 May 2025).*

habitat suitability for waterbird foraging and roosting and are therefore acknowledged as a supporting habitat pressure under the water quality conservation objective.[53]

7.3.19 Water quality impacts are therefore screened in for further assessment at the AA stage.

Glint and Glare (Disruption of Flight Paths)

7.3.20 SPA and Ramsar sites support internationally important populations of waterbirds, some of which may regularly use terrestrial and freshwater habitats outside the designated boundary and therefore overfly the Proposed Development.

7.3.21 Solar photovoltaic panels can create solar reflections ("glint") that may be visible to overflying birds. In the absence of detailed data on flight lines between the Mersey Estuary SPA/Ramsar and FLL and the proximity of the Order Limits to known FLL, a precautionary approach has been taken.

7.3.22 Given the confirmed use of both the NBBMA and SADA by qualifying features and the waterbird assemblage during baseline surveys, desk-study data, and the anticipated loss or alteration of habitat function, the potential for LSEs on the Mersey Estuary SPA/Ramsar site cannot be excluded. This pathway is therefore screened in for further consideration in the Appropriate Assessment.

Disturbance and Displacement of Qualifying Bird Species and the Waterbird Assemblage

7.3.23 SPA and Ramsar qualifying features and waterbird assemblage are known to utilise areas within the SADA and NBBMA for foraging and (or) roosting.

7.3.24 During the construction, operational and decommissioning phases, both areas have the potential to experience increased human activity, noise, visual intrusion, lighting, vibration and general disturbance associated with enabling works and construction activities, including any temporary construction works associated with UXO risk management. It is also acknowledged that:

[53] *Best, M. A., Wither, A. W. and Coates, S. 2007. Dissolved oxygen as a physico-chemical supporting element in the Water Framework Directive. Marine Pollution Bulletin, 55, 53-64.*

i) The SADA will be subject to phased enabling works, site clearance, and infrastructure installation over an anticipated two-year construction period;
ii) The NBBMA, although constructed first to function as mitigation and enhancement habitat, may be exposed to indirect construction disturbance (e.g. vehicle movements, visual stimuli, lighting);
iii) During the operational phase, the NBBMA may experience indirect disturbance from maintenance and replacement works undertaken in the adjacent SADA which will be of similar magnitude of the construction phase and decommissioning phase;
iv) The NBBMA may also be subject to a level of disturbance during the operational phase (through conservation management); and
v) During decommissioning, similar activities may recur, although likely of shorter duration and intensity.

7.3.25 Although embedded measures such as fencing, timing restrictions, lighting controls, and a phased construction strategy will help aid to reduce disturbance levels, the proximity of these works to FLL and the regular presence of SPA/Ramsar species and the waterbird assemblage, mean that the potential for disturbance-related effects on qualifying features and the waterbird assemblage cannot be excluded.

7.3.26 This pathway is therefore screened in for further assessment at the AA stage.

Screening Conclusion - Mersey Estuary SPA and Ramsar Site – all phases

7.3.27 The Proposed Development is not directly connected with or necessary to the management of any European site. A screening assessment has therefore been undertaken to determine the potential for LSEs on European sites, alone or in combination with other plans and projects.

7.3.28 Based on the Order Limits proximity to the European Site, known species presence, hydrological connections, and the potential for indirect impacts, the Mersey Estuary SPA/Ramsar site has been screened into this assessment. Several pathways for potential LSE were identified, relating to:

i) Habitat Loss (Loss of FLL), both short (construction) and long-term (operational);
ii) Disturbance and Displacement of qualifying species and those part of the waterbird assemblage;
iii) Changes in water quality, ground conditions and INNS;
iv) Air Quality; and
v) Potential disruption of bird flight paths due to glint and glare (precautionary approach).

7.3.29 The above potential impacts are therefore carried through to Appropriate Assessment.

7.4 Summary of Stage 1

Table 7-2. The summary of the Stage 1 HRA outcome

European site	Qualifying features	Outcome of Stage 1	Next step
Mersey Estuary SPA and Ramsar site	Waterbird assemblage and qualifying species	Likely Significant Effects cannot be excluded	Taken forward to Appropriate Assessment
Midland Meres & Mosses Ramsar site(s) Phase 1 & 2	Fen, bog and open water habitats; flora, invertebrates, birds	No Likely Significant Effects identified	Screened out of further assessment

8.0 APPROPRIATE ASSESSMENT (STAGE 2)

8.1.1 This section sets out the information to inform the Appropriate Assessment (AA) for the Proposed Development, as required under Regulation 63 of the Conservation of Habitats and Species Regulations 2017 (as amended). The AA focuses on the potential for adverse effects on the Mersey Estuary SPA/Ramsar site, the only European site screened into the assessment, considering the Mersey Estuary SPA/Ramsar site conservation objectives.

8.1.2 The AA stage of the HRA evaluates whether the Proposed Development, either alone or in combination with other plans or projects, is likely to result in any adverse effects on the integrity of the European site.

8.1.3 The AA considers all relevant phases of the Proposed Development including the construction, operation, and decommissioning phases and reflects the phased delivery approach, whereby the NBBMA will be established and functional prior to construction commencing in the SADA.

8.1.4 All habitat creation and management measures associated with the NBBMA are set out in the **Outline Non Breeding Bird Mitigation Strategy (oNBBMS) [EN010153/DR/8.32] as updated in Examination** which is secured and will be required to be implemented via a Requirement of the DCO.

8.1.5 Mitigation for the Proposed Development is detailed in full in the oNBBMS. This includes a full description of the approach to, and extent and deliverability of, mitigation for all SPA birds recorded within the Order Limits. The oNBBMS further details the approach to management of the NBBMA during the operational phase of the Proposed Development and monitoring of its efficacy, and importantly the adaptive management approach that would be taken. Information on relevant components of the oNBBMS is referred throughout the AA where appropriate and relevant to the effects under discussion.

8.1.6 The effects arising from the Proposed Development will be separate to, and in addition to, those already arising from the FWF. Accordingly, the oNBBMS has been developed cognisant of this additional impact, and of the approved and functioning mitigation for FWF. The measures proposed within the oNBBMS are therefore provided in addition to those already implemented. This approach is subsequently

termed 'additive mitigation', which is best summarised as a 'quality over quantity' approach.

8.1.7 The oNBBMS will be developed into a full plan (the NBBMS) which must be in substantial accordance with the outline and will require approval by CWACC in consultation with Natural England and the RSPB. The Proposed Development must be undertaken in accordance with the approved plan. This is secured via a Requirement in Schedule 2 of the draft DCO.

8.1.8 The Application also recognises the legal obligations on landowners with regards to Site of Special Scientific Interest (SSSI) set out in the Wildlife and Countryside Act 1981 (as amended), specifically in Sections 28A – 28S, which imposes legal obligations on landowners with regards to SSSIs to ensure they manage the SSSI to favourable condition. The measures set out in the oNBBMS will support the restoration and management of that part of the SSSI which is located within the NBBMA. This is in the context that it is considered that the management of the SSSI to enable its restoration fully accords with and compliments the principles of the oNBBMS. For the avoidance of doubt, mitigation for the Proposed Development is not proposed for, or derived from, enabling the restoration or management of the SSSI.

8.1.9 Two options have been proposed by the Applicant for the re-engineering of Cell 3. These have been provided to enable alternative potential environmental permitting approaches to be taken in relation to the management of the soils that would be re-engineered from Cell 3 (this does not include Cell 2). The preferred approach, will be to drain the ponds, treat the base and sides of the ponds with herbicide, fill the ponds in and re-create ponds within the boundary of the SSSI (in a similar location to the current eastern ponds). This approach will maximise the success outcome of NZPW eradication. This option will be used when assessing impacts as this is considered the worst-case scenario, i.e., that with the maximum level of potential for disturbance impact due to the longer construction period in an elevated (and therefore highly visible) position, which is within the SSSI and at the closest point to both the SPA and areas currently used by SPA birds within the Western SADA. However, the differences in programme and potential for impacts are very similar for both options and there is unlikely to be a substantive difference in overall effect under either option each potential impact pathway identified during screening is assessed in turn,

incorporating both embedded design measures and additional mitigation, with conclusions drawn based on the available evidence.

8.1.10 Where qualifying species are shared between the SPA and Ramsar designations, these are considered together, in line with guidance and policies.

8.2 Habitat Loss (Loss of FLL): Construction and Operation

8.2.1 Habitat loss within the Order Limits primarily affects sub-optimal agricultural land, while the areas that most consistently support regularly occurring SPA species (i.e. grassland and wetland features within the NBBMA (Cell 2 and Cell 3) will be fully retained, enhanced and made available earlier than any losses occur. However, there will be some loss of habitats the wider Order Limits (Western and Eastern SADA).

8.2.2 The oNBBMS has been designed on the assumption that the entire Order Limits is FLL or has the potential to be FLL. The Proposed Development therefore has the potential to impact on FLL to the Mersey Estuary SPA and Ramsar, through:

i) Displacement of SPA species due to the presence of solar panels and other infrastructure; and/or,
ii) Increased disturbance to SPA species during construction, operation and decommissioning of the Proposed Development.

8.2.3 Construction of the SADA will result in the long-term loss of sub-optimal agricultural habitats, including arable fields and improved grassland. While neither of these habitats are cited within the Mersey Estuary SPA's SACOs[54], these habitats and areas are acknowledged as functionally important as supplementary foraging and roosting areas for qualifying features and the waterbird assemblage.

8.2.4 Temporary habitat loss will occur during initial works in the NBBMA, including reprofiling and habitat creation. These works are programmed to be completed

[54] *Natural England (2025) 'Supplementary Advice for Mersey Estuary SPA'. Available at: https://designatedsites.naturalengland.org.uk/ConservationAdvice/SupplementaryAdvice.aspx?SiteCode=UK9005131&SiteName=mersey%20estuary&SiteNameDisplay=Mersey+Estuary+SPA&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=7 (Accessed: 8 May 2025).*

before any loss of land within the SADA to wetland birds, as the NBBMA will be functional prior to commencement.

8.2.5 NBBMA works are anticipated to require a maximum of nine months from commencement to completion and may be completed within 6 months. Construction of the NBBMA will be focussed outside the peak sensitive period for non-breeding birds (i.e., undertaken between March and October inclusive).

8.2.6 During construction of the NBBMA, alternative habitats for SPA birds will be available through:

i) All habitats within the SADA, including grasslands managed for golden plover, lapwing and curlew (as a requirement of FWF mitigation) and the Lum area.
ii) Adjacent wetland habitats, including Cell 6 (and which is ensured for continued use as wetland until 2042 under FWF planning conditions) and the River Weaver.

8.2.7 As such, impacts on SPA species through the construction of the NBBMA are largely avoided through timing, or will take place over the very short term (part of spring and/or autumn passage) and therefore de minimis.

8.2.8 To ensure that habitat is available for SPA species throughout the construction period, there will be no other construction works within any part of the Order Limits until construction of the NBBMA are completed and functional. For the purposes of the ONBBMS, 'functional' has been defined in agreement with Natural England as follows:

i) All physical works within the NBBMA are completed;
ii) The entire NBBMA area is available to support SPA bird species for which it is designed; and
iii) The entire NBBMA is free from construction-related disturbance

8.2.9 This phasing ensures that a substantial proportion of FLL remains available to qualifying bird species and the waterbird assemblage during construction. The NBBMA will be functionally operational by the time works progress across the broader SADA footprint. This approach is considered to adequately mitigate

construction-related habitat loss across all phases of the construction period. It is further relevant that other habitats within and outside the Order Limits will continue to be available for SPA birds during construction, most notably The Lum, Cell 6 and the River Weaver (but not limited to).

8.2.10 Operational loss of FLL occurs within the SADA over the lifetime of the Proposed Development. Mitigation is provided through the construction and subsequent conservation management of the NBBMA.

8.2.11 The approach to mitigation for FLL loss during the operational phase is deemed 'additive', whereby additional measures above those already enacted under FWF are implemented. These are summarised as:

i) The retention and management of Cell 2 and the provision of improved quality foraging and roosting habitats for SPA species through the complete re-engineering of Cell 3 and the Canal Pools area, leading to the creation of a mosaic of optimised habitats comprising grassland, wet grassland and additional scrapes with extensive wet edges and which is considerably higher quality than is currently delivered, or required to be delivered, by FWF. This will ensure that mitigation above that already in place for FWF is delivered, and therefore FWF mitigation measures continue to be provided.

ii) On-going adaptive conservation management of the NBBMA for at least the operational lifetime of the Proposed Development, and FWF which is above any management already in place under FWF. Management is intended be under the control of a recognised, and suitably experienced nature conservation organisation. Conservation management of the NBBMA will extend beyond that in place under FWF by an anticipated 28 years (assuming a 40-year period of operation of the Proposed Development from 2030, with the FWF decommissioning required in 2042);

iii) Extending the seasonal availability of existing FWF mitigation in the NBBMA to include the autumn passage and spring passage periods for waterfowl and waders. This will be achieved by reducing soil permeability and through on-going dynamic water management; and

iv) Reduced disturbance of SPA species across the NBBMA through the removal of uncontrolled recreational fishing of the Canal Pools.

8.2.12 It is considered that, with the provision of habitat and management, the above measures will ensure at least current levels of on-site resources are available for all Mersey Estuary SPA species recorded within the Order Limits, through the delivery of higher quality foraging habitats (particularly wet grassland and scrapes).

8.2.13 'Bird-day' calculations (BDCs) have been undertaken to assist in determining the extent of mitigation area required as part of the NBBMA to ensure the integrity of the SPA and Ramsar is maintained. Full bird day calculation results are presented in Annex 1 of the oNBBMS. However, consistent with Natural England guidance, the overall assessment and results of BDCs should be read as a broad indicator of scale only, as they do not consider habitat quality or the effect of habitat improvements. It is considered that BDCs under-predict the carrying capacity of the NBBMA because they are based on mean utilisation of predominantly dry agricultural land/dry grassland and do not account for key habitat-quality multipliers such as water permanence, high invertebrate availability, soft soils, shallow wet features or security from disturbance. Furthermore, the NBBMA will be managed dynamically to optimise habitats quality and extend the seasonal availability of habitats. As such, BDC results should be treated as a broad indicator and considered alongside these other aspects of the oNBBMS when determining the adequacy of the mitigation area.

8.2.14 BDCs for Years 2–3 indicate that compensating the entire Order Limits, including Cell 2 and Cell 3 current use, and using average-quality grassland, would require 59–63 ha of land without additional habitat enhancements. However this is a broad indication only.

8.2.15 The NBBMA delivers 70.81 ha of optimised, hydrologically managed wetland and dry grassland designed around the demonstrated preferences of golden plover, lapwing, teal, black-tailed godwit and other SPA and assemblage species. It is considered that one hectare of optimally managed wetland provides disproportionately higher carrying capacity than one hectare of arable / improved or managed grassland due to its non-linear ecological value. There is no agreed metric that exists to calculate what the non-linear habitat enhancements and additive mitigation being implemented as part of the NBBMA design contribute but it is accepted that creation of wetland habitats, opposed to average-quality grassland, demonstrably increases carrying capacity by providing an enhanced food resource for non-breeding birds, as noted through the observations on the site in relation to curlew at paragraph

5.3.42.To fully determine how the existing habitats on Cell 3 function, and to establish the potential for the creation of optimised habitats, Ground Investigation (GI) works and a 'Water Balance Model' for Cell 3 have been undertaken by the Applicant. Full reports are provided as Annex 3 and Annex 4 (respectively) to the oNBBMS.

8.2.16 The GI report concludes that optimal wet grassland and scrapes could only be provided in Cell 3 if the cell is re-engineered to retain water, and that sufficient water is made available to manage water levels favourably. Current ground conditions and elevations preclude any additional water retention measures or wet grassland creation as the surface layers of the cell comprise sandy deposits which do not readily retain water. The GI has identified layers of low permeability material at depths of approximately 0.8m below ground level, where perched water has been recorded. It is considered relevant that there is no provision in the FWF mitigation requirements that would enable improvement of water table or re-engineering of soils within Cell 3.

8.2.17 The Water Balance Model, based on the proposed design of the NBBMA (Figure 3 of the oNBBMS), was used to calculate how much water the NBBMA will typically gather through rainfall, which is relevant to the viability of the mitigation management.

8.2.18 The Water Balance Model was developed to represent the baseline case and was calibrated to observed data from Cell 3. The model shows that the NBBMA is likely to remain generally wet throughout the year, with seasonal variations in water levels driven by rainfall and evaporation. There is sufficient water to maintain saturated conditions over the wet grassland area for up to 6 months of the year under average conditions. Even in a dry year, the wet grassland soils are expected to be near saturation for at least 2 months. The deeper scrapes will retain water year-round. Occasional overspill into the site drain is simulated during the wetter months, demonstrating surplus water that could be retained to maintain wetness. The model further considers the possible effects of climate change, concluding that it should be possible to mitigate some of the effects of drier summers by actively managing the site to retain more water during the autumn and spring, which should enable the mixture of ponds and wet grassland to be maintained.

8.2.19 Combined, the GI works and Water Balance Model provide confidence that the relatively dry conditions typically experienced on Cell 3 due to the prevailing

geotechnical properties of the soils can, through re-engineering, be modified to allow a large area of wetland habitats to be created on Cell 3, and that optimal management of the NBBMA can be delivered over the operational lifetime of the Proposed Development.

8.2.20 The NBBMA will introduce actively managed, hydrologically controlled wet grassland with soft, penetrable soils, high invertebrate availability and dry grassland (Cell 2), which are characteristics known to support foraging waders and waterfowl. The NBBMA therefore provides a long-term secure, reliable and considerably higher-quality inland refuge than the land being lost to the Proposed Development, and which is considerably above any measures which can be delivered by FWF.

8.2.21 It is acknowledged that a small part of the NBBMA, specifically the eastern "panhandle" area located between Cell 3 and Marsh Farm, is of comparatively lower habitat quality than the remainder of the NBBMA (figure 3 of Non-Breeding Bird Mitigation Strategy (oNBBMS) [**EN010153/DR/8.32**]). Notwithstanding this, the area remains suitable as foraging habitat for grassland waders, including curlew, golden plover, and lapwing. The area comprises a raised, flat grassland surface with an open aspect towards the estuary, which is a characteristic favoured by these species. Furthermore, the removal of trees between this area and the Canal Pools, with subsequent replacement by grassland, will increase openness and improve visual connectivity, thereby enhancing its suitability for these species. In conclusion, the approach to mitigation is therefore based on maintaining and enhancing the functional conditions that support SPA species, rather than replacing land on a hectare-for-hectare basis.

8.2.22 Additional areas of mitigation within the Order Limits are also provided at the Lum, and the Biodiversity Enhancement zone adjacent to the NBBMA boundary. Both of these areas will be managed to create habitats which are suitable for SPA birds. The long-term management prescriptions shall be determined as part of the approval of the detailed LEMP.

8.2.23 On-going conservation management of the NBBMA is secured through this management strategy and its implementation pursuant to a Requirement 9(2)(j) of the draft DCO.

8.2.24 Management measures will remain in place for the lifetime of the Proposed Development. All costs associated with on-going management will be borne by the Applicant, including the costs of CWaCC, Natural England and RSPB in engaging in the development of the NBBMS and involvement in on-going monitoring (including a steering group).

8.2.25 It is intended that the NBBMA will be managed by a suitably experienced and nature conservation organisation, who will control management of the NBBMA. Management will be separated from that undertaken in the SADA or wider Site (i.e., all areas of the Order Limits excluding the NBBMA). experienced personnel will be employed and / or contracted-to by the Applicant.

8.2.26 Management will require regular visits and adaptive action, based on conditions at the time. As such management will be on-going, requiring regular visits and (where necessary) actions throughout the year. Management actions will include, but not be limited to, control of water levels, livestock grazing (or cutting), island maintenance and the general upkeep of the NBBMA to ensure the stated Aims and Objectives of the oNBBS are met.

8.2.27 Measurable targets will be set to ensure the NBBMA is functioning. As bird populations fluctuate and are subject to numerous environmental factors which are not able to be controlled, it is envisaged that measurable targets will be based on extent of habitat area and hydrological function. Notwithstanding this, bird usage of the NBBMA will be monitored as part of the oNBBMS to confirm that the mitigation area is being utilised by target bird assemblages i.e. qualifying species and those part of the wider waterbird assemblage. Full details will be agreed and presented in the detailed NBBMS.

8.2.28 As a result of this, an adaptive management plan will be finalised as part of the detailed NBBMS which will include remedial actions where performance objectives are not being met, which will be reviewed and led by the appointed conservation organisation responsible for the management of the NBBMA. These actions may include modifying management prescriptions, adjustments to grazing and (or) the identification and delivery of additional mitigation measures, if required. The outcomes of ornithological monitoring will be reviewed alongside habitat and hydrological performance data within this adaptive framework.

8.2.29 The adaptive framework therefore will provide flexibility to respond to unforeseen ornithological responses and ensures all conservation objectives are met over the operational lifetime.

8.2.30 The FWF mitigation within Cell 3 and Cell 2 forms part of the existing ecological baseline. Although established under the FWF HCMP, its effectiveness is limited by variable water availability, vegetation growth and the absence of hydrological control. The NBBMA has been designed to add to rather than rely on this baseline, providing greater habitat capacity and functional diversity for SPA species. Understanding current usage and constraints in Cell 2 and Cell 3 is therefore essential to defining the additional mitigation required and ensuring the NBBMA delivers a more reliable and resilient wetland system that strengthens, rather than duplicates, the existing baseline. Table 8.1 below is provided to compare the current habitats with those which will be delivered under the oNBBMS.

Table 8-1. FWF current baseline habitats and conditions (Before (under existing FWF HCMP) and After (proposed additive mitigation measures delivered under the oNBBMS)

Feature	Before (Cells 1, 5 + existing Cell 3 and 2/NBBMA)	After (NBBMA – 70.81 ha)
Hydrology	Uncontrolled. wet features rainfall reliant and dry out regularly	Fully engineered water control system throughout the entirety of the year
Wet Grassland	Scarce, inconsistent, unpredictable and fully reliant on rainfall	~9.5 ha actively managed wet grassland
Dry Grassland (retained within Cell 2)	Intermittently managed	Actively managed to a high standard
Proposed grassland	Intermittent management	~45.84 ha of actively managed grassland
Scrapes / Muddy Edge	Limited to existing FWF scrapes small	Expanded network of scrapes with high muddy-edge ratio
Vegetation	Uncontrolled- nettles and grassland management is intermittent	Controlled and managed daily to tailor to species needs
Roosting Areas	None (except Canal Pools)	islands + secure roost habitat
Prey Availability	Assumed to be low based on the scattered dry patches of grassland and distribution of bird species	High (wet soil, invertebrates)
Disturbance	Agricultural activity; exposed; unmanaged recreational activity	Predator fencing + controlled recreational access
Bird Use	Low and sporadic; except Cell 3	High, predictable, extended season
Functional Value	Sub-optimal	Enhanced; reliably supports SPA species
Longevity	Unmanaged and periodically maintained	High, on-demand active management with wetland experience and consistent monitoring

The Lum and the Biodiversity Enhancement Area
Enhancements to the retained main water features across the SADA (ditch network), within Cell 2 (small seasonally transient pool) as part of the Biodiversity Enhancement Area and the Lum (moderate sized pool) will provide key foraging areas for dabbling ducks, as well as egret and heron.

8.2.31 Table 8-2 below is provides a species by species assessment of all SPA species recorded across the entire Order Limits, as well as their distribution and preferred habitats and whether they have been considered as part of the NBBMA and (or) additive mitigation, whereby new measures are provided in addition to the existing FWF mitigation.

Table 8-2. Summary of species habitat requirements, distribution and additive mitigation measures for qualifying and assemblage species recorded during the field surveys

Species QS- Qualifying Species AS- Assemblage Species	Type of supporting habitat and distribution within the Order Limits	Preferred resources and habitat	Mitigation required?	NBBMA Additive Mitigation	Wider enhancement benefits
Golden plover (QS)	Almost exclusively concentrated within Cell 3 during the core non-breeding period (November-February, inclusive). Cells 2 and 5 also support irregular but exceedances of the 1% SPA threshold. No use of the Eastern SADA.	Short, open/low lying, damp grassland	Yes	Wet and dry grassland, scrapes, water-level control centred on Cell 3. Controlled recreational use of the area.	Conservation grazing, tree removal, hydrological management and dynamic management of the Order Limits for the lifetime of the Proposed Development
Black-tailed godwit (QS)	Almost exclusively in Cell 3; episodic moderate flocks in cell 2, 5 and 1, but not regular.	Shallow water, muddy margins	Yes	Expanded scrapes and controlled hydrology around Canal Pools. Controlled recreational use of the area.	Ditch improvements; reinstated pools, including enhancements to the Lum.
Pintail (QS)	Low, irregular use in Cell 3 and Lum	Shallow freshwater, wet grassland	No	Current habitats utilised will be retained and enhanced. Enhanced pool and scrape network will indirectly benefit this species.	Retention and enhancement of the Lum area and Biodiversity Enhancement area will be beneficial to this species.

					Note this species forages nocturnally
Teal (QS)	Exceedances of the 1% threshold at the Lum and Cell 3; negligible elsewhere	Scrapes, flooded grassland, ditches and ponds	No	Current habitats utilised will be retained and enhanced. Enhanced pool and scrape network will indirectly benefit this species	Retention and enhancement of the Lum area, Biodiversity Enhancement area and ditch networks will be beneficial to this species. Note this species forages nocturnally
Shoveler	Regular in Cell 3 during Year 3	Shallow pools	No	Current habitats utilised will be retained and enhanced. Enhanced pool and scrape network will indirectly benefit this species	Retention and enhancement of the Lum area, Biodiversity Enhancement area and ditch networks will be beneficial to this species.
Shelduck (QS)	Very limited utilisation across the Order Limits	Estuarine/brackish and minimal inland	No	Indirect availability of wet features delivered as part of the NBBMA	Wetland/ditch enhancement
Redshank (QS)	Very low numbers, only one 1% threshold exceedance within Cell 3.	Muddy edges, shallow water	No	Enhanced pool and scrape network will indirectly benefit this species	Retention and enhancements to the Lum.
Lapwing (AS)	Highest counts and regular threshold exceedances in Cell 3; presence noted in all areas of Order Limits, however, numbers were variable	Short damp grassland, open, shallow water	Yes	Wet grassland, scrapes, water-level control centred on Cell 3. Controlled recreational use of the area.	Conservation grazing, predator fencing and management for breeding conditions
Curlew (AS)	Recorded exclusively within the Western SADA. Regular winter use occurs across Cells 1, 2 and 3, with peak counts most frequently recorded in Cell 3. Cell 2 also supports notable peak counts, including exceedances of the 1% SPA threshold during some winters, reflecting opportunistic inland foraging associated	Coastal and estuarine thriving species. Inland requirements are damp grassland and soft soils	Yes	Wet and dry grassland mosaic provides improved inland foraging. Controlled recreational use of the area.	Grassland management and recreational management measures throughout the Order Limits.

	with wetter ground conditions.				
Wigeon (AS)	Restricted to Cell 3; occasional flocks	Shallow open water, short grass	No	Current habitats utilised will be retained and enhanced. Retention and enhancement of current scrapes and water features within Cell 3	Grassland management around waterbodies.
Gadwall (AS)	Low numbers, mainly recorded in Cell 3	Shallow water	No	Current habitats utilised will be retained and enhanced. Retention and enhancement of current scrapes and water features within Cell 3	Retention and enhancement of the Lum area, Biodiversity Enhancement area and ditch networks will be beneficial to this species.
Mallard (AS)	Widespread throughout the Order Limits, but peak counts in Cell 3	Generalist	No	Current habitats utilised will be retained and enhanced. Retention and enhancement of habitats will benefit this species indirectly	Retention and enhancement of the Lum area, Biodiversity Enhancement area and ditch networks will be beneficial to this species.
Tufted duck (AS)	Recorded only in Cell 3 Canal Pools (modest numbers).	Pools	No	Current habitats utilised will be retained and enhanced. Retention and enhancement of current scrapes and water features within Cell 3	Lum enhancements support occasional diving duck use.
Dunlin (QS)	Very rare and sporadic; always far below 1%.	Largely estuarine mudflats	No	Current habitats utilised will be retained and enhanced. Retention and enhancement of current scrapes and water features within Cell 3	N/A
Pink-footed goose and greylag goose (AS)	One isolated pink-footed goose record peak (131 in Year 3). Greylag very low; likely feral.	Short grassland, agricultural fields.	No	Grassland retained in Cell 2; NBBMA wet grassland provides	N/A

				occasional foraging but not essential. Controlled recreational use of the area.	
Whooper swan (AS)	Rare records of one bird (two occasions) across the three years of surveys	Wet grassland, shallow open water, flooded pastures; grazed lowland fields	No	Current habitats utilised will be retained and enhanced. Retention and enhancement of current scrapes and water features within Cell 3. Controlled recreational use of the area.	N/A
Ruff (AS)	Small single-figure flocks in Cell 3 only.	Small single-figure flocks in Cell 3 only.	No	Wet grassland, muddy margins, shallow scrapes; prefers open, soft wet soils for probing	N/A
Water rail (AS)	Only isolated individuals in Cell 3.	Dense, tall, wet vegetation such as reedbeds, rushes and marshy thickets; shallow water margins	No	Current habitats utilised will be retained and enhanced. Retention and enhancement of current scrapes and water features within Cell 3	Enhancements within the Biodiversity Enhancement Zone; enhanced pond and additional and enhanced reedbed as part of the design which will be of benefit to this species.
Mute swan (AS)	Occasional small counts, Cell 3 only.	Large, still or slow-flowing freshwater with aquatic vegetation; adjacent grazing areas	No	Current habitats utilised will be retained and enhanced. Retention and enhancement of current scrapes and water features within Cell 3	Likely to benefit from the Biodiversity Enhancement Zones, including the Lum (enhanced ponds and reeded areas).
Snipe (AS)	Widespread low numbers; occasional peaks in Cell 2 & Cell 3.	Wet grassland, soft soils, shallow scrapes.	No	Current habitats utilised will be retained and enhanced. Retention and enhancement of current scrapes and water features within Cell 3	Enhancements to the Lum including enhanced waterbody and grasslands.
Great-crested grebe	Very low or infrequent use; limited to deeper	Deep, open freshwater with submerged	No	Unlikely to benefit from proposed habitats.	N/A

	water bodies if and when present	vegetation; requires larger pools for diving and nesting			
Little egret	low-level presence; typical of the solitary nature	Shallow water, ditches and wetland area	No	Current habitats utilised will be retained and enhanced. Retention and enhancement of current scrapes and water features within Cell 3	N/A
All species will benefit from regular dynamic monitoring as part of the NBBMA and the enhancement areas within the Order Limits.					

8.2.32 As part of the NBBMA creation, the Canal Pools will be removed and subsequently partially reinstated to allow for the eradication and long-term management of New Zealand Pygmyweed (NZPW), pursuant to a New Zealand pygmyweed control and management strategy, which is required to be developed by a DCO Requirement. An appropriately experienced specialist contractor will determine the most effective eradication methods during the re-engineering works, including measures to manage any contamination risk.

8.2.33 Canal Pools located within the Mersey Estuary SSSI will be reinstated and managed within their existing footprint, specifically to restore that part of the SSSI to favourable condition to support high-tide roosting species (SSSI interest features), which is currently assessed as “Unfavourable - Recovering” as part of NEs 2020 condition assessment (SSSI unit 1011753), which is set out in the oNBBMS [**EN010153/DR/8.32**] **as updated during Examination]**. The reinstated pools will include sluices and/or a drain system to assist with active water-level control for conservation management, under the control of the appointed conservation organisation, enabling adaptive, seasonally responsive management of water levels to maximise suitability for overwintering and high-tide roosting bird assemblages that form the notified features of the SSSI. Canal Pools lying outside the SSSI will be permanently removed and replaced with grassland habitat that forms part of the overall mitigation strategy.

8.2.34 If untreated, NZPW presents a high risk of spreading to other waterbodies, including the Frodsham Wind Farm mitigation scrapes, Cell 6 (the main wetland bird area),

and the wider ditch network, representing a substantial ecological threat to birds and wildlife across Frodsham Marsh and to the integrity of designated sites reliant on network of interconnected wetland habitats.. While there is no statutory requirement for its removal, the Weeds Act 1959 and Wildlife and Countryside Act 1981 require landowners to prevent its spread. The Applicant does not currently control the Canal Pools and cannot implement treatment until land access is secured through approval of the DCO (discussed further in paragraph 8.3.23). As such the eradication and/or treatment of NZPW is a benefit of the Proposed Development and a necessary precursor to achieving favourable SSSI conditions and delivering functional supporting habitat for high tide roosting species.

8.2.35 The removal and reinstatement works within the Canal Pools area will facilitate delivery of a fully hydrologically connected, actively managed wetland system within the NBBMA, incorporating scrapes, wet grassland and controlled water-management features designed to support non-breeding waterbirds (including SPA species and the wider assemblage) throughout the year. These measures are expected to deliver measurable ecological enhancement and contribute to achieving favourable condition in line with Natural England guidance.

Conclusion Against Conservation Objectives and Adverse Effects on Integrity (AEoI) of the Mersey Estuary SPA and Ramsar (Habitat Loss; Loss of FLL): Construction and Operation

8.2.36 On the basis of the phased delivery of the NBBMA in advance of any loss of functional land, the availability of alternative habitats during construction, and the creation of a hydrologically controlled wetland system that provides habitat of demonstrably higher quality and reliability than the existing baseline, it is concluded that habitat loss arising from the Proposed Development will not undermine the conservation objectives of the Mersey Estuary SPA and Ramsar. The DCO-secured management of the Canal Pools within the SSSI ensures that high-tide roosting habitat and supporting habitat functions are restored and maintained, and will also act as an indirect benefit of Mersey Estuary SPA Site Improvement Plan (SIP). The NBBMA delivers sufficient extent, quality and seasonal availability of supporting habitat to ensure that the ecological functions relied upon by qualifying features are maintained.

8.2.37 Accordingly, with the NBBMA secured and functioning, the loss of FLL will not result in an Adverse Effect on Integrity (AEoI) of the Mersey Estuary SPA or Ramsar.

Overview of impact pathways

8.2.38 Construction of the Proposed Development has the potential to disturb or displace non-breeding waterbirds, including qualifying features of the Mersey Estuary SPA and Ramsar site, using FLL within the Order Limits. Disturbance pathways include direct effects (e.g. noise, human activity, machinery) and indirect effects (e.g. lighting, vibration, and visual intrusion).

Baseline evidence

8.2.39 Baseline data confirm that both the Eastern SADA and Western SADA (Cells 1and 5) and NBBMA (Cell 3 and part of Cell 2) are used by SPA species throughout the non-breeding season, particularly between October and March, with the NBBMA consistently supporting higher densities and species richness. Species recorded at thresholds of national or international importance include lapwing, golden plover, black-tailed godwit, teal, and curlew.

Sequencing and Seasonal Avoidance

8.2.40 The matters discussed in this section are included in the **Outline Construction Environmental Management Plan [EN010153/DR/7.5] as updated during Examination.**

8.2.41 To avoid and minimise cumulative disturbance impacts within the Order Limits, construction of the NBBMA (Cell 3 and Cell 2) will be completed and functional in advance of works within the SADA (both Eastern and Western SADA footprints). Construction of the NBBMA will be scheduled outside the sensitive period non-breeding bird season (i.e., construction between March and October inclusive only) to reduce impacts on this area of FLL and the SPA qualifying species and those part of the wider waterbird assemblage. The Eastern and Western SADA will remain available during the construction time.

8.2.42 Field survey data and BTO WeBS counts (for both FSL which partially overlaps cells 1, 2, 3 and 5 but extends outside of the Order Limits and Weston Marshes) indicate that April and September generally support low numbers of qualifying features within

the Order Limits, with the few 1% threshold exceedances during these months occurring almost exclusively within Cell 6 or areas outside the Order Limits.

8.2.43 On this evidence, March and October are treated as lower-sensitivity periods compared to the core non-breeding season (November to February). However, they are not considered entirely risk-free, and construction activities during these months will remain subject to ECoW oversight, real-time monitoring and adaptive management to ensure any unexpected concentrations of SPA species are appropriately managed (discussed in 8.2.43).

8.2.44 During the field surveys, few SPA qualifying species and those part of the wider bird assemblage were recorded during these months. Teal (24 during April- one occasion) and Curlew (46 during September, one occasion exceeding the 1% threshold), lapwing (4 during April- one occasion) and black-tailed godwit (1 record each year during the surveys, below1% threshold). Field survey data strongly corroborate the WeBS data for September and April, with only negligible numbers of SPA qualifying features recorded. However, the FSL WeBS data did show high counts of black-tailed godwit, but it is important to note that these records will have likely been associated with Cell 6 and beyond the Order Limits.

8.2.45 To inform the sequencing of construction and the identification of periods of lower sensitivity, a review of monthly WeBS data (2019–2024) for the relevant BTO sectors was undertaken. The table below (Table 8-3) summarises recorded exceedances of the 1% threshold for key SPA qualifying species during September and April within the Frodsham Sludge Lagoons (Western SADA) and Weston Marshes (Eastern SADA). This analysis supports the conclusion that these months typically hold substantially lower numbers of qualifying features within the Order Limits, while recognising that occasional exceedances primarily associated with Cell 6 or areas outside the Order Limits necessitate continued ECoW oversight and adaptive management during these periods.

Table 8-3. 1% threshold exceedances by species recorded during the passage period during the field surveys. These were then compared against the relevant BTO count sectors to evaluate whether such exceedances were typical.

Species and their monthly 1% threshold for the	BTO Sector	September -the number of times the 1% threshold exceedance occurred between 2019-2024	April- the number of times the 1% threshold exceedance occurred between 2019-2024

Mersey Estuary SPA			
Black-tailed godwit Sept: 51.38 Apr: 49.29	Frodsham Sludge Lagoons (Western SADA)	4	4
	Weston Marshes Eastern SADA)	0	0
Lapwing Sept: 12.48 Apr: 1.91	Frodsham Sludge Lagoons	4	3
	Weston Marshes	1	4
Curlew Sept: 19.15 Apr: 8.53	Frodsham Sludge Lagoons	0	2
	Weston Marshes	0	0

8.2.46 The overall construction will be staggered to ensure that areas of FLL remain available as long as practicable to support SPA species and the non-breeding waterbird assemblage during the highly sensitive core non-breeding period, which is further discussed in paragraph 8.2.40 onwards.

8.2.47 The Order Limits do not support breeding features of the SPA, and the Site is not designated for breeding bird interest, so works during this season balances ecological protection with construction delivery.

8.2.48 Works within both the Eastern and Western SADA will begin once the NBBMA is functional.

8.2.49 Work within the Western SADA , particularly the area directly adjacent to the NBBMA and Cell 2 in Cell 1, will be completed outside of the sensitive core non-breeding period where possible (Nov-Feb inclusive). The programming for construction works in these areas will be included within the detailed Construction Environmental Management Plan.

8.2.50 Construction within the Eastern SADA will take place throughout the non-breeding period based on the separation distance between the Eastern SADA and the NBBMA is at least 1km, which is well beyond published disturbance guidance (e.g.

NatureScot, 2022[55]), where disturbance distances for the qualifying species and waterbird assemblage range between 100m (mallard, gadwall) up to 650m (curlew). The proposed spatial and temporal mitigation falls within or exceeds these distances, providing a robust buffer and this is without considering the topography and natural screening within the Order Limits. The Western SADA will also remain available to SPA birds for this period.

8.2.51 The NBBMA will be fully functional prior to construction of the SADA, delivering 70.81 ha of managed wetland habitat capable of supporting displaced waterbirds. While construction in proximity to Cell 5 may introduce some risk of temporary disturbance to the NBBMA, this is reduced by a combination of mitigation measures. Topographical separation provides a natural barrier, with Cell 5 situated approximately 3–4 m higher than Cell 3 (see Figure 5). This means that most work on Cell 5 is 'set-back; from the edge of the Cell and will therefore not be visible to birds using the NBBMA. In addition, as set out below, works within a specified distance of the NBBMA will be subject to targeted noise mitigation. This combination of elevation, physical separation, and targeted noise mitigation will ensure that disturbance to qualifying features is effectively avoided during Western SADA construction.

Buffering of the Construction Zones

8.2.52 No disturbance is anticipated within the SPA/Ramsar boundary. The SADA is physically and visually separated from the Mersey Estuary by the Manchester Ship Canal and the Frodsham Score embankment, providing a minimum 250 m buffer to key estuarine habitats. SPA species will likely be habituated to some level of potentially disturbing activities, including boat traffic using the adjacent Manchester Ship Canal, and vehicles using the road which passes north of the NBBMA and runs parallel to the Manchester Ship Canal, as well as members of the public being present, using the Canal Pools for recreational fishing.

8.2.53 While Cell 6 comprises FLL and lies adjacent to the Order Limits, disturbance from construction is not considered likely to occur. This is due to significant topographic

[55] *Goodship, N.M. and Furness, R.W., 2022. Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species. NatureScot Research Report 1283. Available at: NatureScot [Accessed 9 May 2025].*

and vegetative screening: Cell 6 sits 6–10 m below the development platform and is visually separated and screened by steep embankments and dense scrub vegetation. There are subsequently no direct sight-lines or acoustic pathways between construction areas and habitats within Cell 6.

Noise and Vibration

8.2.54 The matters discussed in this section are included in the **Outline Construction Environmental Management Plan [EN010153/DR/7.5] as updated during Examination.**

8.2.55 Noise prediction calculations for the noise-sensitive ecological receptors (NSERs) identified that, in the absence of mitigation, predicted noise levels (LAeq) from earthworks within the NBBMA (Cell 3) and from general construction activities within the Solar Array Development Area (SADA) are likely to exceed established thresholds. Note that all other construction activities such as Continuous Flight Auger (CFA) piling, predicts construction-phase sound levels will remain below disturbance thresholds at the assessed ecological sensitive receptor locations.

8.2.56 Noise from construction traffic is considered in **ES Vol 2 Appendix 4-1: Noise Impact Assessment [EN010153/DR/6.2]** and is also considered in an additional document **Noise Technical Note in response to Natural England's (NE) Relevant Representations RR-012** in Appendix 2 which was provided to NE as part of on-going discussions with them**.** Construction traffic is presented as the worst-case scenario, as major replacement campaigns during the operational period will invole substantially less traffic and over a shorter period of time. Construction traffic will inevitably increase along the road between Cells 3 and 6 during the construction phase; however, due to the visual screening and elevated location of Cell 6, the disturbance would be considered very limited and negligible. Based on the **Noise Impact Assessment** [**EN010153/DR/6.2**], construction traffic is expected to increase by 0.9dB , which is well below the 3 dB where mitigation should be considered on the basis that this increase can influence a behavioural response. Visual and topographic screening around Cells, particularly Cell 3, 5 and 6 further limits disturbance potential.

8.2.57 Noise modelling provided in **ES Vol 2 Appendix 4-1: Noise Impact Assessment [EN010153/DR/6.2]** indicates that additional mitigation measures may be required in the following scenarios to avoid adverse effects on qualifying species where noise modelling indicates that temporary exceedance of the LAeq + 3dB and (or) Lamax thresholds may occur:

i) During NBBMA works in Cell 3 where activities occur within 80 m of the eastern boundary on weekdays, or within 110 m on Saturdays;
ii) Site preparation, PV installation, or general construction activities within 180 m of Cell 3's eastern boundary i.e. Cells 1 and 5, during the core non-breeding bird period; and
iii) Saturday morning works within 120 m of the SSSI north of Cells 2 and 3 during the core non-breeding bird period.

8.2.58 Without controls, these situations could lead to potential increased bird responsiveness to noise close to wetland features, during non-breeding periods, or where impulsive noise events occur.

8.2.59 The mitigation measures will include the use of acoustic screening such as hoarding, hay bales, or equivalent barriers capable of achieving of 5–10 dB attenuation; this would achieve a result in the Proposed Development leading to no changes in dB compared to the current ambient noise levels recorded within the areas identified for the need of additional mitigation listed above.

8.2.60 In addition, an Ecological Clerk of Works (ECoW) will oversee the implementation of works, including undertaking behavioural monitoring and bird counts. These data will be used to assess whether qualifying species are present in numbers exceeding 1% of the relevant population thresholds and to inform whether construction activities need modifying, whether they should proceed or be suspended, in accordance with an agreed protocol as part of the **oCEMP [EN010153/DR/7.5] as updated during Examination**.

8.2.61 The construction programme will be sequenced so that all higher-noise activities within the Western SADA (Cells 1 and 5) are undertaken outside the identified sensitive core non-breeding bird period (November–February) and only once the NBBMA is fully established and functioning. Should any construction activities within

the Western SADA unavoidably fall within the November–February period, an Ecological Clerk of Works (ECoW) will be required to assess all works occurring within the relevant noise-sensitivity distances identified above. This assessment will consider the presence and abundance of qualifying species, visibility of works, prevailing weather conditions, and proximity to wet features, reflecting Natural England's emphasis on context-dependent sensitivity. Where necessary, the ECoW will implement the agreed mitigation protocol, including screened working or temporary cessation of works. This is included in the **oCEMP [EN010153/DR/7.5]**.

8.2.62 This programming and sequencing of works does not apply to works within the Eastern SADA, as this area is spatially separated from the NBBMA and lies beyond the distances at which significant noise or visual disturbance effects could occur. As such, construction activities in the Eastern SADA will not give rise to disturbance of SPA qualifying features.[56]

8.2.63 No visual or noise disturbance is expected within Cell 6 (outside of the Order Limits) or adjacent off-site FLL due to topographic screening (e.g. scrub, embankments) and elevation differences of 6–10 m. Similarly, works near the River Weaver are separated from sensitive habitats by elevated land (e.g. Cell 1), limiting visual and acoustic pathways for disturbance.

UXO Risk

8.2.64 In addition to the construction activities in paragraph 8.2.55, potential presence of unexploded ordnance (UXO) across parts of the Site has been identified within ES: Volume 2 Appendix 10-1: Stage 1 Geo-Environmental Assessment [**EN010153/DR/6.2**]. Any UXO-related activities could occur as part of general construction processes, including earthworks and piling, and would not introduce additional construction plant, working hours or activity types beyond those already assessed for disturbance effects on SPA/Ramsar qualifying features and the waterbird assemblage.

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

8.2.65 UXO risk management measures are secured through the oCEMP and relate to construction health and safety procedures. These measures inform the manner in which intrusive earth works are undertaken (i.e. sequencing, duration and supervision; 8.2.67) thereby limited the likelihood of any unplanned disturbance. These measures inform the manner in which intrusive earth works are undertaken but do not alter the scale, duration or nature of construction activities assessed for disturbance effects on SPA/Ramsar qualifying features.

8.2.66 Furthermore, a UXO detonation would represent an unplanned and (or) accidental event. An UXO Management Plan will be prepared prior to construction commencing as part of, or to accompany the final CEMP, which will be designed to avoid the likelihood of an accidental detonation, through briefings, Intrusive Magnetometer Surveys and a UXO specialist overseeing the works at all times during the construction phase and ensure that any planned detonations take account of sensitive receptors.

8.2.67 A UXO detonation would be an isolated and non-reoccurring noise and vibration event and in the unlikely event of a detonation. There is no literature on direct UXO blast studies that are associated with U.K. estuarine birds, but empirical evidence[57] and foundational literature[58] indicates that impulsive noise can elicit a range of behavioural responses in waterbirds, including flight with temporary abandonment of the immediate area at higher noise levels. However, such responses are associated with intentional or repeated disturbance and do not represent permanent habitat abandonment or loss of site functionality. In the context of an isolated, unplanned UXO detonation, any displacement would be transient, spatially limited and would not result in sustained avoidance of habitats supporting the conservation objectives of the site.

8.2.68 Furthermore, it is reasonable to assume qualifying species (not limited to) would not be present in the immediate vicinity due to the presence of plant and personnel which

[57] *Wright, Mark & Goodman, Paul & Cameron, Tom. (2010). Exploring behavioural responses of shorebirds to impulsive noise. Wildfowl. 60. 150-167.*
[58] *Drewitt, A., Hawthorne, E., Saunders, R. & Anthony, S. (2018) A Review of the Effects of Noise on Birds. Version 1. Natural England, October 2018.*

would already be in the area for a detonation to occur.[59] In the unlikely event, there is no plausible pathway, by which such an event could result in prolonged and sustained habitat loss, prolonged displacement, population levels or changes to the availability or functionality of the habitats which already exist. Such an event would be transient similar to other impulsive noise events including firework events, a low-lying jet and shooting days that occur locally; albeit these events are typically longer in duration. As with most disturbance events, birds have the ability and tolerance to return to previous behavioural states or activities once impacts have ceased. Such an event would do not give rise to sustained disturbance pressure and would not undermine the conservation objectives of the Mersey SPA and Ramsar Site.

Lighting

8.2.69 Construction works would take place 08.00 to 18.00 hrs Monday to Friday and 08:00 to 13:00 hrs Saturday. The compounds would be lit during periods of low light during construction working hours. Outside working hours, lighting would only be switched on for security breaches or temporary mobile task lighting.

8.2.70 A sensitive lighting strategy would be put in place to manage temporary lighting used during the construction phase, pursuant to the **oCEMP [EN010153/DR/7.5 as updated during Examination].**Any lighting that is required would be directed away from the NBBMA and FLL (Cells 1 and 5). This would be achieved by the use of low-level lighting and lighting hoods to prevent the spillage of light from its intended source. Any lighting would also be directed away from the ditches, watercourses and ponds, and associated terrestrial habitats.

8.2.71 This will be applied across the entirety of the Order Limits where appropriate.

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

Conclusion Against Conservation Objectives and Adverse Effects on Integrity (AEoI) of the Mersey Estuary SPA and Ramsar- Disturbance and Displacement of Qualifying features and waterbird assemblage – construction phase

8.2.72 Conservation objectives for the Mersey Estuary SPA require that disturbance including noise, vibration, light, and visual intrusion does not significantly affect the behaviour or distribution of qualifying species (Natural England, 2014[60]). AEWA (2016[61]) defines significant disturbance as any activity likely to cause sustained changes in local abundance or distribution, or reductions in survival, breeding, or foraging success.

8.2.73 Taking into account the embedded design, phasing of construction, seasonal timing, topographical screening, acoustic mitigation, and ECoW oversight and the consideration of potential UXO risks as part of construction activities, it can be concluded beyond reasonable scientific doubt that the construction of the Proposed Development will not result in a significant disturbance of SPA/Ramsar qualifying species and will not result in AEoI.

8.3 Disturbance and Displacement of Qualifying features and waterbird assemblage – operational and decommissioning phases

8.3.1 The operational phase of the Proposed Development will introduce a long-term change in land use within the SADA, transitioning from agricultural or semi-natural grassland to a managed solar energy landscape creating long-term displacement of species which utilised Cells 1 and 5 (and occasionally the wider SADA).

8.3.2 Ongoing, low-level disturbance are likely to include:

i) intermittent human presence for inspection, replacement and maintenance activities,
ii) the visual presence of solar panels, through occasional reflections from photovoltaic (PV) modules.

[60] *Natural England. 2014. Site Improvement Plan Mersey Estuary (SIP 138): Natural England.*
[61] *The Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA). 2016. Resolution 6.7 - Adoption of guidance in the context of implementation of the AEWA action plan.*

8.3.3 These factors may influence the behaviour of qualifying waterbirds using adjacent FLL, including the NBBMA.

Component Replacement and Pollution Risk

8.3.4 Component replacement activities over the operational lifetime are expected to be infrequent, and short in duration. Nonetheless, these works could generate temporary noise, vibration, dust, or localised risk of pollution (e.g. from fuel, oils, or waste materials). The greatest sensitivity is likely at the eastern edge of the NBBMA where the area fringes the SADA.

8.3.5 These activities are anticipated to be of similar, or lower, magnitude to those experienced during the construction phase.

8.3.6 Such activities will be managed through embedded mitigation set out in the **oOEMP** [**EN010153/DR/7.6 as updated during Examination]** and **oDEMP** [**EN010153/DR/7.7 as updated during Examination]**, including:

i) a sensitive lighting strategy that avoids illumination of sensitive wild bird and supporting habitats (no permanent lighting is proposed within the SADA);
ii) restriction of access routes to established tracks and compounds to minimise supporting habitat encroachment;
iii) habitat screening along site boundaries to minimise visual and noise intrusion;
iv) habitat management prescriptions secured via the Outline Operational Environmental Management Plan (oOEMP) [**EN010153/DR/7.6 as updated during Examination]**;
v) standard pollution prevention controls (e.g. spill kits, bunded storage); andseasonal working where component replacement and (or) disturbance similar to that described in the construction phase is anticipated.

Noise Impact Assessment in relation to Operational Activities

8.3.7 Operational noise from the site was assessed using ISO 9613-2 noise prediction modelling, implemented through Computer Aided Noise Abatement (CadnaA) software to produce a noise map representing the highest likely noise levels during peak operational activity at noise sensitive ecological receptor (NSER) locations. Predicted noise levels at the NSERs during the operational phase ranged between

43dB and 48dB $L_{Aeq,1hr}$, during the daytime. During night-time periods this is predicted to be between 34dB and 48dB $L_{Aeq,15mins}$ and an LAmax of 43dB to 57dB. The results of noise predictions which are within the typical ambient noise level averages[62].

8.3.8 The operation of the plant equipment is not expected to generate significant impulse noise, as this is not characteristic of the plant type. Once operational, the equipment will produce a relatively steady and continuous noise source, which is generally considered to be less disturbing to birds than irregular or impulsive noise events.

8.3.9 Ambient noise levels in and around the Site, including ecologically sensitive areas, are already elevated due to the proximity of the M56 Motorway. Considering the existing acoustic environment, the predicted noise levels, and the continuous nature of the plant operation, the impact of the Proposed Development on NSERs is assessed as negligible as presented in **ES Volume 1 Appendix 4-1** and detailed in paragraph 8.4.7 onwards.

8.3.10 It should also be noted that construction noise is likely to be more impactful than operational noise (including any replacement campaign); however, even construction-phase effects are assessed as negligible

Recreational Pressure and Access Management

8.3.11 Public access and recreation in and around the Order Limits will continue during operation, with some increased use of permissive paths and informal routes for walking and dog walking. Potential disturbance pathways include:

i) visual and acoustic disturbance from walkers, cyclists and vehicles (operational vehicle movements considered negligible based on the findings of the Noise Impact Assessment (ES Volume 1 Appendix 4-1);
ii) Controlled dogs, especially in proximity to wetland habitats (e.g. NBBMA and Cells 1 boundary); and
iii) Concentration of access in sensitive edge habitats.

[62] *A review of the effects of noise on Birds' Version 1 published in 2018 by Natural England (Allan Drewitt, Emma Hawthorne, Richard Saunders & Sarah Anthony)*

8.3.12 To manage and mitigate recreational pressure, the following design and access control measures have been incorporated into the project:

iv) screening and planting at key locations (see the **oLEMP [EN010153/DR/8.32] as updated during Examination** to block visual disturbance,
v) realignment of new permissive paths behind existing or enhanced topographic screening features wherever feasible,
vi) signage to encourage responsible dog-walking behaviour (e.g. leads in sensitive zones);
vii) avoiding cycling and horse-riding on paths closest to the NBBMA and Cell 1/River Weaver boundary; and
viii) provision of a dedicated birdwatching/viewing area overlooking Cell 3, with screens and/or a bird hide to focus recreational use in one location while shielding sensitive habitats.

8.3.13 Vehicle access for operational activities will be limited and infrequent. With the main access into the Site confined to current established routes. Given the predictability of these movements and their distance from wetland features, they do not constitute a meaningful disturbance pathway for SPA species. In addition, the cessation of existing agricultural operations including tractor movements, machinery use, crop management and livestock activity will remove a current source of regular disturbance within the SADA, resulting in a net reduction in baseline disturbance pressure across the operational landscape.

8.3.14 Management of recreational pressure on the NBBMA will be overseen by the appointed nature conservation organisation, whom will undertake regular bird counts and behavioural monitoring to identify any disturbance responses associated with public access. This will follow on from the fact that the initial design of the new access provision while will be approved by CWaCC pursuant to DCO Requirement. Where monitoring indicates localised pressure or emerging risks to SPA species, access controls and screening measures will be adjusted dynamically. For instance, by amending signage, temporarily redirecting paths, or increasing buffer zones. This adaptive, evidence-based approach ensures that recreational use remains compatible with the conservation objectives of the Mersey Estuary SPA throughout the operational lifetime of the Proposed Development. This requirement is included

in the oOEMP. As a result of the management of recreational pressure, species are likely to thrive compared to the current baseline of the area, will be reduced and managed. There is currently no recreational access management, which can cause disturbance, e.g., from dog-walking or uncontrolled fishing.

8.3.15 Mitigation including screening and route restrictions secured through the oOEMP [**APP-137 – 7.6 Outline Operational Environmental Management Plan as updated during Examination**] will be used to control potential effects from human and vehicle presence during operation. Operational disturbance has therefore been assessed on the basis of both human and vehicle activity, and the low-frequency, highly controlled nature of maintenance traffic means that such effects are not predicted to be significant. It is also important to note that the Proposed Development itself, including the solar panel arrays and associated infrastructure will introduce additional physical screening (acoustic and visual), which will be supplemented by the enhanced vegetation screening proposed in the oLEMP. As a result, the only areas where increased operational disturbance may realistically occur, with potential implications for the SPA/NBBMA, are within Cell 2 and the eastern extent of Cell 5.

Conclusion Against Conservation Objectives and AEoI - Disturbance and Displacement of Qualifying features and waterbird assemblage – operational and decommissioning phases

8.3.16 Taking account of the predicted operational noise levels, the continuous and non-impulsive nature of plant noise, the current high existing ambient noise environment, and the suite of access-management and screening measures secured through the oOEMP **[EN010153/DR/7.6]** and oLEMP **[EN010153/DR/7.13] as updated during Examination**, operational disturbance from the Proposed Development is not anticipated to give rise to behaviourally meaningful effects on qualifying features of the Mersey Estuary SPA or Ramsar site.

8.3.17 Operational and recreational pressure will be secured and controlled through designed path alignments, screening, signage and active management, ensuring that access remains compatible with conservation objectives. The removal of existing agricultural disturbance will further reduce baseline disturbance relative to current conditions.

8.3.18 With adaptive management, limited and predictable vehicle movements, and the absence of significant disturbance pathways during decommissioning, no adverse effects on site integrity is predicted, in relation to disturbance or displacement of SPA qualifying species or the wider waterbird assemblage.

8.3.19 In light of the above, disturbance and displacement will not result in Adverse Effects of on Integrity (AEoI) of the Mersey Estuary SPA and Ramsar.

Changes in Water Quality, INNS and Ground Conditions

Compliance with the Water Framework Directive (All Phases)

8.3.20 The Proposed Development has been screened in for potential effects on water quality under the **Water Framework Directive (WFD) ES Vol 2 Appendix 9-2: Water Framework Directive Assessment [EN010153/DR/6.2].** It lies within the Northwest River Basin District, where environmental objectives include:

i) preventing deterioration of water body status;
ii) achieving standards for protected areas; and
iii) progressively reducing pollution.

8.3.21 Across all phases (construction, operation and decommissioning), the measures incorporated into the design and mitigation of the Proposed Development through the **oCEMP [EN010153/DR/7.5], oOEMP [EN010153/DR/7.6]** and **oDEMP [EN010153/DR/7.7] as updated during Examination** will contribute positively to all relevant WFD objectives throughout the construction, operational and decommissioning phases of the development. These measures include pollution prevention, drainage controls, and sensitive habitat management.

Land Use Change and INNS Control – operational phase only

8.3.22 During the operational phase, the change in land use from arable agriculture to solar development will eliminate the application of pesticides and fertilisers, reducing diffuse nutrient loading and potential chemical inputs to surface and groundwater. This aligns with NE's targets for maintaining or improving water quality to support non-breeding bird assemblages.

8.3.23 An Invasive Non-Native Species (INNS) plan will be produced as part of the full CEMP as outlined within the **oCEMP [EN010153/DR/7.5] as updated during Examination**. Presence of NZPW has been identified within parts of the NBBMA, including those located within the SSSI which are detailed and presented in **(**the oNBBMS). A targeted NZPW control and management strategy will be implemented for the Proposed Development, as secured via DCO Requirement. The strategy would include measures for eradication and long-term control of this invasive species, which will significantly improve habitat quality in wetland habitat and water quality and will contribute to the delivery of favourable conditions for the SSSI as well as SPA/Ramsar qualifying bird species.

Ground disturbance and Groundwater risk – construction and operational phase

8.3.24 As outlined in the ES Chapter 10 (Ground Conditions), there is some potential for temporary effects on surface water and groundwater quality during construction of the NBBMA, primarily due to shallow excavation of previously deposited dredged materials. These activities may slightly increase the leachability of contaminants in soils or perched groundwater. However, the excavations will be shallow (circa 1 m) and are to be located above the water table and therefore pose a low risk to controlled waters.

8.3.25 Hydrological connections between the Proposed Development and the surrounding FLL have been assessed, specifically with regards to the works proposed within the NBBMA (cell 3), whereby ditches within this area drain west and discharge into the Manchester Ship Canal and the surrounding areas, the eastern SADA drain, in to EA main rivers (the river Weaver). The Western SADA (Cell 1and Cell 5), which is elevated, drains into the NBBMA and subsequently into the Manchester ship canal. Chapter 9: flood risk and surface water and Water Framework Directive assessment (ES Vol 2, Appendix 9-2) confirm that there will be no change in hydrology, flood risk or soil saturation beyond the Proposed Development with mitigation measures in place during both construction and operational phases. On this basis, there is no mechanism by which construction or operation of the NBBMA could materially alter hydrological conditions within surrounding FLL.

8.3.26 To manage the risk, the following measures will be implemented:

i) A Method Statement and Monitoring Plan will be prepared for all excavation works within the NBBMA;
ii) A watching brief by a qualified ecologist or ornithologist will be undertaken during wetland creation, to ensure ecological sensitivity is maintained;
iii) Water quality monitoring will be carried out in nearby surface watercourses; Invertebrate surveys will be undertaken both during and following construction to assess ecological responses;
iv) A Materials Management Plan (MMP) and/or Deposit for Recovery (DfR) permit will be developed and agreed with the Environment Agency prior to works, supported by a site-specific groundwater risk assessment, and where necessary; and
v) a Remediation Strategy or treatment protocol for soils (if applicable).

Decommissioning phase considerations

8.3.27 Although the decommissioning phase is not expected for several decades, it has been appropriately considered in the **Outline Decommissioning Environmental Management Plan [EN010153/DR/7.7] as updated during Examination.** The cessation of site activities and removal of solar infrastructure will be undertaken with measures in place to prevent pollution and manage surface water appropriately.

8.3.28 A dedicated Decommissioning Surface Water Management Plan (DSWMP) will be prepared and implemented to control run-off, sedimentation, and pollution risks during this phase. In addition, a Pollution Prevention Plan will be developed to ensure that decommissioning activities do not result in contamination of watercourses or groundwater.

8.3.29 The Proposed Development has been designed to manage flood risk throughout its full lifecycle, including decommissioning, as detailed in the **Flood Risk Assessment and Drainage Strategy (ES Appendix 9-1) [EN010153/DR/6.2] as updated during Examination.**

8.3.30 In conclusion, the Proposed Development will not compromise WFD objectives or SPA conservation targets. On the contrary, the reduction in agricultural runoff, active wetland management in the NBBMA, and removal of invasive species are expected

to contribute to improved local water quality and ecological function, supporting the long-term condition of supporting habitats for non-breeding SPA species.

Conclusion Against Conservation Objectives and Adverse Effects on Integrity (AEoI) of the Mersey Estuary SPA and Ramsar – Water Quality, Ground Conditions and INNS

8.3.31 With the implementation of the secured construction, operational and decommissioning controls, including pollution-prevention measures, drainage management, targeted INNS treatment, and monitoring commitments, the Proposed Development will not give rise to water-quality or ground-condition changes capable of undermining the conservation objectives of the Mersey Estuary SPA or Ramsar site. The reduction in agricultural inputs, eradication of NZPW, and establishment of managed wetland habitats within the NBBMA are expected to improve local hydrological function, SSSI favourability and water quality relative to the baseline.

8.3.32 In light of the above, no AEoI of the Mersey Estuary SPA is concluded.

8.4 Air Quality (All Phases)

Baseline air quality and Sensitivity of designated sites

8.4.1 The Proposed Development is located within the administrative area of Cheshire West and Chester Council, where long-term monitoring confirms that concentrations of PM_{10}, $PM_{2.5}$, and NO_2 are consistently below national air quality objectives. Modelling of predicted background levels for the Order Limits and surrounding 1 km grid squares demonstrates that concentrations are low and expected to decline further between 2025 and 2029. There are no Air Quality Management Areas (AQMAs) in proximity to the Site, and prevailing wind conditions promote the dispersion of airborne emissions away from sensitive ecological receptors.

8.4.2 The Mersey Estuary SPA and Ramsar site, underpinned by the Mersey Estuary Site of Special Scientific Interest (SSSI), supports extensive areas of saltmarsh and intertidal mudflat. These estuarine habitats are critical to the site's qualifying features and waterbird assemblage and are protected to maintain their extent, distribution, structure, and function in support of foraging, roosting, moulting, and loafing behaviours. These sensitive estuarine habitats do not occur within the Order Limits.

8.4.3 A further mitigating factor is the spatial separation between the Proposed Development and the SPA/Ramsar site. The Manchester Ship Canal, which lies between the Order Limits and the estuarine edge of the Mersey Estuary, is not Functionally Linked Land and serves as a hard boundary. On the estuary side of the canal lies Frodsham Score, a raised embankment that provides visual and physical screening. This establishes a functional buffer of approximately 250 metres between potential emission sources and the nearest designated estuarine habitat. This distance far exceeds IAQM's 50 m risk zone.

FLL Habitat sensitivity

8.4.4 The land within the Eastern and Western SADA (Cells 1 and 5) and the NBBMA has been identified as FLL or to have the potential to be FLL, used by qualifying waterbird species associated with the SPA/Ramsar site. This land comprises primarily improved grassland and ephemeral pools and supports birds at high tide when intertidal foraging grounds are submerged.

8.4.5 The construction dust assessment **(ES Vol 2 Appendix 4-2: Construction Dust Assessment [EN010153/DR/6.2])** concludes that a high risk of ecological impact from dust deposition during construction has been identified on a precautionary basis, due to the presence of FLL within the Eastern and Western SADA (Cells 1 and 5) and NBBMA which supports features of the Mersey Estuary SPA and Ramsar site. However, the habitats within the SADA and NBBMA primarily improved grassland and ephemeral pools are not inherently sensitive to dust deposition, and the qualifying wetland bird features are not dependent on vegetation quality. As such, the functional value of the FFL is unlikely to be compromised.

8.4.6 Significant effects are unlikely, subject to implementation of standard best practice measures. These are secured within the **oCEMP [EN010153/DR/7.5],** oOEMP **[EN010153/DR/7.6]** and **oDEMP [EN010153/DR/7.7] as updated during Examination**.

Conclusion against Conservation Objectives and AEoI- Air Quality

8.4.7 With the implementation of standard best-practice dust controls secured through the **oCEMP [EN010153/DR/7.5], oOEMP [EN010153/DR/7.6]** and **oDEMP [EN010153/DR/7.7]**., and taking account of the low baseline pollutant

concentrations, the spatial separation from designated estuarine habitats, and the limited sensitivity of FLL to airborne deposition, the Proposed Development is not predicted to give rise to air-quality changes capable of undermining the conservation objectives of the Mersey Estuary SPA or Ramsar site.

8.4.8 Considering the above, no AEoI is anticipated of the Mersey Estuary SPA and Ramsar site.

8.5 Glint and Glare- operational

8.5.1 Glint and glare modelling has been undertaken to assess potential reflective impacts from the Proposed Development detailed in **ES Vol 2 Appendix 4-3: Glint and Glare Assessment [EN010153/DR/6.2]**. The assessment confirmed that, prior to mitigation, limited solar reflections were predicted along three short sections of the M56 (approximately 1.1 km in total) and at dwellings associated with 39 receptors in Frodsham.

8.5.2 Embedded mitigation measures include adjustments to panel orientation and the provision of 3.5 m high vegetative screening. These design elements reduce residual reflections to negligible levels. As screening matures, perceptual impacts will decline further. Any remaining reflections are predicted to occur during low sun angles, when direct sunlight would already be present in the field of view, thereby limiting any additional visual impact.

8.5.3 No glint or glare effects coincide spatially with areas used regularly by SPA bird species foraging ranges, either within the designated site or on FLL based on SPA flightpaths and the Vantage Point survey data **[ES Vol 2 Appendix 8-1: Ornithology Survey Report [EN010153/DR/6.2]** where no obvious patterns emerged from species which flew over and (or) came in to land within the Order Limits. [63]

8.5.4 The potential for visual disturbance to SPA/Ramsar qualifying species has been assessed with reference to typical bird flight behaviour and the characteristics of the designated site. Waterbirds associated with the SPA/Ramsar generally move across the flat estuarine landscape in broad, dispersed flight paths, meaning their exposure

[63] *Natural England (2024) Seabird Mapping & Sensitivity Tool (SeaMaST). Available at: data.gov.uk (Accessed: 2 May 2025).*

to visual elements, including solar panel reflections or structural outlines is brief and intermittent. The open topography further reduces the potential for sustained visual impact. Additionally, perimeter planting (Including narrow wildflower grassland planting) around the solar panels will help integrate the development into the landscape and may reduce the likelihood of attracting waterbirds into the SADA area. Overall, the potential for visual disturbance or displacement is very low.

8.5.5 The panels themselves will have non-reflective coating, are low-profile and non-intrusive relative to existing landscape elements such as hedgerows, scrub, and trees. At typical heights below 4 m, the arrays do not obstruct flight paths or present a novel visual barrier. There is no evidence to suggest that panels of this height and configuration would trigger avoidance responses in estuarine waterbirds.

8.5.6 While the Glint and Glare Assessment did not directly consider effects on birds, ecological evidence on flight behaviour, combined with the Order Limits design, topography, and embedded mitigation, indicates that the risk of glint/glare-related disturbance to SPA species is negligible.

8.5.7 There is very limited research of this effect in the UK, with the main studies associated with very large solar farms in desert regions, which are not comparable with the UK. It is noted that a NE 2016 report (NEER 012[64]) 'Evidence review of the impact of solar farms on birds, bats and general ecology' makes no reference to evidence of glint and glare. To the Applicant's knowledge, there are no known cases of waterbirds colliding with solar panels. As such the risk of such an occurrence is extremely low.

Conclusion against Conservation Objectives and AEoI- Glint and Glare

8.5.8 Given the embedded mitigation, low reflectivity of panels, absence of overlap between predicted reflection zones and areas regularly used by SPA qualifying species, and the behavioural ecology of estuarine waterbirds, the potential for visual disturbance or displacement arising from glint and glare is assessed as negligible. No mechanism has been identified by which residual reflections could alter the

[64] *Natural England (2017) Evidence review of the impact of solar farms on birds, bats and general ecology (NEER012) 1st edition - 9th March 2017.*

distribution, behaviour, or supporting habitat use of qualifying species within the Mersey Estuary SPA or its Functionally Linked Land.

8.5.9 Accordingly, no AEoI is anticipated on the Mersey Estuary SPA and Ramsar site.

8.6 In-Combination Effects

8.6.1 In accordance with Regulation 63 of the Conservation of Habitats and Species Regulations 2017 (as amended), this section considers whether the Proposed Development, in combination with other relevant plans and projects, may result in adverse effects on the integrity of the Mersey Estuary SPA and Ramsar site. Particular attention is given to pathways such as habitat loss, disturbance, and degradation of FLL used by non-breeding SPA qualifying features.

8.6.2 FWF is an operational scheme and is therefore treated as part of the baseline rather than as a cumulative project. Nevertheless, in response to Natural England's advice, the interaction between the FWF mitigation and the Proposed Development's NBBMA is described in paragraph 8.2.11 and 8.2.25. This confirms that the NBBMA has been designed having regard to the existing FWF mitigation and provides additive, increased capacity for SPA qualifying species, such that no additional in-combination adverse effect on site integrity arises. However, the decommissioning/repowering phase of the windfarm has been included as part of the review of activities which could act in-combination with the Proposed Development during the operational phase.

8.6.3 A review of relevant development allocations, planning applications, and nationally significant infrastructure projects (NSIPs) has been undertaken to identify plans or projects that could plausibly act in combination with the Proposed Development. This includes major projects located within the Protos development area and surrounding landscape.

8.6.4 The approach to the Cumulative Effects Assessment is described in **ES Volume 1 Chapter 4.0 [EN010153/DR/6.1]**. A short list of projects which the Proposed Development could have potential significant cumulative environmental effects with has been prepared, see **ES Volume 2 Appendix 4-2 [EN010153/DR/6.2]**. The location of the projects is shown on **ES Volume 3 Figure 4-3 [EN010153/DR/6.3]**.

8.6.5 A number of schemes within the Protos development site close to the Order limits benefit from planning permission and are being brought forward either concurrently or in overlapping timeframes. Owing to the proximity of these schemes to one another, they have been collectively considered. Individual projects with greater spatial or ecological relevance to the Proposed Development are addressed separately.

8.6.6 For the purpose of this HRA, only those plans and projects in the short list with a realistic potential to act in combination in a way that could affect the conservation objectives of the Mersey Estuary SPA/Ramsar site have been considered.

8.6.7 Through ongoing consultation and discussion throughout the Examination period, the Hobb Lane Solar Farm development has recently been identified as relevant to the in-combination assessment and has therefore been included where there is potential to affect the conservation objectives of the Mersey Estuary SPA and Ramsar site.

Frodsham Windfarm (Decommissioning or Repowering)

8.6.8 In relation to any potential temporal overlap between the decommissioning or repowering of the FWF and replacement activities associated with the Proposed Development, it is noted that any such overlap would be limited in scale and duration. Replacement activities would generate traffic movements that are materially lower than those associated with the construction phase.

8.6.9 The management of any crossover between these activities is addressed within Section 2.4 of the oOEMP [**EN010153/DR/7.6 as updated during Examination]**. Specifically, paragraph 2.4.12 provides that, where an overlap is identified, the notification that CWaCC approves before major replacement activities take place must account for that overlapApproval would only be granted where the authority is satisfied that appropriate management and control measures are in place to avoid adverse effects such as, but not limited to, phasing and sequencing or seasonal limitations. It is also noted that CWaCC will be able to consider in combination impacts in deciding whether or not to approve FWF's decommissioning plan or any planning application for re-powering.

8.6.10 Accordingly, the potential for in-combination effects arising from concurrent FWF decommissioning or re-powering and replacement activities is considered to be effectively controlled and therefore, in-combination effects are not predicted.

Halton Schemes – Ref 16 (100MW BESS) and Ref 17 (135Kv substation)

8.6.11 These developments are located to the north of the Weaver Navigation (2.5 km from the NBBMA) on land which is unlikely to be used by the species associated with the Mersey Estuary SPA, Ramsar and SSSI. Potential cumulative impacts related to air and water quality can also be ruled out due to the distance (above the thresholds) of the two developments.

8.6.12 The habitats present on the development are relatively common (of local value) and of low quality (i.e. not sensitive to temporary air quality changes). The area is also not considered to support SPA/Ramsar species. The nature of the development proposed (BESS) means the level of impact on ornithology is likely to be limited.

8.6.13 As such significant cumulative effects are not predicted.

Protos Schemes – Ref 20 (Ince Biopower CO2); Ref 27 (Plastics Recycling Facility); Ref 25 & 28 (Hydrogen Production Facility); Ref 31 (Waste Recycling and hydrogen refuelling); 34 (Standby Electricity Generating Plant); Ref 35 (Post Combustion CO2 Capture Facility); Ref 81 (Protos West AGI)

8.6.14 The likelihood of significant cumulative effects occurring with the developments at Protos are limited due to the separation distance between these projects and the Order Limits. Furthermore, all the Protos development were subject to HRA screening and deemed to not have any effects on the integrity of the Mersey Estuary SPA.

8.6.15 In order to mitigate effects of the Protos development a large scale strategic ecological mitigation strategy has been developed and was implemented in advance of development on Protos. This has been in place for a number of years and is delivering ecological benefit, even in advance of many of the development plots being used. On this basis no significant cumulative effects are predicted.

8.6.16 Due to the distance from the Proposed Development and the presence of mitigation, no adverse cumulative effects on SPA/Ramsar bird features are predicted. However,

the mitigation strategy for the Protos Schemes, in combination with the mitigation and enhancement measures for the Proposed Development, will potentially have a cumulative (beneficial) significant effect on ornithological populations.

Ref 33 (Encirc Automated Warehouse)

8.6.17 The likelihood of significant cumulative effects occurring with the developments at Enric are limited due to the separation distance between this project and the SADA and NBBMA (2.8 km).

8.6.18 Potential cumulative impacts related to air and water quality can be confidently ruled out due to the lack of impact pathway and the physical distance between the developments.

8.6.19 On this basis no significant cumulative effects are predicted.

Ref 38 (HyNet Hydrogen Pipeline)

8.6.20 The proposed HyNet Hydrogen Pipeline crosses the eastern section of the SADA and intersects the centre of the Skylark Mitigation Area. At its closest point, it lies approximately 0.5 km south of Cell 3, the NBBMA. Given this alignment, there is potential for cumulative effects on qualifying bird species of the Mersey Estuary SPA, Ramsar and SSSI.

8.6.21 The Habitats Regulations Assessment (HRA) prepared in support of the HyNet Hydrogen Pipeline identified the potential for likely significant effects (LSEs) on the Mersey Estuary SPA and Ramsar site during construction and decommissioning, particularly due to disturbance and risks associated with water and dust pollution. As such, a Stage 2 Appropriate Assessment was deemed necessary. Surveys conducted to inform the HRA recorded high numbers of SPA qualifying species, particularly in areas around Cell 6, which lies adjacent to both the Proposed Development and the pipeline corridor.

8.6.22 While potential LSEs related to water and air quality were identified, cumulative impacts from these pathways are considered unlikely due to the physical separation of the two schemes, the presence of sub-optimal habitats (not sensitive to dust), and the application of standard best-practice and embedded mitigation measures, which will be secured through each project's CEMPs.

8.6.23 Although the HyNet project is still at the pre-application stage, with submission date unknown but delayed from 2025, its construction phase could still overlap with that of the Proposed Development. However, during operation, the pipeline would be fully underground, and habitats would be reinstated post-construction, minimising long-term ecological impacts.

8.6.24 The pipeline runs approximately 0.5 km south of the Non-Breeding Bird Mitigation Area (NBBMA) at its closest point and does not intersect any known FLL. Although it lies within 500 metres of FLL, indirect impacts are expected to be limited due to the distance involved and the presence of natural screening between the pipeline works and sensitive areas.

8.6.25 In addition, the Hynet PEIR sets out that the pipeline works would proceed (at a rate of approximately 150–350 m per day), which would enable the pipeline within the Site to be laid in approximately one month, meaning effects would be short term and temporary. The PEIR also states that the construction phase would be undertaken between March and September, avoiding the peak sensitive period for non-breeding birds. The nature of disturbance during pipeline construction is expected to be similar to that of the Proposed Development. The HyNet PEIR includes a draft oCEMP, committing to a suite of management plans and best practice measures to safeguard wildlife during construction, similar to those set out in the **oCEMP [EN010153/DR/7.5]** for the Proposed Development (Frodsham Solar). These measures are anticipated to be secured via Development Consent Order (DCO) requirements. During the operational phase, the pipeline will remain underground, and previously affected habitats will be restored; therefore, no cumulative operational effects are anticipated. In accordance with the commitments set out in the oCEMP [**EN010153/DR/7.5**], the Applicant will use reasonable endeavours to co-ordinate construction programming and environmental mitigation with Cadent Gas and Eni should the construction of one or both HyNet projects overlap with the Proposed Development. This includes establishing a joint working group, consulting on detailed design and programming, and ensuring that agreed phasing and mitigation measures are incorporated into the respective CEMPs for approval by CWaCC. This mechanism provides the necessary control to avoid significant cumulative or in-combination effects on the Mersey Estuary SPA/Ramsar site.

Ref 37 (HyNet Carbon Dioxide Pipeline)

8.6.26 The closest point of this project is approximately 3 km from the NBBMA, with the remainder of the development located further away.

8.6.27 As the majority of impacts from the development are expected to be confined to the construction phase, the potential for cumulative effects on ornithological receptors in combination with the Proposed Development is considered to be negligible.

8.6.28 The HRA for the HyNet CO_2 Pipeline concluded that LSEs were identified during screening relating to air quality, disturbance, habitat loss, and impacts on qualifying features of designated sites (including the Mersey Estuary SPA/Ramsar) and functionally linked land, these were fully assessed through a Stage 2 Appropriate Assessment. A comprehensive suite of mitigation measures was proposed, including lighting and noise controls, pollution prevention, protected species licensing, and habitat reinstatement, all to be secured through the project's CEMP[65] and Register of Environmental Actions and Commitments (REAC). Following implementation of these measures, it was concluded that the development would not adversely affect the integrity of any European site, either alone or in combination with other plans or projects.

8.6.29 Impacts to redshank and the waterbird assemblage was identified through disturbance (noise and lighting) around the River Dee, which is to be mitigated through screening.

8.6.30 No adverse in-combination effects are anticipated because the HyNet CO_2 Pipeline will implement effective mitigation measures secured through the REAC and CEMP that address all identified impact pathways, including those affecting redshank and the waterbird assemblage. The Proposed Development and the HyNet Pipeline are unlikely to have overlapping construction activities in the same functional areas, due to the distances of over 3 km, location and nature (temporary) of the project from the Proposed Development.

[65] *HyNet North West (2023) Outline Construction Environmental Management Plan (OCEMP) Rev G. Available at: National Infrastructure Planning%20Rev%20G%20(Clean).pdf) (Accessed: 2 May 2025).*

8.6.31 As such, the integrity of the Mersey Estuary SPA, Ramsar site, and other relevant European sites will be maintained.

Ref 32 (Hydrogen Production Facility)

8.6.32 Located within the existing Stanlow industrial area (over 3 km away from the NBBMA), this facility does not encroach upon any sensitive ornithological habitats. As such, no significant cumulative ornithological effects are anticipated.

Ref 78 (Runcorn Carbon Dioxide Spur Pipeline)

8.6.33 The pipeline would run along the northern boundary of the Proposed Development. The pipeline specifically runs through cells 1 and 5 (SADA) and Cell 3 (the NBBMA). Cells 1 and 5 are considered sub optimal habitats comprising intensively grazed improved grassland and arable fields that provide relatively low foraging and roosting value for most non-breeding water birds and therefore, construction dust impacts are unlikely to affect the value of this habitat for non breeding birds significantly. It is anticipated that the implementation of the CEMPs for both projects would avoid significant cumulative effects occurring on matters such as water quality, flood risk, ground contamination, air quality and biodiversity.

8.6.34 Similar to the hydrogen pipeline the Applicant is committed to proactive collaboration throughout the construction phase with the applicant for the Runcorn Spur CO_2 pipeline. The **oCEMP [EN010153/DR/7.5]** sets out that the Applicant will co-ordinate where practicable on construction programmes and environmental mitigation measures.

8.6.35 The oCEMP sets out that the Applicant will establish a joint working group with the applicant of the Runcorn Spur Pipeline (and the HyNet Hydrogen pipeline if construction works coincide). This group will include inviting representatives from the construction teams of the relevant projects and from CWaCC. The purpose of the working group will be to coordinate and agree construction programming to prevent significant cumulative/in-combination effects, with particular emphasis on potential impacts on the Mersey Estuary SPA. CWaCC will then approve the relevant environmental management plans for each scheme that will incorporate the agreed measures, which would need to be approved before construction can commence. This ensures that appropriate controls will be in place to mitigate impacts.

8.6.36 In relation to programming and cooperation the full CEMP will provide that:

vi) Construction works would not be undertaken in Cells 1, 2 and 5 at the same time as the works being undertaken to create the NBBMA or construction of the pipeline in Cell 3.

vii) Should the Proposed Development and the Runcorn Carbon Dioxide Spur Pipeline be undertaking construction in Cells 1, 2, and 5, the Applicant would communicate with the developer of the Runcorn Carbon Dioxide Spur Pipeline (whether through the aforementioned working group, or separately) to enable that the works for both projects would be phased in order to avoid any potentially significant cumulative arising, for example, avoiding noisy activities from both projects being undertaken close to the boundary of the NBBMA at the same time. The details of the specific phasing agreed between the parties would be set out in the detailed CEMP submitted to CWaCC for approval; and

8.6.37 It is anticipated that similar controls could be implemented via the planning conditions on the Runcorn Carbon Dioxide Spur Pipeline on the basis that such a condition would be necessary to make the development acceptable; relevant to planning; relevant to the development to be permitted; enforceable; precise; and reasonable in all other respects, and to ensure that CWaCC can fulfil its duties as competent authority under the Habitats Regulations in respect of that project.

8.6.38 It is considered very likely that the project would involve similar construction techniques to the hydrogen pipeline and so would advance at a similar rate (approximately 150–350 metres per day). Given the short duration of disturbance associated with pipeline installation and the application of best-practice mitigation by both developments, significant cumulative effects on non-breeding waterbirds during the construction phase are considered unlikely. There remains a potential risk that poorly timed or poorly controlled construction of the Runcorn Spur CO_2 pipeline could temporarily constrain the functionality of the NBBMA; however, this risk is expected to be minimised through planning conditions, coordination between developers (including through the working group referred to above), and the adaptive management measures set out in the oNBBMS.

8.6.39 Within Cell 3, the pipeline is anticipated to run east–west along the northern boundary, immediately south of the canal ponds. Trenched construction is proposed

in this area by Liverpool Bay CCS Limited, with a trenchless crossing at the western edge of Cell 3 into Cell 4. The creation of the wetland within Cell 3 does not depend on groundwater flow from land to the north, and therefore the pipeline would not hinder wetland development.

8.6.40 Updated water balance modelling presented in the oNBBMS **[EN010153/DR/8.32]** confirms that wetland habitats in Cell 3 would be established and maintained by direct rainfall inputs, with groundwater exchange not essential to maintaining water levels.

8.6.41 In addition, the Runcorn Spur Pipeline Outline Environmental Management Plan commits, under reference RU-WR-023[66], to the installation of clay plugs within open trench sections to prevent the formation of preferential groundwater pathways and to retain shallow groundwater within Cell 3.

8.6.42 Therefore, if the pipeline is laid prior to or during the construction phase, then it is reasonable to assume that the water supply will be unaffected, nor will it disrupt water movement within the NBBMA.

8.6.43 In order to avoid a sequential impact, particularly if the pipeline is constructed shortly after the completion of the NBBMA and the construction of the solar array on Cell 1, 2 and 5, it is assumed that the pipeline planning permission would control the timing of works to minimise impacts on SPA qualifying features and require the full restoration of the NBBMA to the condition specified in the oNBBMS. However, this is a matter for CWaCC to consider when determining the application and discharging its duties as competent authority in respect of the Runcorn Spur CO_2 pipeline, noting that at present the applicant for the pipeline anticipates it to be constructed in advance of the creation of the NBBMA..

8.6.44 During the operational phase, the pipeline will be located underground and habitats reinstated following construction. As noted above the location of the pipeline will mean that it would not impact the functioning of the areas of the NBBMA proposed

[66] *Planning application reference 25_02108_FUL - OUTLINE ENVIRONMENTAL MANAGEMENT PLAN, Runcorn Carbon Dioxide Spur Pipeline, Document Reference Number RU.4.1*

for wet grassland, scrapes or open water. As such, no cumulative operational impacts on birds are anticipated.

8.6.45 Provided these measures are implemented, it can be concluded that no adverse in-combination effects on the integrity of the Mersey Estuary SPA and Ramsar site are expected.

8.7 Hobb Lane Solar (25/01339_FUL)

8.7.1 Located approximately 4 km south of the closest point of the Proposed Development (the NBBMA). The HRA concluded no LSEs, however Natural England advised that FLL should be assessed further (taken to AA) i.e. the potential role of the Site as FLL and the strength of the functional linkage. The updated HRA is not available for review.

8.7.2 Given the spatial separation between the two developments and the absence of credible impact pathways (e.g. disturbance, hydrological connectivity, air quality impacts etc.), the only receptor with potential for in-combination effects is qualifying species associated with the long-term and combined loss of FLL.

8.7.3 Qualifying species identified as potentially impacted by the Hobb Lane development include non-breeding pink-footed goose and curlew. Pink-footed goose were recorded on a single occasion over the three-year survey period, with no evidence of regular use or reliance on the habitats within the Order Limits for Frodsham Solar. On this basis, the Hobb Lane Solar Farm site is not considered to provide functionally important or core supporting habitat for this species. Accordingly, no species-specific mitigation has been proposed, however the proposed habitat measures delivered as part of the Frodsham Solar mitigation package will provide indirect benefits to this species beyond the existing baseline (managed short sward, habitat and disturbance).

8.7.4 Curlew is the only species taken forward here for the in-combination assessment. Based on the current data presented in the Hobb Lane HRA, curlew were recorded once within the Hobb Lane Solar Farm site boundary during January, with a peak count of 14 individuals, and more frequently within surrounding land outside of the site boundary which will be retained. This limited and infrequent use indicates that the Hobb Lane Solar Farm site provides a weak functionally linked role, with no

evidence that the land anticipated to be lost as part of the development is a regularly used/relied upon resource for curlew. The availability of more frequently used and higher-quality habitats in the surrounding area further reduces the importance of the Hobb Lane Solar Farm site.

8.7.5 Conversely, the mitigation proposed as part of the Frodsham Solar application includes the provision of substantial areas of habitat betterment and management to increase its existing carrying capacity (of up to 70.8 ha; excluding other enhancement areas), which are intended to function as a core resource for qualifying species, including curlew which were recorded up to 90 individuals and regularly (within the Order Limits) during the non-breeding period. The Order Limits is considered to form part of a core area of FLL associated with the Mersey Estuary SPA and Ramsar site.

8.7.6 When considered collectively, the very limited and infrequent use of the Hobb Lane Solar Farm site by curlew, together with the retention of higher supporting adjacent habitat and the provision of substantial habitat enhancement within the Proposed Development (Frodsham Solar), it is concluded that there would be no meaningful reduction in the availability, distribution, or functionality of supporting habitat at a scale relevant to the conservation objectives of the SPA.

8.7.7 No adverse effect on site integrity is therefore concluded in-combination.

8.8 In-combination Assessment Conclusion

8.8.1 A number of nearby developments have been reviewed for potential in-combination effects with the Proposed Development, particularly in relation to qualifying bird species and supporting habitats of the Mersey Estuary SPA and Ramsar site.

8.8.2 Several developments, including the Halton schemes (Refs 16 and 17), Encirc Automated Warehouse (Ref 33), and Protos schemes (Refs 20, 25, 27, 28, 31, 34, 35, and 81), are located at sufficient distance from the SADA and NBBMA, or lie within previously developed land of limited ornithological value. Their respective HRAs concluded no likely significant effects (LSEs) either alone or in combination, and mitigation strategies such as the Protos strategic ecological mitigation have already been implemented and are delivering benefits. As such, no adverse in-combination effects are predicted.

8.8.3 Although updates to the HRA are still pending for the Hobb Lane Solar Farm (25/01339_FUL), the conclusions made in this document remain unchanged. The Hobb Lane Solar Farm site is located up to 4 km away and is considered to have a weak functional role for curlew. Given the retention of areas used by curlew surrounding the Hobb Lane Solar Farm site, together with substantial habitat enhancements and management proposed within the Frodsham Solar development, which will increase its current carrying capacity; the combined effect will not affect the availability or function of supporting habitat (FLL). Therefore, no adverse effects on the integrity of the Mersey Estuary SPA and Ramsar site is concluded.

8.8.4 The HyNet Hydrogen Pipeline (Ref 38) lies approximately 0.5 km south of the NBBMA. While within 500 m of Functionally Linked Land (FLL), it does not intersect it and is located below (visually and acoustically screened) and is not located within identified FLL (Lordship Lane). A Stage 1 HRA screening concluded LSEs related to water and air quality, however best-practice construction-phase mitigation including timing of works (outside of the breeding season) and environmental management plans will be secured through the Development Consent Order (DCO), which would avoid the risk of impacts. As such, no significant in-combination effects are anticipated during either construction or operation.

8.8.5 The HyNet CO_2 Pipeline (Ref 37) is located over 3 km from the NBBMA and Proposed Development. A full Appropriate Assessment has been undertaken for that scheme, concluding no adverse effect on integrity following implementation of mitigation measures (e.g. lighting and noise controls, pollution prevention, and habitat reinstatement). Given the separation distance and nature of the project, no cumulative effects with the Proposed Development are expected.

8.8.6 The Hydrogen Production Facility (Ref 32) is situated within the Stanlow industrial area and is unlikely to contribute to cumulative ornithological impacts due to the absence of suitable habitat and the location of the development.

8.8.7 The Runcorn CO_2 Spur Pipeline (Ref 78) would run along the northern boundary of the Proposed Development, including through Cells 1, 3, and 5. Its impacts are anticipated to be similar in nature and scale to other linear infrastructure. The Applicant proposes a coordinated, phased construction programme to avoid simultaneous disturbance within key areas and reduce cumulative effects. Mitigation

will include avoidance of noisy works during sensitive periods (non-breeding season) and avoidance of overlap in areas of shared habitat use.

8.8.8 Given the temporary nature of pipeline construction (150–350 m per day), the commitment to habitat reinstatement, and the adoption of best-practice mitigation across both projects, significant cumulative effects on non-breeding waterbirds are considered unlikely during construction.

8.8.9 On the basis of the above it is concluded that no adverse in-combination effects on the integrity of the Mersey Estuary SPA and Ramsar site are anticipated.

9.0 CONCLUSION STAND ALONE AND IN-COMBINATION

9.1.1 This AA has considered the implications of the Proposed Development for the Mersey Estuary SPA and Ramsar site, including all relevant impact pathways, conservation objectives, and the potential for in-combination effects with other plans and projects. The assessment recognises that construction of the SADA will result in the long-term loss of FLL used by qualifying non-breeding waterbirds and the wider waterbird assemblage. While this majority of the land comprises sub-optimal habitats such as intensively grazed improved grassland and arable fields it nevertheless supports supplementary foraging and roosting activity by SPA qualifying bird species and waterbird assemblage.

9.1.2 To mitigate the loss of the FLL, a purpose-designed NBBMA will be delivered in advance of SADA construction. The NBBMA will provide 70.81 ha of high-quality, actively managed wetland and grassland habitat, tailored to meet the ecological needs of SPA qualifying features. Its design, timing of delivery, and long-term management will offset the loss of lower-value habitat within the SADA and ensure no net loss of functional capacity for the bird populations concerned. The NBBMA also extends the ecological mitigation secured under the existing Frodsham Wind Farm beyond its original lifespan, providing continuity and enhancement of FLL. Success criteria for the NBBMA to achieve the clear Aims that are set out in the oNBBMS, including hydrological performance (water level ranges and storage capacity), vegetation condition (sward structure, cover and control of invasive species), and continued use by SPA qualifying species and assemblage species – will be agreed with the local planning authority in consultation with Natural England as secured via DCO Requirement.

9.1.3 To minimise disturbance to functionally linked land (FLL) and maintain habitat availability for SPA qualifying species no construction works will commence on the SADA until the NBBMA is functional. This approach ensures that the NBBMA provides effective mitigation while construction of the Proposed Development progresses. By maintaining a functional buffer zone between active works and sensitive areas, this strategy reduces the risk of disturbance-related displacement and supports the conservation objectives of the Mersey Estuary SPA and Ramsar site throughout the construction phase.

9.1.4 Cumulative effects in combination with other developments such as the HyNet Hydrogen Pipeline and the Runcorn Carbon Dioxide Spur Pipeline, one of which intersect the Order Limits have been considered. While both projects have the potential to impact FLL (directly and indirectly) during construction, effective mitigation measures (including seasonal restrictions, habitat reinstatement, project liaison and CEMPs) are either secured or expected. Provided that construction activities are appropriately phased, no adverse in-combination effects on the Mersey Estuary SPA and Ramsar site are anticipated.

9.1.5 While the SADA will no longer support SPA qualifying species, the creation and long-term management of high-quality wetland habitats within the NBBMA will provide significant ecological gains. These habitats comprising wet grassland, scrapes, and open water will exceed like-for-like mitigation requirements by delivering enhanced foraging, roosting, and loafing opportunities for displaced and additional wetland bird species. The NBBMA will be managed adaptively by an experienced nature conservation organisation, supported by ecological monitoring, and will also improve a degraded section of the Mersey Estuary SSSI by replacing invasive-dominated fishing pools with diverse wetland features. Works within the SSSI, including eradication and long-term control of NZPW and reinstatement of waterbodies, are necessary to restore the SSSI unit and to enable the NBBMA to function as designed; they are not counted as additional “credit” in habitat replacement calculations beyond their role in delivering the overall mitigation package. Given the absence of comparable managed wetland reserves along the Mersey Estuary, the NBBMA represents a strategically valuable habitat resource for passage and overwintering SPA species. With minimal disturbance expected during operation and visitor access carefully managed through screening and path design, the Proposed Development is assessed to deliver significant beneficial effects in the short term, increasing to beneficial significant effects in the medium to long term for the Mersey Estuary SPA/Ramsar site.

9.1.6 In conclusion, with the successful implementation of the proposed mitigation measures including early delivery and long-term management of the NBBMA and adherence to the phasing strategy, the Proposed Development will not result in an adverse effect on the integrity of the Mersey Estuary SPA or Ramsar site, either alone or in combination with other plans or projects.

9.1.7 This conclusion is made in accordance with Regulation 63 of the Conservation of Habitats and Species Regulations 2017 (as amended), and all mitigation and phasing commitments are secured through the DCO and associated environmental management plans.

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FIGURES

Order Limits/Site

Main Development Area
Breeding Birds

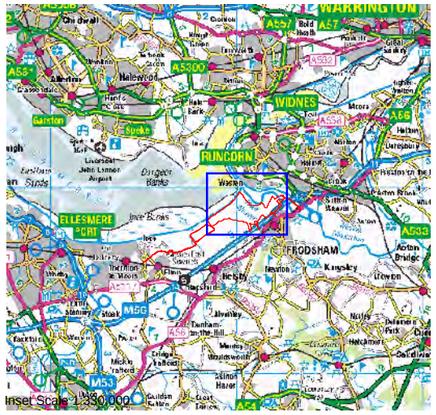
600m Development Buffer
Wintering Birds

1km Development Buffer
Species of Principal Importance
Non-statutory designated sites for nature conservation with cited ornithological interests

2km Development Buffer
Statutory designated sites for nature conservation (excluding geological sites) with cited ornithological interests

10km Development Buffer
Statutory designated sites for nature conservation (excluding geological sites) with cited ornithological interests– International

Minor update to the Order Limits made April 2025



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FRODSHAM SOLAR
HABITATS REGULATIONS ASSESSMENT

Figure Number

1

Figure Title

Zones of Influence

Scale

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Date

May 2025

Order Limits/Site

Main Development Area

10km Development Buffer

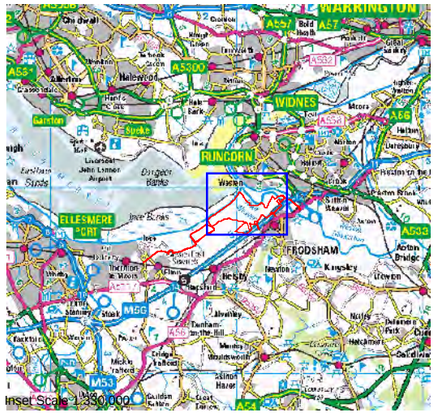
Designated Site

Site of Special Scientific Interest (SSSI)

Special Protection Area (SPA)

Ramsar Site

Minor update to the Order Limits made April 2025



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FRODSHAM SOLAR
HABITATS REGULATIONS ASSESSMENT

Figure Number

2

Figure Title

Statutory Designated Sites for Nature Conservation

Scale

1:85000@A3

Date

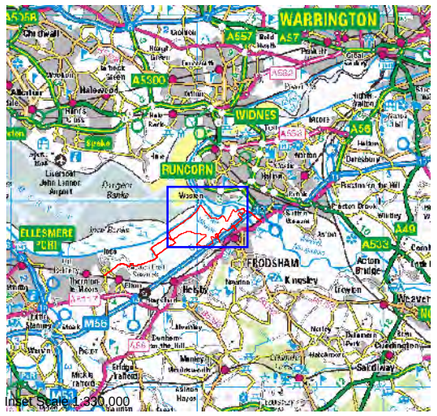
May 2025

Order Limits/Site

Designated Site

Special Protection Area (SPA)

Ramsar



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FRODSHAM SOLAR
HABITATS REGULATIONS ASSESSMENT

Figure Number

2a

Figure Title

Mersey Estuary (SPA and Ramsar)

Scale

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Date

May 2025

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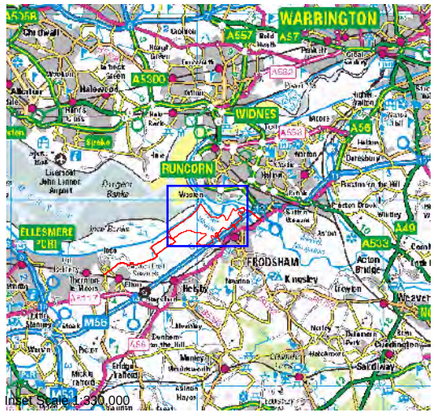
kilometers



Order Limits/Site

Designated Site

Site of Special Scientific Interest (SSSI)



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FRODSHAM SOLAR
HABITATS REGULATIONS ASSESSMENT

Figure Number

2b

Figure Title

Mersey Estuary (SSSI)

Scale

1:26000@A3

Date

May 2025

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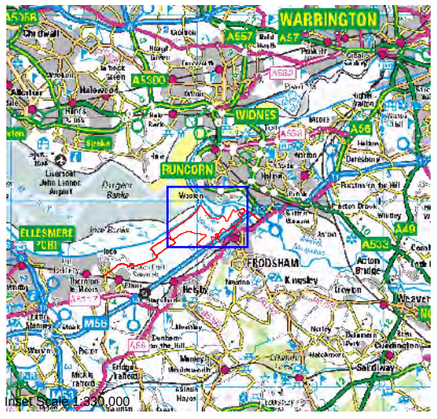
kilometers

Order Limits/Site

10km Main Development Buffer

Designated Site

Ramsar



Midland Meres & Mosses - Phase 1

Midland Meres & Mosses Phase 2

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kilometers

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FRODSHAM SOLAR HABITATS REGULATIONS ASSESSMENT

Figure Number

2c

Figure Title

Midland Meres & Mosses Phase 1&2 (Ramsar)

Scale

1:26000@A3

Date

May 2025

Order Limits

20km Buffer

Watercourse (with flow direction)

RAMSAR Site

Midland Meres & Mosses - Phase 1

Midland Meres & Mosses Phase 2



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Project

FRODSHAM SOLAR ENVIRONMENTAL STATEMENT

Figure Number

2d

Figure Title

MIDLAND MERES AND MOSSES PHASE1 AND PHASE 2 RAMSAR SITES - 20KM (HYDROLOGICAL BUFFER)

Scale

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Date

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kilometres

Order Limits/Site

Main Site Access with Private Wire Connection

Main Site Access without Private Wire Connection

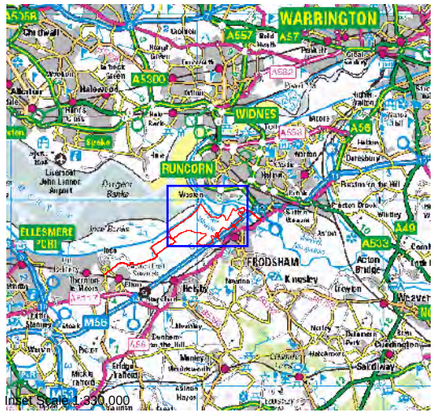
Non-Breeding Bird Mitigation Area

Skylark Mitigation Area

Solar Array Development Area

SPEN

SPEN Grid Connection



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Project

FRODSHAM SOLAR
HABITATS REGULATIONS ASSESSMENT

Figure Number

3

Figure Title

Proposed Development Areas

Scale

1:26000@A3

Date

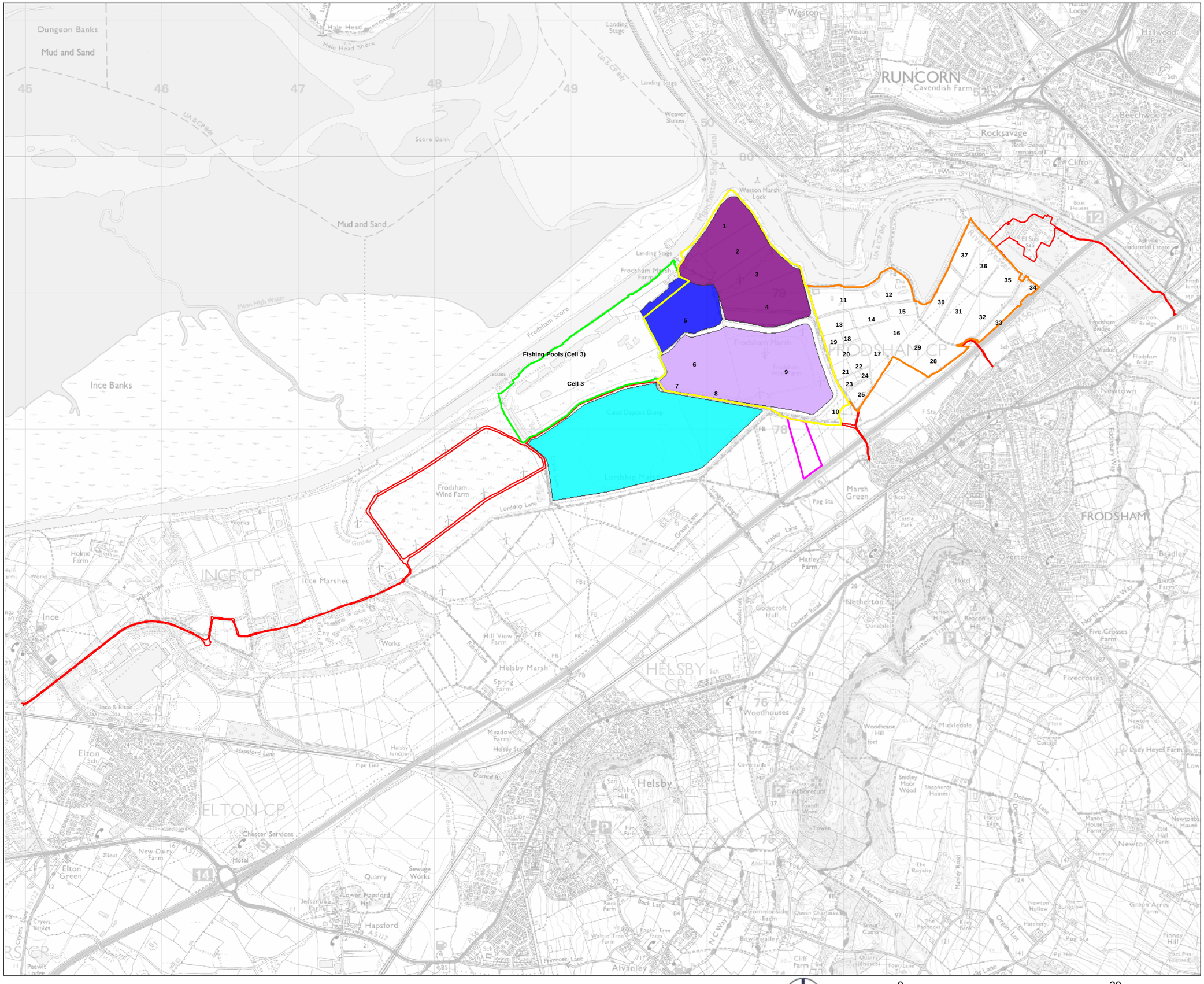
May 2025

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FRODSHAM SOLAR
HABITATS REGULATIONS ASSESSMENT

Figure Number

4

Figure Title

Proposed Development Areas - With Cells

Scale

1:26000@A3

Date

May 2025

Appendix 1: BTO Data, Five-year peak monthly counts of each species – Mersey Estuary SPA, Frodsham Sludge Lagoons and Weston Marshes

Table 1: Five-year peak monthly counts of each species 2019/24 – Mersey Estuary SPA

Species	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Brent Goose (Dark-bellied - bernicla)	0	0	0	0	1	0	0	0	0	0	0	0
Red-breasted Goose	0	0	0	0	0	0	0	0	0	1	0	0
Canada Goose	11154	7211	9530	6777	9101	7525	7123	1549	3295	720	1152	18935
Canada x Greylag Goose	0	0	0	6	0	1	0	1	1	1	1	0
Barnacle Goose	0	6	0	12	8	0	0	9	5	4	2	1
Greylag Goose (British/Irish)	91	40	45	11	48	2	17	60	48	18	20	146
Greylag Goose (Icelandic)	0	0	0	0	0	0	2	0	0	0	0	0
Domestic Greylag Goose	7	0	1	3	1	11	9	6	11	12	7	12
Pink-footed Goose	1	0	200	3950	6244	1760	9783	2455	30738	7360	1	0
Black Swan	0	0	0	0	0	0	0	0	0	0	0	1
Mute Swan	32	20	26	68	43	35	41	34	29	14	29	40
Bewick's Swan	0	0	0	0	0	0	4	0	0	0	0	0
Whooper Swan	0	0	1	1	12	25	26	29	28	1	0	0
Egyptian Goose	2	0	0	14	8	0	0	0	0	0	0	1
Shelduck	13704	8940	8672	1961	2177	2957	2352	2305	3220	1896	1996	8248
Ruddy Shelduck	2	1	1	3	2	0	1	0	0	1	1	6
Garganey	2	3	3	0	0	0	0	0	4	5	0	2
Shoveler	22	289	295	351	294	163	196	155	160	142	43	61
Gadwall	36	96	88	108	78	57	47	70	138	84	91	60
Wigeon	3	1	228	1225	1522	3109	4751	912	2431	37	4	0
Mallard	391	1046	765	964	769	584	791	625	308	254	345	623

Domestic Mallard	0	1	0	0	1	0	0	0	2	0	0	0
Pintail	0	0	67	416	89	74	163	99	60	11	3	0
Teal	37	394	1290	2598	3242	2717	8154	3133	1151	399	31	87
Green-winged Teal	0	0	0	0	0	0	0	0	0	1	0	0
Pochard	1	2	6	14	95	45	88	56	27	0	5	16
Tufted Duck	103	141	261	338	353	398	471	310	150	121	227	155
Scaup	0	0	0	0	0	0	0	0	0	0	0	122
Eider (except Shetland)	7	0	0	0	0	0	1	0	1	1	0	0
Common Scoter	0	1	7	0	3	0	0	0	0	0	0	2
Long-tailed Duck	0	0	0	0	0	0	0	1	1	0	0	0
Goldeneye	0	1	0	1	18	19	14	27	26	1	0	0
Goosander	0	0	0	1	0	1	7	0	0	1	0	0
Red-breasted Merganser	0	0	0	0	3	0	0	0	0	0	0	0
Great Northern Diver	0	0	0	0	1	0	0	0	0	0	0	0
Little Grebe	30	45	44	42	35	51	12	16	21	20	15	19
Great Crested Grebe	29	70	94	66	59	31	35	54	43	50	69	82
Black-necked Grebe	0	2	0	0	0	0	0	0	0	2	0	0
Bittern	0	0	0	0	1	0	0	0	0	0	0	0
Cattle Egret	0	1	0	5	3	2	4	13	12	15	14	26
Grey Heron	41	63	90	94	92	84	97	54	34	32	39	52
Great White Egret	3	10	15	20	15	9	11	9	12	2	4	9
Little Egret	203	127	211	173	123	51	85	89	96	146	72	139
Shag	0	0	0	0	0	1	0	1	3	0	0	0
Cormorant	826	462	467	467	222	138	228	183	343	418	409	850
Water Rail	0	2	1	3	6	4	3	6	4	2	1	0
Moorhen	48	52	57	58	53	51	49	41	62	34	31	36
Coot	165	322	195	171	160	183	273	205	176	72	102	149

Oystercatcher	455	643	741	785	881	877	792	687	884	405	273	227
Avocet	136	60	230	41	7	2	0	66	282	110	79	288
Lapwing	994	1123	1284	3734	5056	4624	6202	5121	638	191	64	983
Golden Plover	2	259	137	1981	1116	1158	3132	1500	971	331	3	56
American Golden Plover	0	1	0	0	0	0	0	0	0	0	0	0
Grey Plover	5	235	310	404	366	450	370	320	609	180	18	21
Ringed Plover	30	1791	491	298	322	305	358	165	64	50	136	15
Little Ringed Plover	23	4	0	0	0	0	0	0	0	12	12	5
Whimbrel	19	10	7	6	0	0	0	0	1	15	48	0
Curlew	532	1721	1915	1183	1342	1186	1202	850	681	853	116	178
Bar-tailed Godwit	530	294	257	38	128	12	106	29	40	26	3	4
Black-tailed Godwit	4787	5687	5138	4739	1860	1072	3652	3323	5975	4929	897	1793
Turnstone	25	261	724	377	232	396	350	374	211	316	32	56
Knot	1	9	26	62	32	50	218	300	191	40	8	6
Ruff	8	14	23	26	12	2	8	13	14	13	2	1
Curlew Sandpiper	2	0	4	14	0	0	0	0	0	0	4	0
Sanderling	6	4	0	2	4	0	1	107	34	0	4	0
Dunlin	1075	2707	1502	9432	37884	40966	66284	30131	36036	1718	2891	62
Purple Sandpiper	0	0	4	1	9	6	10	6	5	4	0	0
Little Stint	3	1	4	3	1	2	1	1	1	0	1	0
Pectoral Sandpiper	1	0	0	0	0	0	0	0	0	0	0	0
Long-billed Dowitcher	0	1	0	0	0	0	0	0	0	0	0	0
Woodcock	0	1	0	0	1	2	1	0	0	0	0	0
Jack Snipe	0	0	0	3	5	2	20	2	4	0	0	0
Snipe	5	14	37	120	53	74	108	58	32	11	1	1
Common Sandpiper	11	10	9	11	2	5	2	1	1	9	11	4
Green Sandpiper	2	3	1	2	1	1	3	3	1	1	0	0

Redshank	2323	3468	7498	4011	12896	5140	5055	3136	8225	3040	18	407
Wood Sandpiper	1	1	0	0	0	0	0	0	0	1	0	0
Spotted Redshank	5	1	0	1	1	0	0	1	1	0	0	2
Greenshank	2	8	11	3	1	0	0	0	0	2	0	0
Kittiwake	0	0	0	0	0	0	0	0	0	2	0	0
Black-headed Gull	12162	10326	7187	6697	4376	3184	2630	2557	1620	306	922	2272
Little Gull	1	0	0	0	0	0	0	0	0	7	1	1
Mediterranean Gull	6	5	3	2	2	1	1	2	2	3	2	1
Common Gull	33	204	103	77	81	105	275	398	87	51	51	42
Great Black-backed Gull	101	258	620	564	695	147	177	64	165	47	63	100
Iceland Gull	0	0	0	0	0	0	1	0	0	0	0	0
Herring Gull	684	602	1344	668	602	273	1227	386	472	281	618	405
Yellow-legged Gull	2	1	4	1	1	0	1	0	0	0	0	0
Lesser Black-backed Gull	1274	1199	929	372	132	95	90	54	126	293	472	416
Little Tern	0	0	0	0	0	0	0	0	0	0	2	0
Common Tern	42	5	1	0	0	0	0	0	0	1	30	38
Arctic Tern	1	0	0	0	0	0	0	0	0	0	0	0
Kingfisher	1	2	4	3	1	1	1	2	0	0	1	1

Table 2: Five-year peak monthly counts of each species 2019/24 – Frodsham Sludge Lagoons

Species	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Red-breasted Goose	0	0	0	0	0	0	0	0	0	1	0	0
Canada Goose	430	322	122	1000	374	176	865	278	400	43	76	245
Canada x Greylag Goose	0	0	0	6	0	1	0	1	1	1	1	0
Barnacle Goose	0	0	0	0	0	0	0	0	0	2	0	0
Greylag Goose (British/Irish)	12	8	2	0	14	0	6	15	14	12	14	11
Domestic Greylag Goose	0	0	0	3	0	11	9	6	11	12	0	0
Pink-footed Goose	0	0	0	459	560	436	458	890	562	36	0	0
Mute Swan	5	6	2	4	11	5	6	6	7	6	14	8
Whooper Swan	0	0	0	0	0	1	0	0	0	0	0	0
Shelduck	51	89	54	78	16	36	43	65	111	147	51	43
Garganey	2	3	1	0	0	0	0	0	4	3	0	2
Shoveler	18	151	258	323	279	146	148	145	141	134	43	61
Gadwall	19	40	14	24	24	14	17	25	14	12	31	13
Wigeon	0	1	59	64	43	27	17	24	75	11	3	0
Mallard	104	109	91	87	54	63	57	56	61	50	54	80
Pintail	0	0	67	39	23	36	19	58	25	7	3	0
Teal	26	322	475	990	743	563	1013	756	350	217	23	87
Green-winged Teal	0	0	0	0	0	0	0	0	0	1	0	0
Pochard	0	0	0	12	25	21	11	25	17	0	0	13
Tufted Duck	67	32	161	142	126	21	12	50	46	43	61	79
Goldeneye	0	0	0	0	1	2	6	2	7	0	0	0
Little Grebe	19	31	38	31	29	29	12	12	17	11	11	7
Great Crested Grebe	0	0	0	0	0	0	0	1	0	0	2	1
Black-necked Grebe	0	2	0	0	0	0	0	0	0	2	0	0

Cattle Egret	0	0	0	0	0	0	3	3	0	0	3	0
Grey Heron	4	6	3	4	4	4	5	4	4	3	6	3
Little Egret	1	2	2	8	2	5	1	2	3	1	4	2
Cormorant	7	4	4	4	4	3	2	4	7	4	2	2
Water Rail	0	2	1	3	6	3	3	5	4	2	1	0
Moorhen	17	17	17	12	14	21	16	14	17	6	12	9
Coot	37	45	34	24	17	83	101	103	80	31	17	17
Oystercatcher	4	4	6	0	0	0	0	4	3	14	6	4
Avocet	14	1	51	14	0	0	0	1	0	4	9	24
Lapwing	204	457	325	745	500	2359	1890	1000	501	14	10	82
Golden Plover	1	0	1	350	0	908	1045	411	550	0	3	0
Grey Plover	0	0	0	26	0	0	0	0	0	0	0	0
Ringed Plover	5	80	15	0	0	0	0	21	0	0	19	15
Little Ringed Plover	7	4	0	0	0	0	0	0	0	4	4	4
Whimbrel	0	0	0	0	0	0	0	0	0	4	0	0
Curlew	4	14	2	322	100	208	200	210	121	29	7	4
Bar-tailed Godwit	0	2	3	5	1	0	3	28	25	20	3	4
Black-tailed Godwit	2555	4200	3885	2500	1597	151	667	1500	2109	2000	834	1554
Knot	1	4	12	61	0	0	14	0	21	2	8	4
Ruff	6	14	23	24	1	0	4	8	8	12	2	1
Curlew Sandpiper	0	0	2	14	0	0	0	0	0	0	0	0
Sanderling	0	2	0	0	0	0	0	0	0	0	0	0
Dunlin	768	1000	31	2000	0	0	1	1	500	38	25	12
Little Stint	0	1	0	2	0	0	0	0	0	0	1	0
Pectoral Sandpiper	1	0	0	0	0	0	0	0	0	0	0	0
Long-billed Dowitcher	0	1	0	0	0	0	0	0	0	0	0	0
Woodcock	0	0	0	0	0	0	1	0	0	0	0	0

Jack Snipe	0	0	0	0	1	0	0	0	1	0	0	0
Snipe	1	9	32	77	16	34	23	16	14	4	1	1
Common Sandpiper	2	3	3	1	0	0	0	0	0	2	1	0
Green Sandpiper	2	0	1	1	0	0	0	0	0	0	0	0
Redshank	600	245	378	45	6	11	45	31	4	6	3	34
Wood Sandpiper	1	1	0	0	0	0	0	0	0	1	0	0
Spotted Redshank	3	1	0	0	0	0	0	0	0	0	0	2
Greenshank	2	2	2	1	0	0	0	0	0	1	0	0
Black-headed Gull	273	200	171	874	312	256	500	171	137	131	76	431
Little Gull	0	0	0	0	0	0	0	0	0	6	0	0
Mediterranean Gull	0	0	0	0	0	0	0	1	2	2	0	0
Common Gull	9	57	45	15	9	8	60	45	53	34	3	6
Great Black-backed Gull	0	2	1	1	0	2	0	0	2	2	2	0
Herring Gull	3	2	4	3	4	1	3	1	2	14	5	1
Lesser Black-backed Gull	2	7	3	1	4	2	3	1	6	11	37	3
Kingfisher	0	1	1	1	1	0	1	0	0	0	0	0

Table 3: Five-year peak monthly counts of each species 2019/24 – Weston Marshes

Species	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Canada Goose	17	0	0	0	0	0	0	0	4	3	8	2
Shelduck	6	0	0	0	0	0	2	0	0	6	6	8
Shoveler	0	0	0	0	0	0	0	0	1	3	5	0
Gadwall	0	0	0	0	0	0	0	0	0	4	2	0
Mallard	9	9	0	0	0	0	3	2	6	9	13	9
Pintail	0	0	0	0	0	0	0	0	3	0	0	0
Teal	4	5	56	1	0	0	0	10	66	28	0	0
Tufted Duck	0	0	0	0	0	0	0	0	0	0	2	2
Grey Heron	0	1	1	0	1	0	0	0	0	2	1	1
Great White Egret	0	2	0	0	0	0	0	0	0	0	0	0
Little Egret	0	2	2	2	1	1	1	1	1	1	1	0
Moorhen	0	0	0	0	3	1	8	6	3	2	1	0
Coot	0	0	0	0	0	0	0	10	13	5	5	2
Oystercatcher	2	0	0	0	0	0	0	0	0	0	0	0
Lapwing	3	1	96	0	0	0	0	7	8	13	7	4
Ringed Plover	0	0	0	0	0	0	0	0	0	1	0	0
Black-tailed Godwit	0	1	44	0	0	0	0	0	1	7	0	296
Ruff	0	0	0	0	0	0	0	0	1	2	0	0
Snipe	0	0	19	0	0	0	0	0	0	2	0	0
Common Sandpiper	1	0	0	0	0	0	0	0	0	0	0	0
Redshank	0	1	1	0	0	0	3	2	0	1	1	0
Black-headed Gull	3	0	0	0	8	6	26	1	7	22	2	7
Common Gull	0	0	0	0	0	0	0	0	1	0	0	0

Appendix 2: Noise Technical Note in response to Natural Englands (NE) Relevant Representations RR-012 [EN010153]

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Frodsham Solar Ltd

Tel No: 01773 603331
E-mail: nvc.acoustics@btopenworld.com

Date: 21st September 2025
Our Ref: [redacted]

Ref: Frodsham Solar, Frodsham Marsh, Frodsham NSIP
Reference EN010153
Frodsham Solar Ltd
Noise Technical Note in response to Natural England's (NE)
Relevant Representations RR-012

This technical note has been prepared in response to matters raised within Natural England's relevant representation (RR-012), specifically NE key issue reference NE23. The information contained in this note supplements the Noise Impact Assessment (APP-054) provided as Appendix 4-1 to the Environmental Statement.

Technical Note

This Technical Note provides further details and analysis in relation to predicted noise levels resulting from the construction of the Proposed Development, specifically in relation to ecological noise sensitive receptors associated with the Mersey Estuary Special Protection Area (SPA).

Natural England's relevant representation, key issue NE23 provides the following advice:

"Natural England advises mapping of predicted noise contours in 5dB increments from 55dB upwards for both LAeq and LAmax levels. This way it can be clearly seen how much of an SPA (or area of FLL) will be affected by different noise levels (not just above 70dB) compared to the baseline.

Appendix 5 of Appendix 4-1 includes the noise mapping results. However, the SPA is the key ecological receptor and is difficult to discern clearly on the maps. The majority of the construction noise maps are presented as LAeq only. In particular, maps 7-15 present the noise modelling for various different piling options, but not in LAmax contours. It is important to know how far into the SPA the different LAmax contours extend, to be able to determine whether the birds using the site will be affected, and whether mitigation is required. Birds are most impacted by loud, sudden noises, like those from piling works, which are best characterised by LAmax, as they can be hidden in average noise levels.

We note that mitigation measures will be applied for noise where needed and that disturbance distances have been derived however, we question how practical it will be to ensure different distances (for weekdays and Saturdays) are adhered to on-site whilst works are being undertaken and advise simplification of any noise buffer distances."

The noise mapping for the construction phase works presented in Volume 2 Appendix 4-1: Noise Impact Assessment of the Environmental Statement (APP-054) (the 'ES NIA') have been updated to provide a clearer series of figures that illustrate the noise contour lines for peak noise activities. They also include the indicative layout of the Proposed Development and show the boundary of the Mersey Estuary SPA. The updated figures are attached as Appendix 1 and 2 and provide noise contours in terms of L_{Amax} and L_{Aeq} indices. Additional noise maps have also been provided to illustrate more accurately potential peak noise activities in Cells 2 and 6.

In order to illustrate L_{Amax} levels, L_{Amax} data for the noisiest items of plant proposed to be used has been included within the noise models. The noise levels are based on extensive experience and library data from site measurements taken over the past 25 years. The levels are based on typical L_{Amax} levels, which are deemed to provide a good representation of what would be expected in practice.

The contours are considered conservative on the basis that L_{Amax} levels are measured over 125ms using a fast response setting and so represent the highest `A' weighted RMS sound level over the measurement period. The calculation assumes all plant operates simultaneously, resulting in a cumulative effect rather than just the highest L_{Amax}.

In terms of the comparison with the ambient L_{Amax} levels, the 'range' and 'average' L_{Amax} recorded from on-site measurements at baseline monitoring locations have been used (refer to Figure 1 attached showing the locations referred to in the ES NIA for ease of reference). The noise model predictions are based on BS5228 for L_{Aeq} analysis and ISO9613-2 calculation methodology for L_{Amax}. Refer to Figure 2 for the location of the Noise Sensitive Ecological Receptors (NSER).

Tables 1 and 2 below provide a comparison of the noise prediction results and analysis to help interpret the noise mapping results at the NSERs. These tables provide a similar comparison to Table 5.2 in the ES NIA but with additional detail, including separate tables for L_{Aeq} and L_{Amax}.

Table 1: Noise Predictions for Worst Case Construction Noise at NSER (excluding mitigation measures) based on LAeq levels

NSER Position (Refer to Figure 2)	Works	Typical Ambient Noise Levels Average L_{Aeq} dB [Range]	Average L_{Aeq} dB +3dB	Predicted Noise Levels L_{Aeq} dB	Exceedance of Average L_{Aeq} +3dB	Noise Map Reference
E1: Cells 2 & 5 (During NBBMA works in Cell 3)	NBBMA Cell 3	Position E: Sat Av. **50** [Range:48-52] Week: Av. **57** [Range: 52-64]	Sat. **53** Week: **60**	**41-55** **41-55**	+2dB (Saturday) None (weekday)	1 to 6 1 to 6
E2. Cell 3 (following Completion of NBBMA)	Piling (mini) Piling (BESS) Site Preparation General site activities Infrastructure PV Installation	Position E: Sat Av. **50** [Range:48-52] Week: Av. **57** [Range: 52-64]	Sat. **53** Week: **60**	**33-54** **43-45** **42-59** **47-59**[1] **34-51**[2] **44-59**	+1dB (Sat) None +6dB (Sat) +6dB (Sat) None +6dB (Sat)	7 to 14 & 17 15 to 16 10 to 13 & 19 - - 10 to 13 & 19
E3. Sections of the River Weaver (north-east and east of Cell 1)	NBBMA Cell 3 Piling (mini) Piling (BESS) Site Preparation General site activities Infrastructure PV installation	Position F: Sat. Av. **55** [Range:54-59] Week Av. **58** [Range: 54-62]	Sat. **58** Week. **61**	**29-35** **23-55** **31-41** **37-57** **42-54**[1] **29-49**[2] **39-55**	None None None None None None None	1 to 6 7 to 14 & 17 15 to 16 10 to 13 - - 10 to 13

NSER Position (Refer to Figure 2)	Works	Typical Ambient Noise Levels Average L_{Aeq} dB [Range]	Average L_{Aeq} dB +3dB	Predicted Noise Levels L_{Aeq} dB	Exceedance of Average L_{Aeq} +3dB	Noise Map Reference
E4. Cell 6	NBBMA Cell 3	Position D:	Sat. **71**	**31-47**	None	1 to 6
	Piling (mini)	Sat. Av. **68**	Week. **72**	**31-47**	None	7 to 14 & 17
	Piling (BESS)	[Range:66-69]		**42-48**	None	15 to 16
	Site Preparation	Week Av. **69**		**37-55**	None	18
	General site activities	[Range: 66-69]		**42-54**[1]	None	-
	Infrastructure	Position G)		**29-55**[2]	None	-
	PV Installation	Week Av. 62[3] [Range 59-64]	Week. **65**[3]	**39-55**	None	17
E5. Mersey Estuary SPA, Ramsar & SSSI to north of Cell 2 & NBMAA	NBBMA Cell 3	Position E:	Sat. **53**	**37-51**	None	1 to 6
	Piling (mini)	Sat Av. **50**	Week: **60**	**24-52**	None	7 to 14 & 17
	Piling (BESS)	[Range:48-52]		**31-35**	None	15 to 16
	Site Preparation	Week: Av. **57**		**33-54**[1]	None (+2dB Sat)	10 to 13
	General site activities	[Range: 52-64]		**40-52**[2]	None	-
	Infrastructure			**30-49**	None	-
	PV installation			**35-56**	None (+3dB Sat)	10 to 13

[1]General site activities assumed to be minimum 100m distance, levels vary according to landform heights differences at NSER.

[2]Infrastructure based on concreting works at nearest likely location to NSER.

[3]Based on short-term measurement.

Table 2: Noise Predictions for Worst Case Construction Noise at NSER (excluding mitigation measures) based on LAmax levels

NSER Position (Refer to Figure 2)	Works	Typical Ambient Noise Levels Average L_{Amax} dB [Range]	Average L_{Amax} dB or within the range	Predicted Noise Levels L_{Amax} dB	Exceedance of Average L_{Amax} dB or within range	Noise Map Reference
E1: Cells 2 & 5 (During NBBMA works in Cell 3)	NBBMA Cell 3	Position E: Sat Av. **62** [Range:59-76] Week: Av. **69** [Range:59-76]	Sat Av. **62** Week Av.**69**	**46-60** **46-60**	None None	1 to 6 1 to 6
E2. Cell 3 (following Completion of NBBMA)	Piling (mini)	Position E:	Sat Av. **62**	**41-62**	None	7 to 14 & 17
	Piling (BESS)	Sat Av. **62**		**53-57**	None	15 to 16
	Site Preparation	[Range:59-76]	Week Av.**69**	**48-70**	+8dB (Sat) 1dB (week) in range	10 to 13 & 19
	General site activities	Week: Av. **69**		**52-64**	+2dB (Sat) but within range	-
	Infrastructure	[Range:59-76]		**44-61**	None	-
	PV Installation			**54-70**	+8dB (Sat) 1dB (week) in range	10 to 13 & 19
E3. Sections of the River Weaver (north-east and east of Cell 1)	NBBMA Cell 3	Position F:	Sat Av. **67**	**37-47**	None	1 to 6
	Piling (mini)	Sat. Av. **67**		**31-59**	None	7 to 14 & 17
	Piling (BESS)	[Range:57-74]	Week Av.**66**	**41-49**	None	15 to 16
	Site Preparation	Week Av. **66**		**43-63**	None	10 to 13
	General site activities	[Range:58-76]		**47-59**	None	-
	Infrastructure			**39-59**	None	-
	PV installation			**49-62**	None	10 to 13
E4. Cell 6	NBBMA Cell 3	Position D:	Sat Av. **74**	**36-55**	None	1 to 6
	Piling (mini)	Sat. Av. **74**		**39-42**	None	7 to 14 & 17
	Piling (BESS)	[Range:70-84]	Week Av.**74**	**49-54**	None	15 to 16
	Site Preparation	Week Av. **74**		**47-59**	None	18
	General site activities	[Range:71-83]		**47-59**	None	-
	Infrastructure	Position G)		**39-65**	None	-
	PV Installation	Week Av. **68**[1] [Range 67-70]	Week Av.**68**	**49-60**	None	17
E5. Mersey Estuary SPA, Ramsar & SSSI to north of Cell 2 & NBMAA	NBBMA Cell 3	Position E:	Sat Av. **62**	**42-55**	None	1 to 6
	Piling (mini)	Sat Av. **62**		**31-55**	None	7 to 14 & 17
	Piling (BESS)	[Range:59-76]	Week Av.**69**	**34-40**	None	15 to 16
	Site Preparation	Week: Av. **69**		**39-61**	None	10 to 13
	General site activities	[Range:59-76]		**45-57**	None	-
	Infrastructure			**40-59**	None	-
	PV installation			**41-59**	None	10 to 13

[1]Based on short-term measurement.

The predicted maximum noise level at the ecological NSER during the construction phase, excluding any proposed mitigation measures, would not exceed the threshold of the average L_{Aeq} +3dB or the average L_{Amax} dB, except during the following phase of working:

(i) During the NBBMA works in Cell 3, on a Saturday morning, the noise levels increase above the L_{Aeq} +3dB threshold by +2dB at the NSER in the SSSI to the north of Cell 3 when the plant is at its closest approach. Levels remain within the threshold at circa 150m from the mobile plant used to engineer the NBBMA.

(ii) During the Piling, Site Preparation, PV installation and General Site activities in Cell 2, there would be an exceedance of the L_{Aeq} +3dB threshold at the closest approach in Cell 3 (the NBBMA), on a Saturday morning where works are undertaken within 120m of the eastern boundary of Cell 3.

(iii) During the Site Preparation, PV installation and General Site activities in Cell 2, there would be an exceedance of the average L_{Amax} dB threshold at the closest approach in Cell 3 (the NBBMA), on a Saturday morning and on weekdays where works are undertaken within 120m of the eastern boundary of Cell 3.

(iv) During Site Preparation and PV Installation in Cell 2, which are undertaken within 120m of the SSSI just north of Cell 2 and the eastern boundary of Cell 3 (the NBBMA) during a Saturday morning period of the L_{Aeq} +3dB threshold could be exceeded.

An Outline Construction Environmental Management Plan (CEMP) [APP-136] has been prepared, which describes the types of noise mitigation that are likely to be required/implemented, some examples of which are described below. Post-consent, this outline CEMP will be developed into a full CEMP which must be in substantial accordance with the outline CEMP and approved by the relevant planning authority. The Proposed Development must then be constructed in accordance with that approved full CEMP. This is secured by means of a Requirement in Schedule 2 of the draft DCO.

The possible range of measures that could be used to control noise during the construction period at NSR and NSER (and which would be confirmed in the detailed CEMP) are provided in section 5.3.21 of the ES NIA.

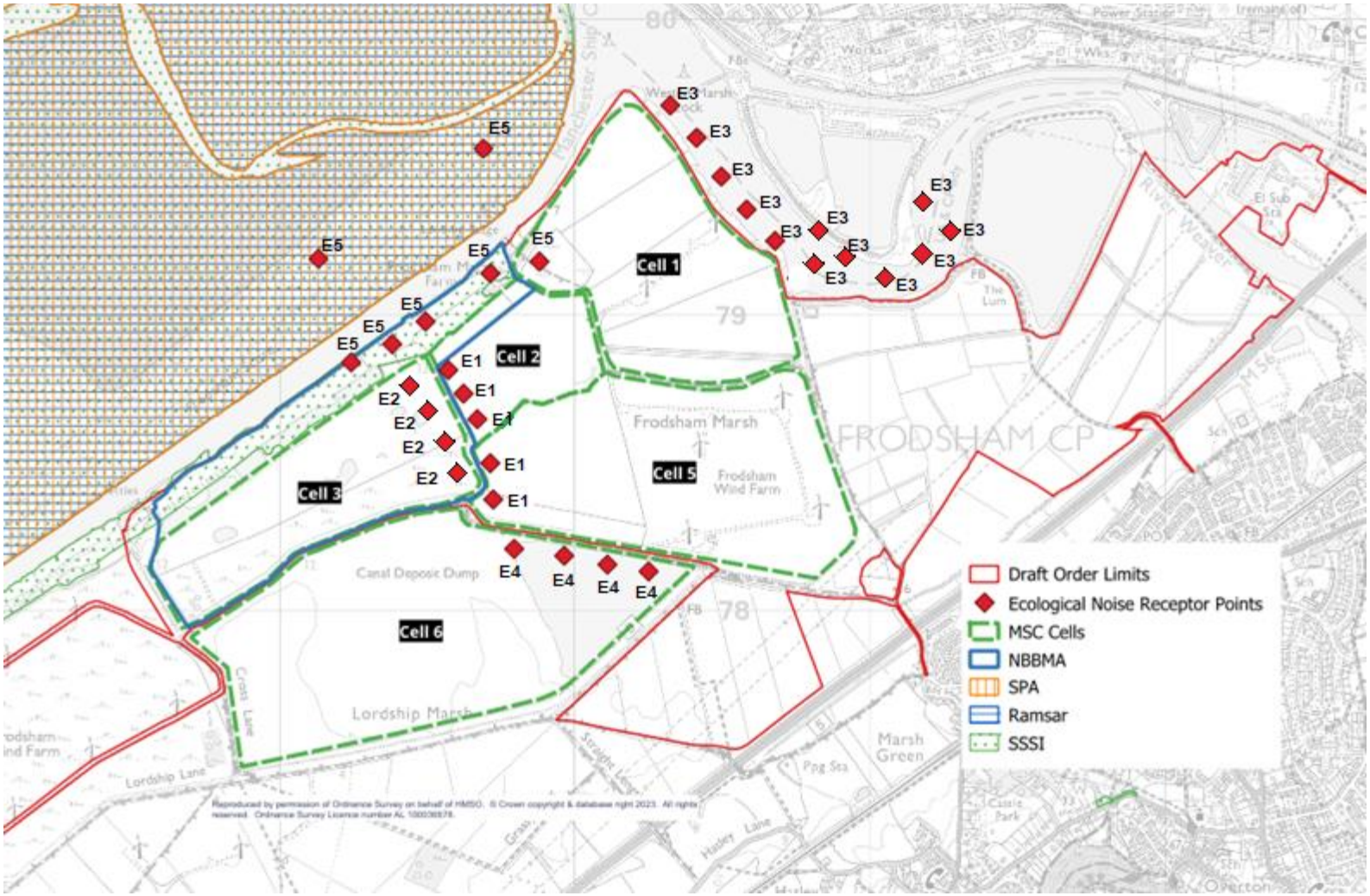
In respect of the option of introducing hoarding screens to reduce peak noise activities within the defined separation distances advised in i) to iv) above, the precise specification of the hoarding screens would need to be defined once the detailed plant schedule and phased working is known. This is entirely normal at this point in the development process but there are substantial range of acoustic screening technologies which could be applied to achieve the required noise reduction. The screen length, height and design of any screen and its location (for optimum attenuation) would need to be defined together with any input from the monitoring of plant noise as the works are undertaken.

D R Kettlewell MSc MIOA MAE I.Eng
Managing Director
Principal Acoustic Consultant

Figure 1: Baseline Noise Measurement Locations (NSER)



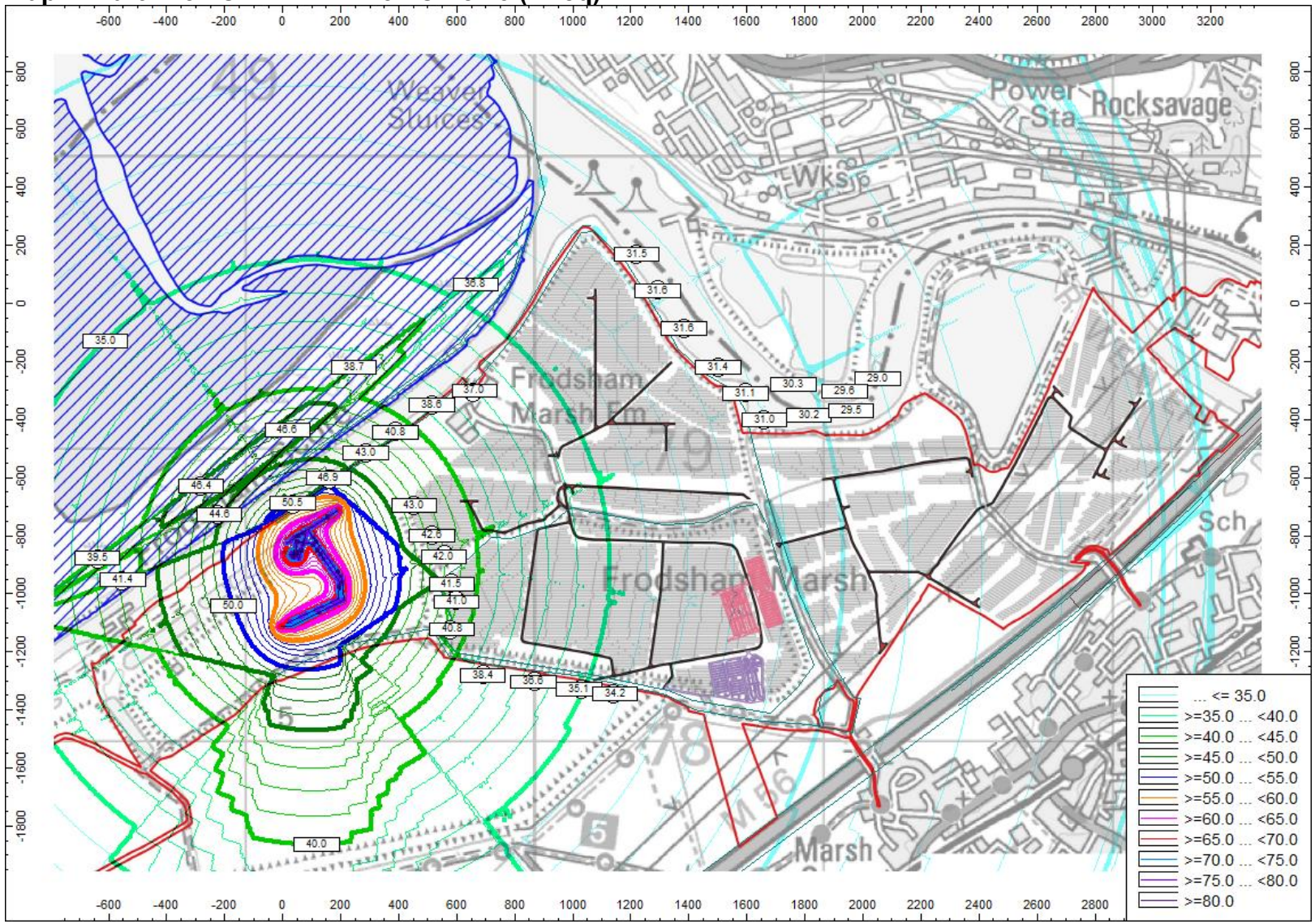
Figure 2: Ecological Sensitive Receptor Areas



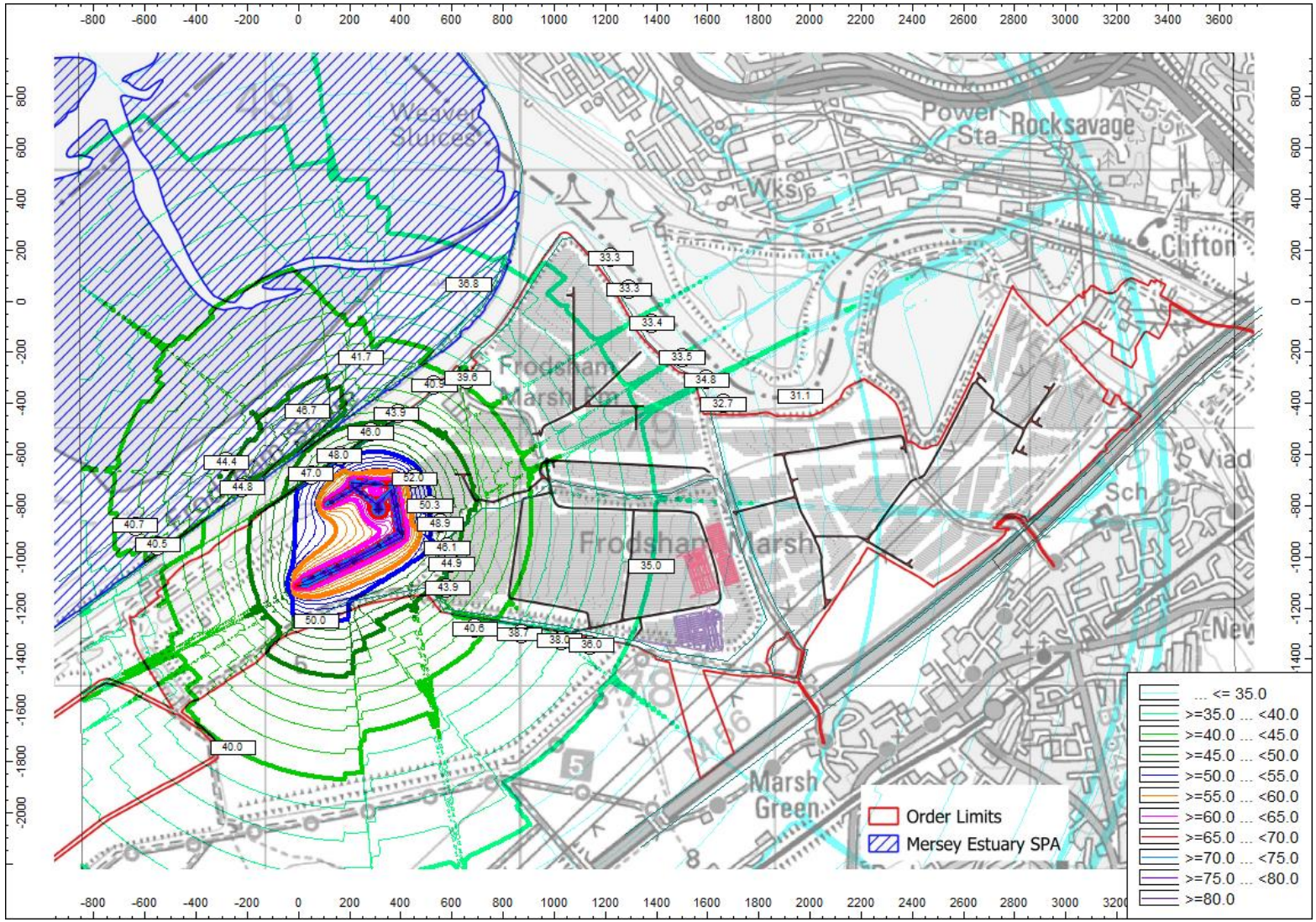
Appendix 1

Construction Noise Contours: Nearest Sensitive Ecological Receptors (LAeq)

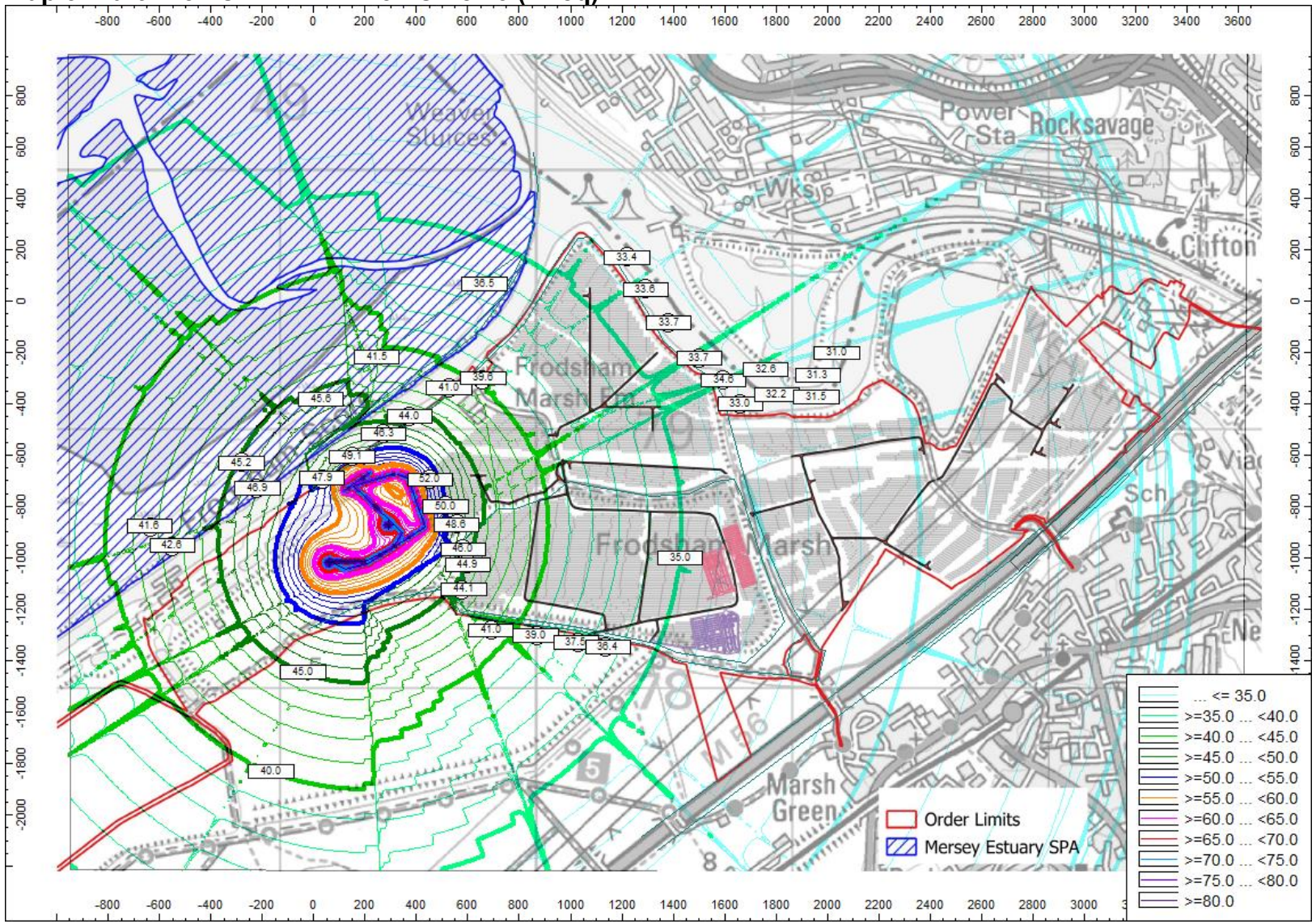
Map 1: Earthworks: NBBMA Works Cell 3 (LAeq)



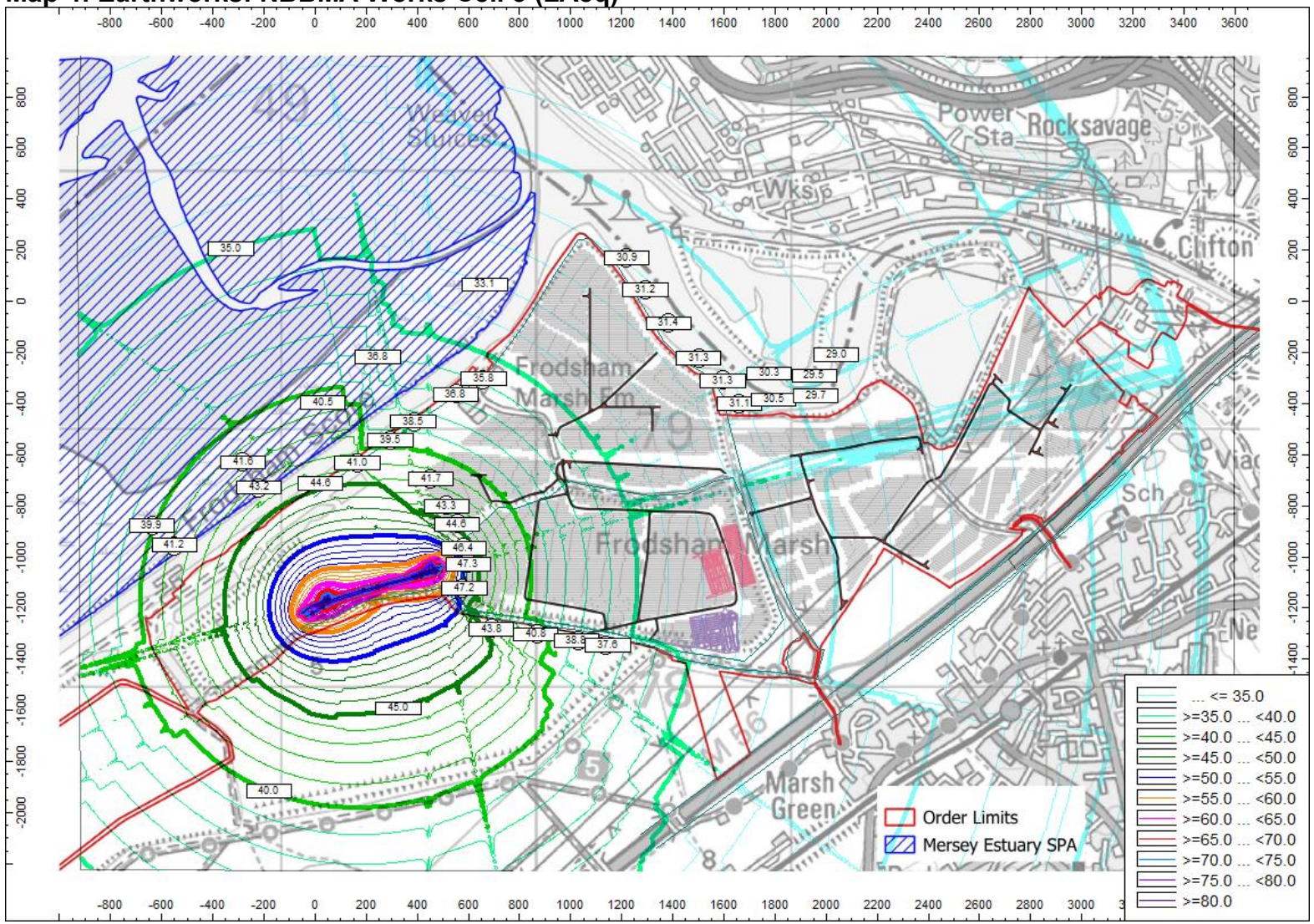
Map 2: Earthworks: NBBMA Works Cell 3 (LAeq)



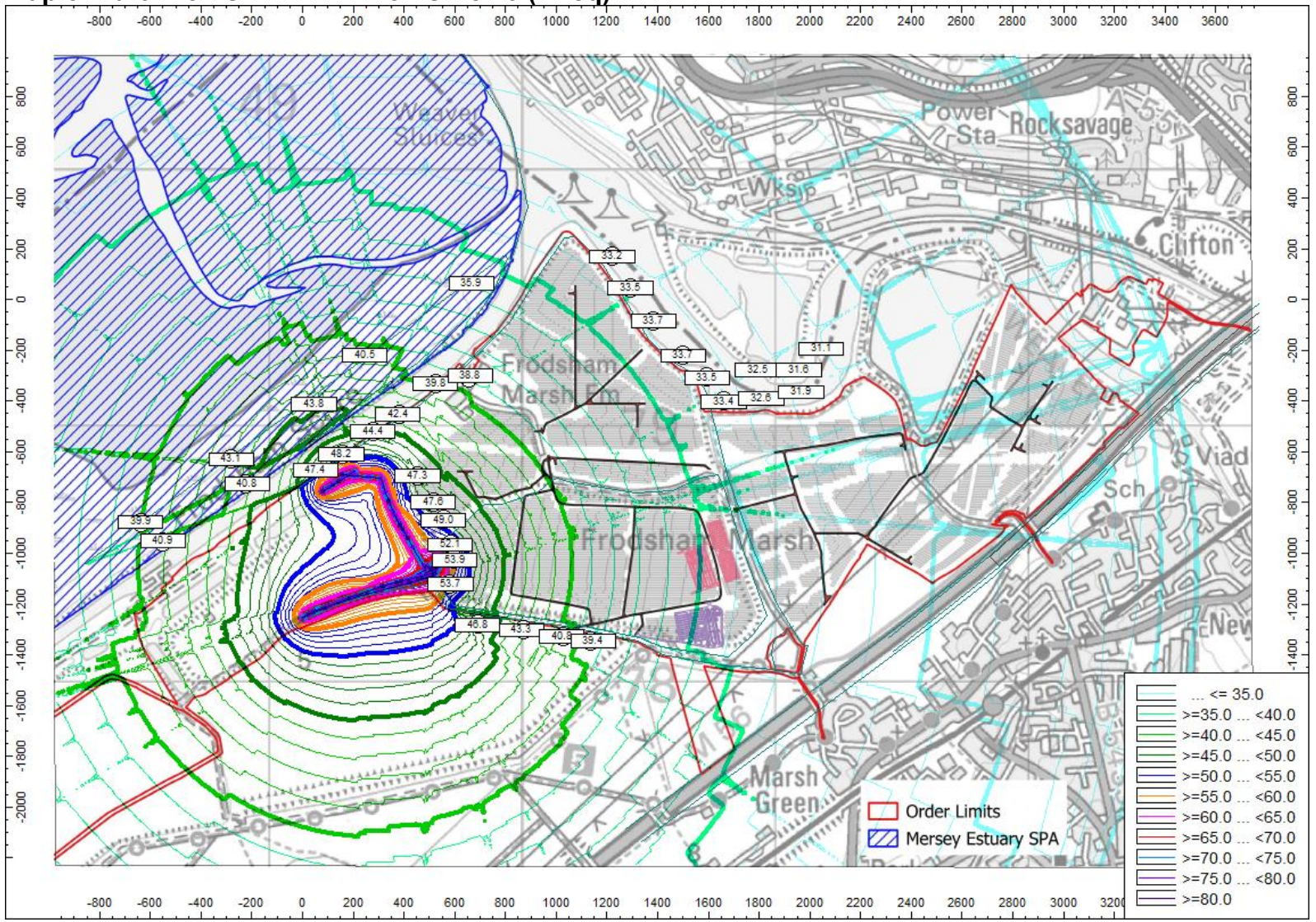
Map 3: Earthworks: NBBMA Works Cell 3 (LAeq)



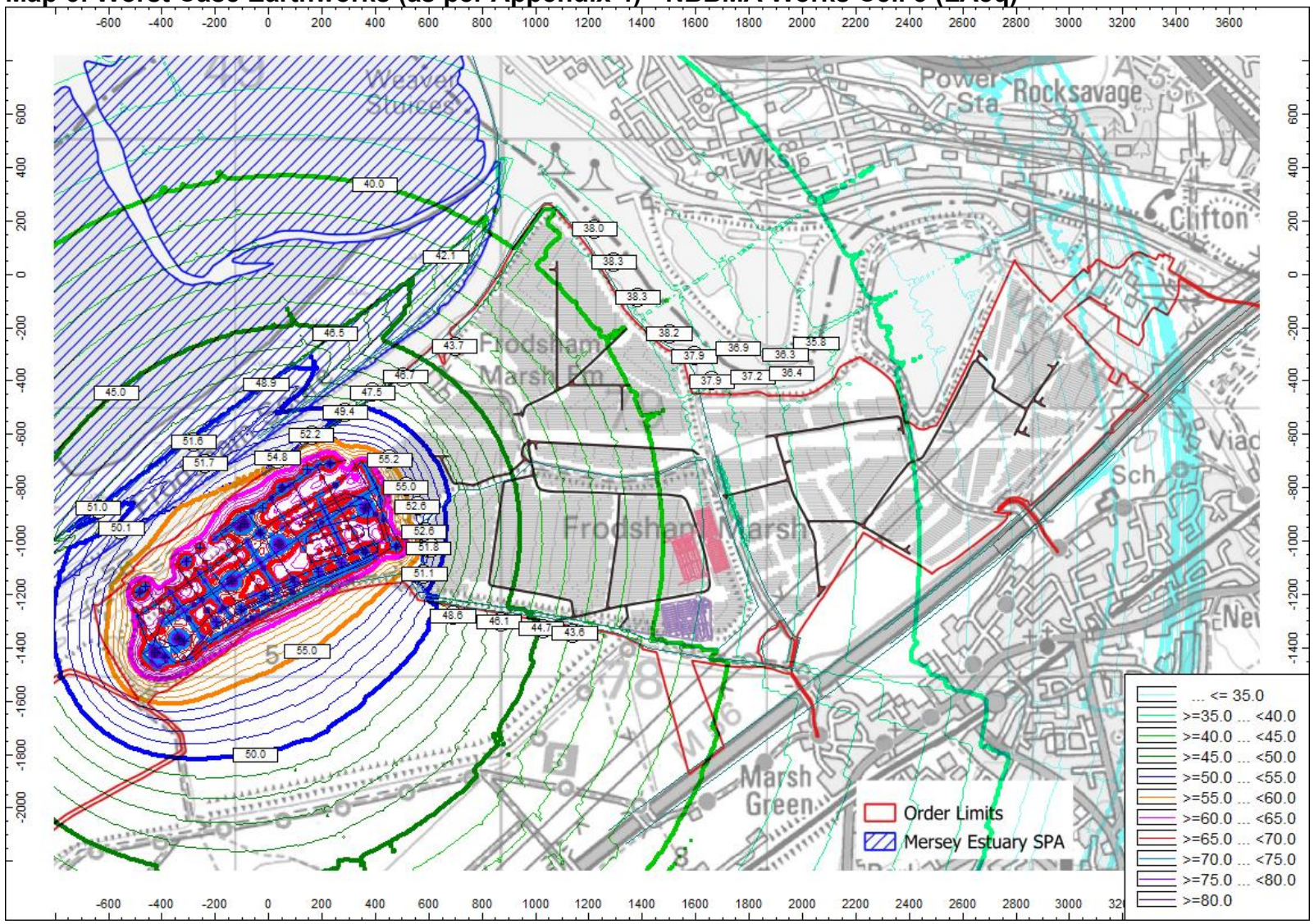
Map 4: Earthworks: NBBMA Works Cell 3 (LAeq)



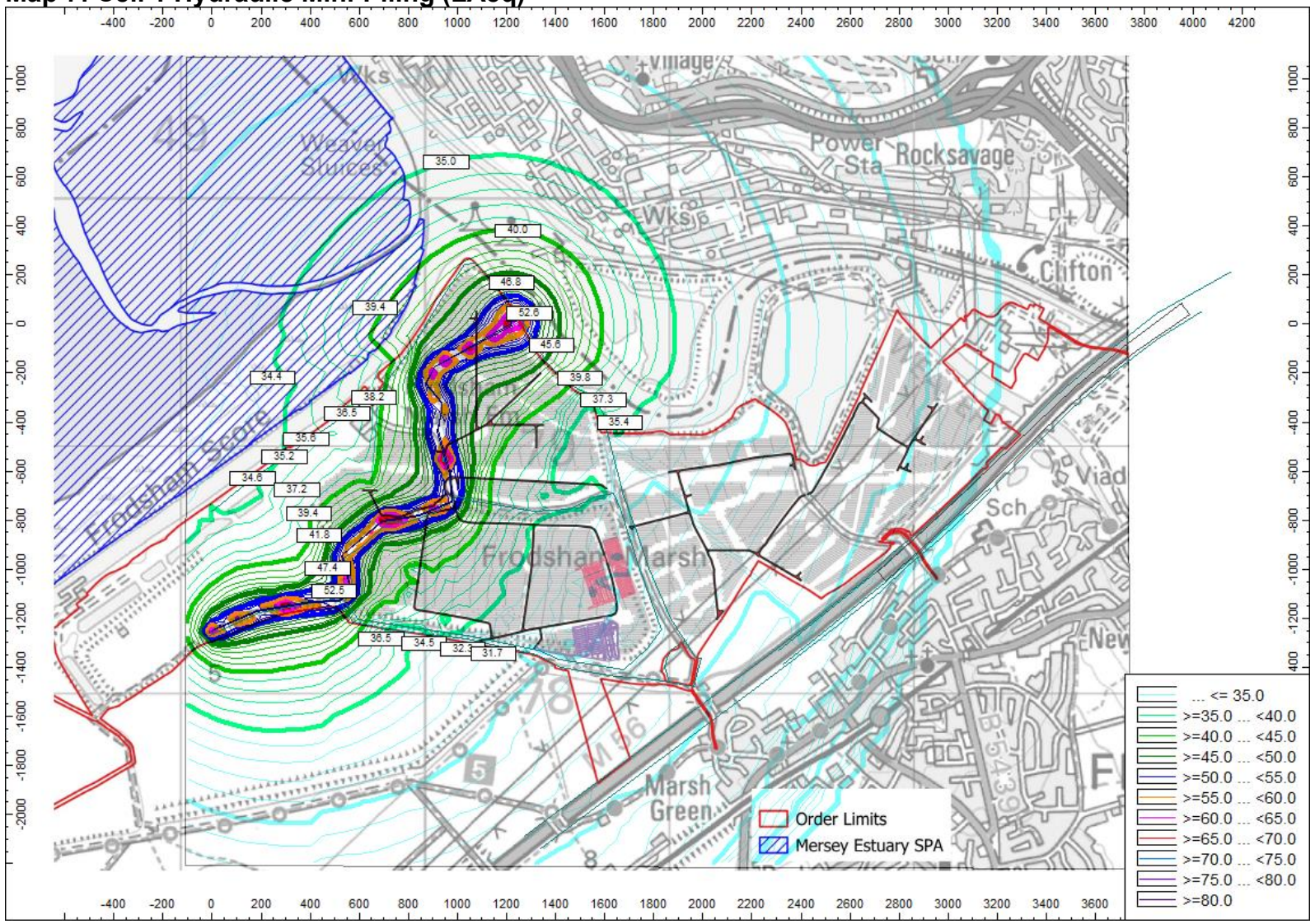
Map 5: Earthworks: NBBMA Works Cell 3 (LAeq)



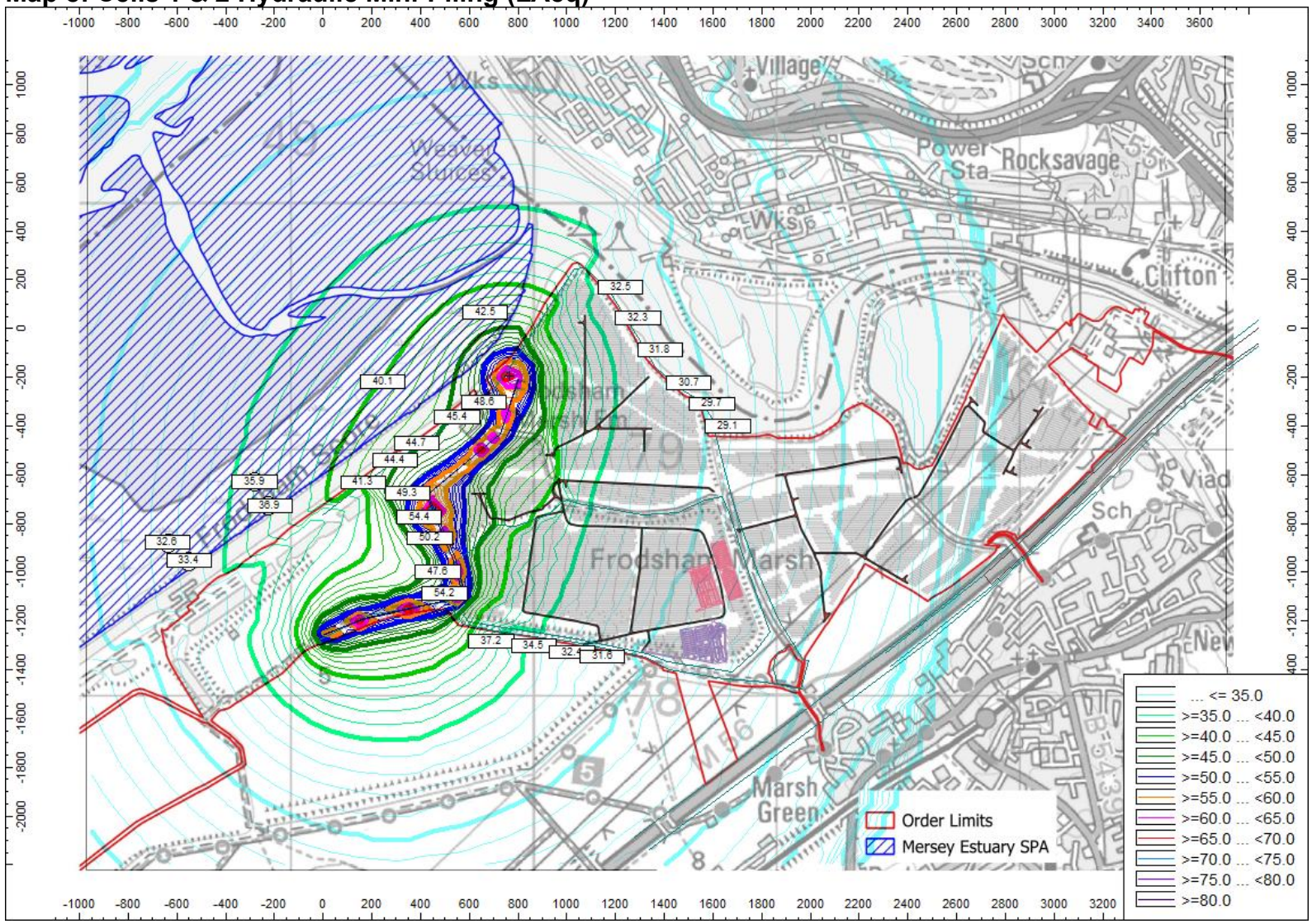
Map 6: Worst Case Earthworks (as per Appendix 4) - NBBMA Works Cell 3 (LAeq)



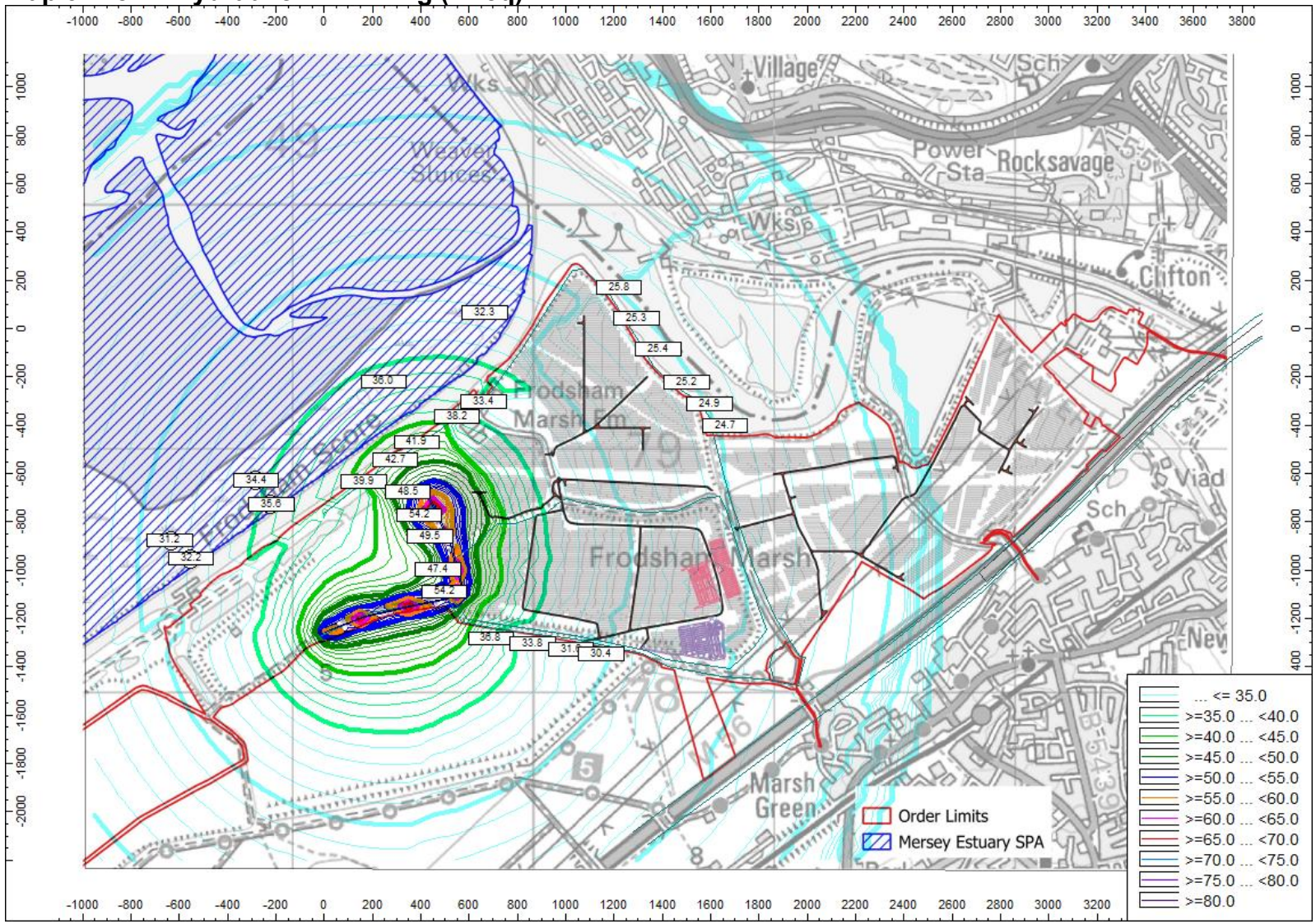
Map 7: Cell 1 Hydraulic Mini-Piling (LAeq)



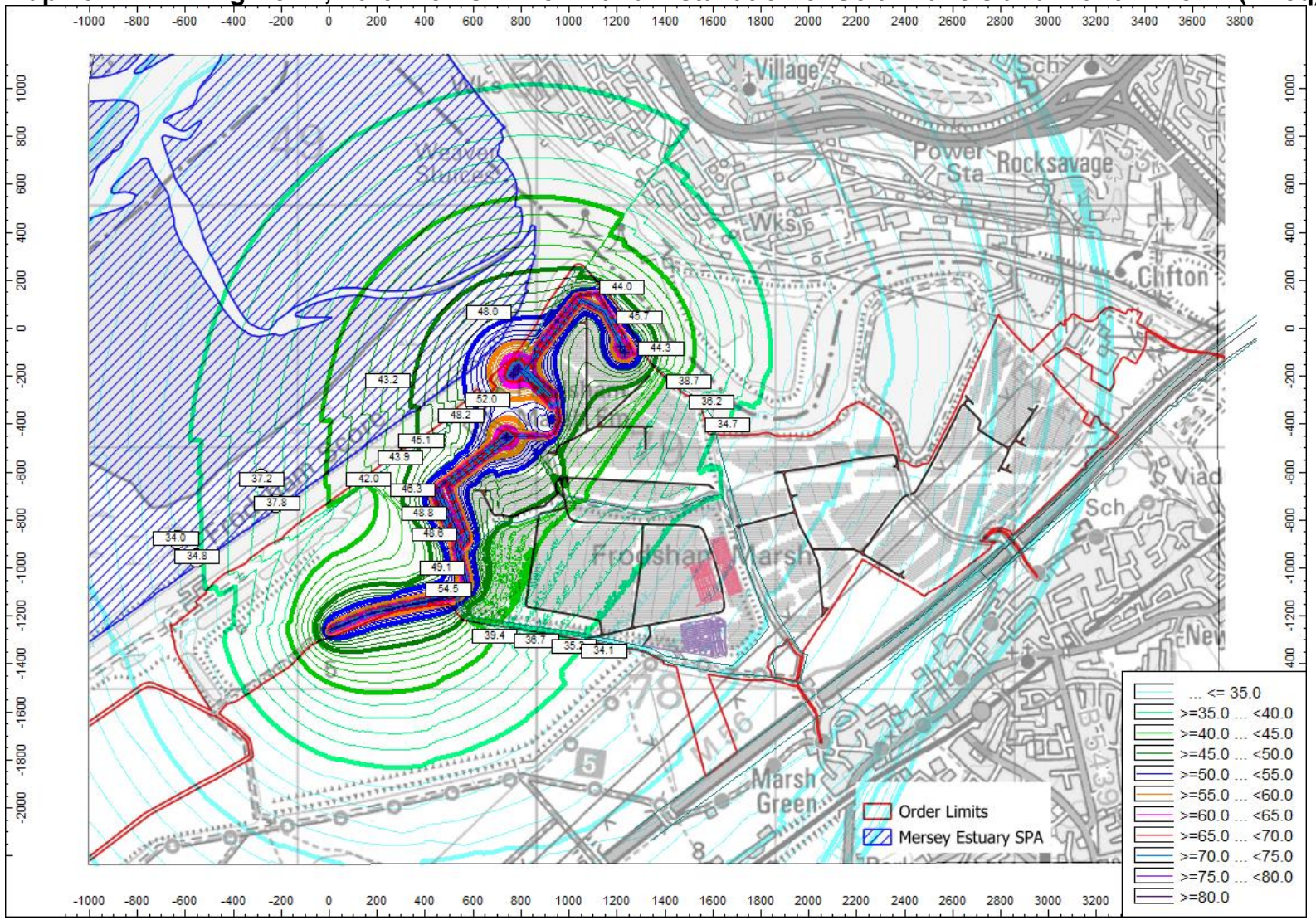
Map 8: Cells 1 & 2 Hydraulic Mini-Piling (LAeq)



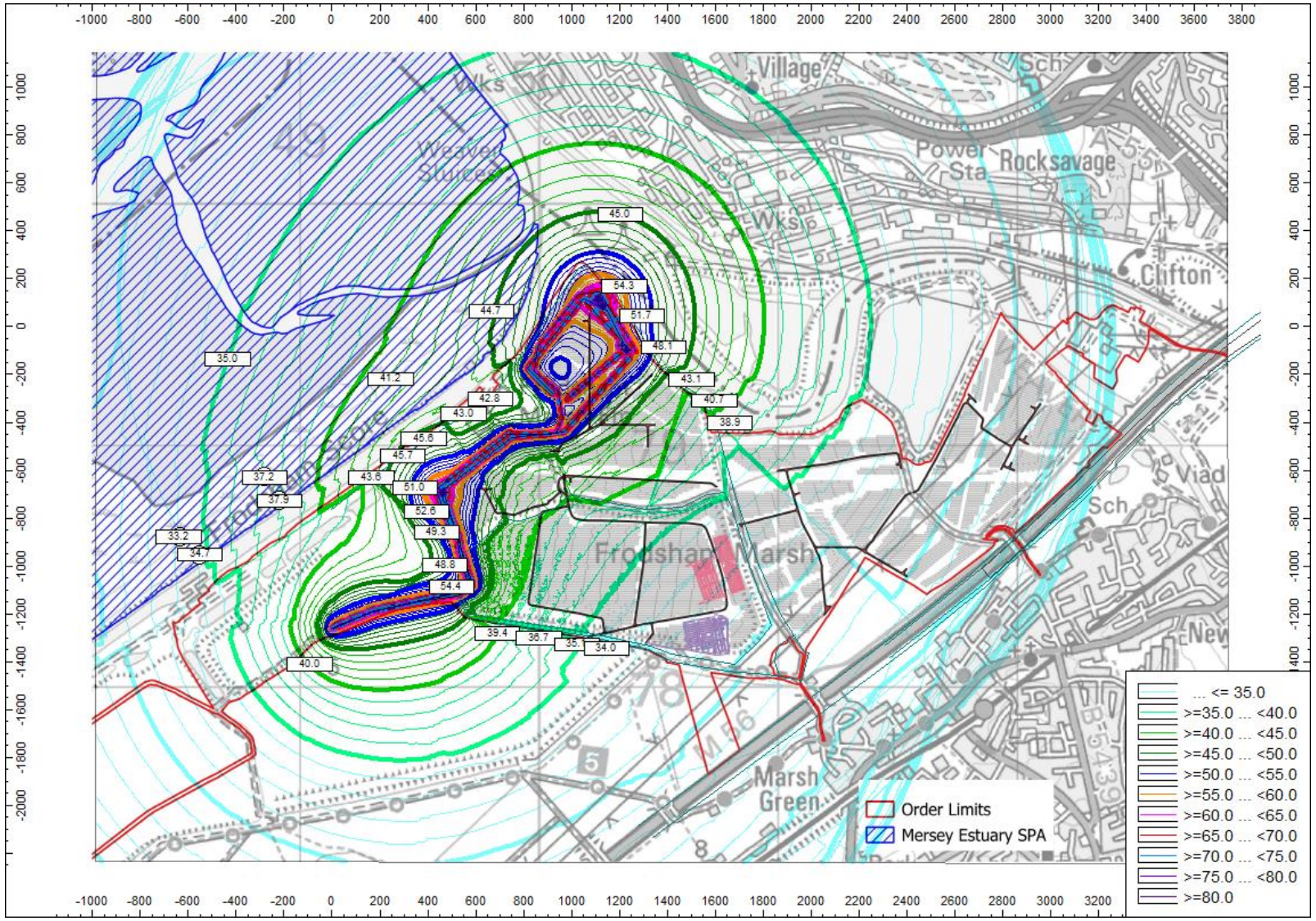
Map 9: Cell 2 Hydraulic Mini Piling (LAeq)



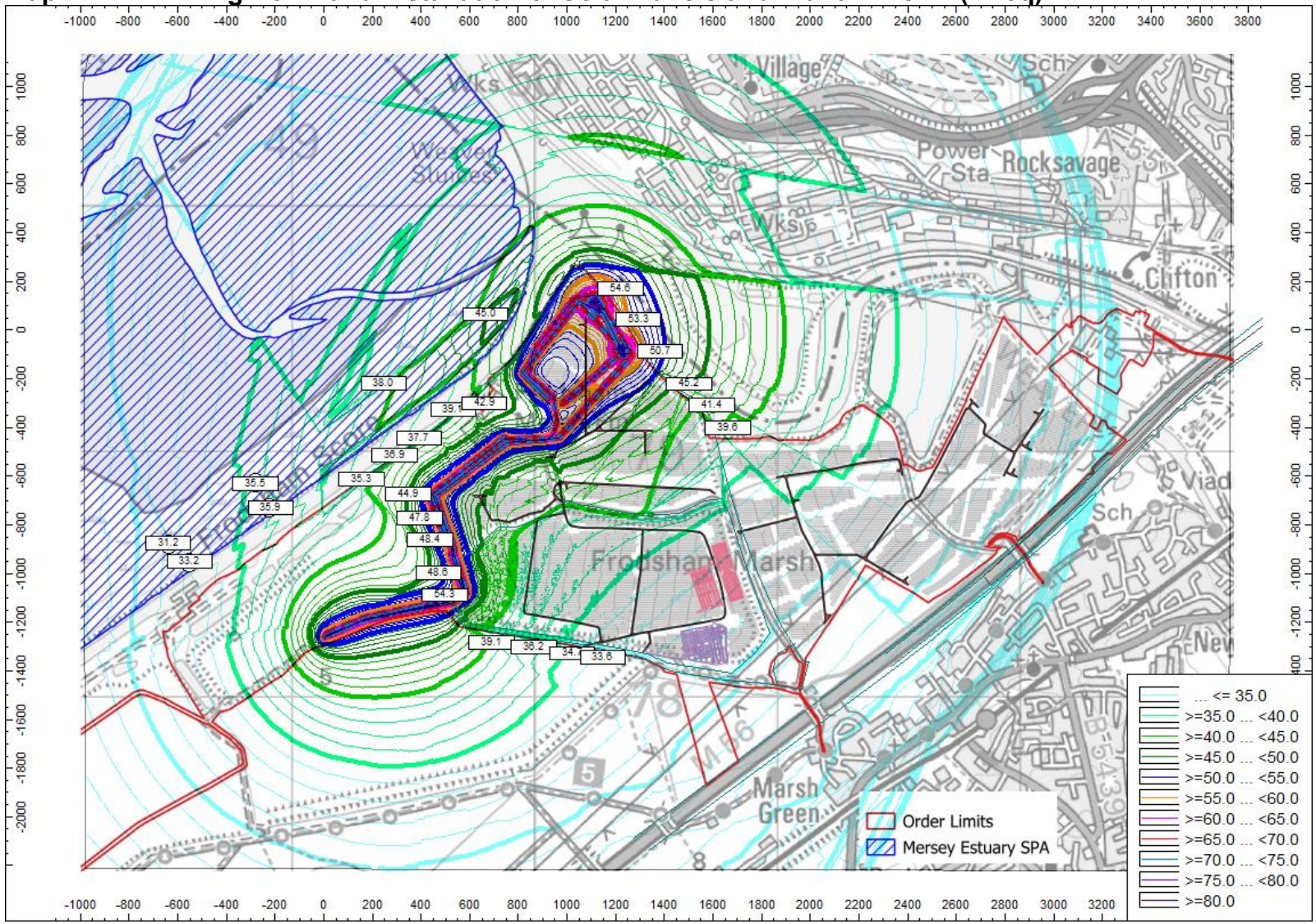
Map 10: Mini-Piling Cell 1, Earthworks in Cell 2 and Installation of Solar Panels and Plant in Cell 1 (LAeq)



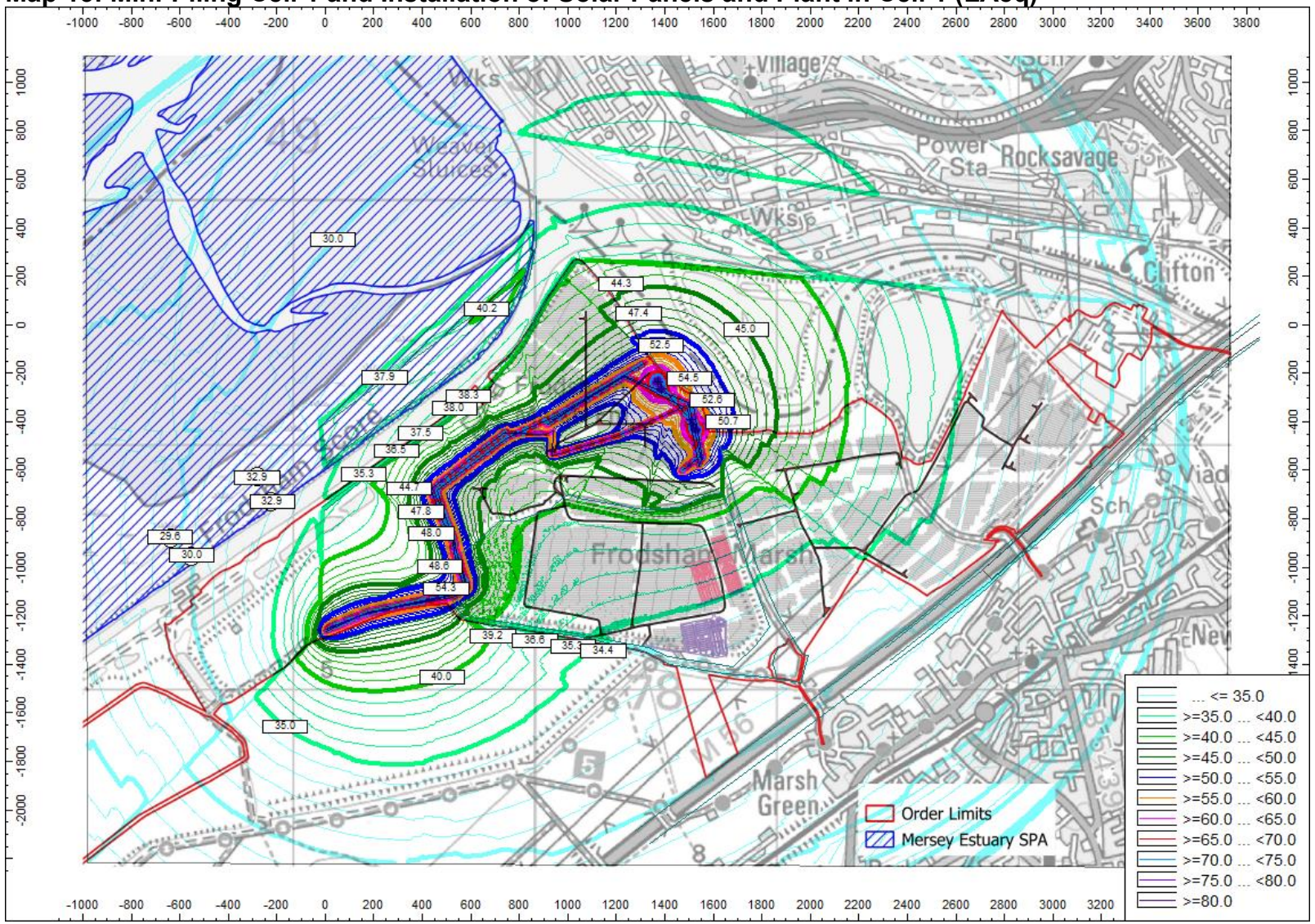
Map 11: Mini-Piling Cell 1, Earthworks in Cell 2 and Installation of Solar Panels and Plant in Cell 1 (LAeq)



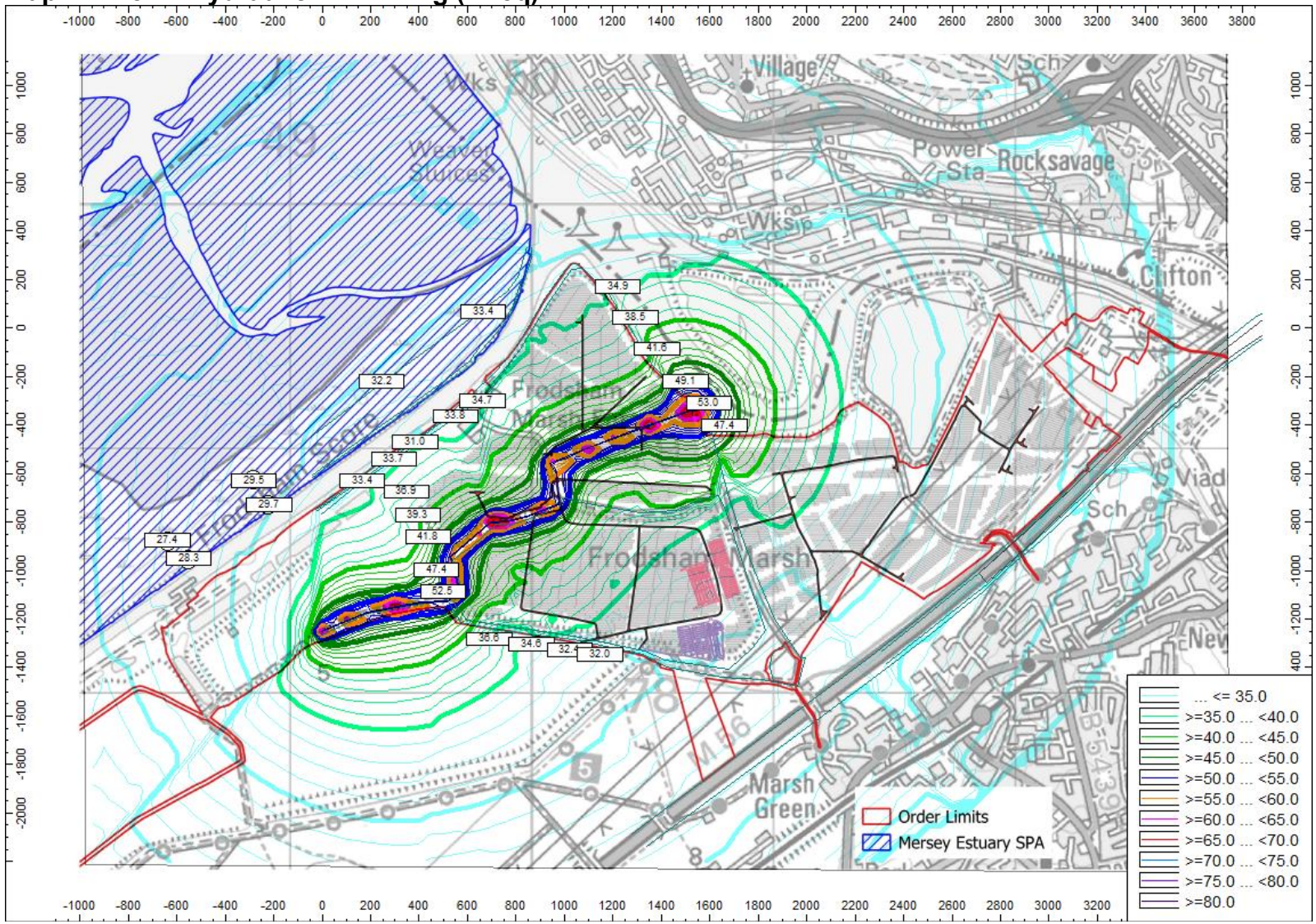
Map 12: Mini-Piling Cell 1 and Installation of Solar Panels and Plant in Cell 1 (LAeq)



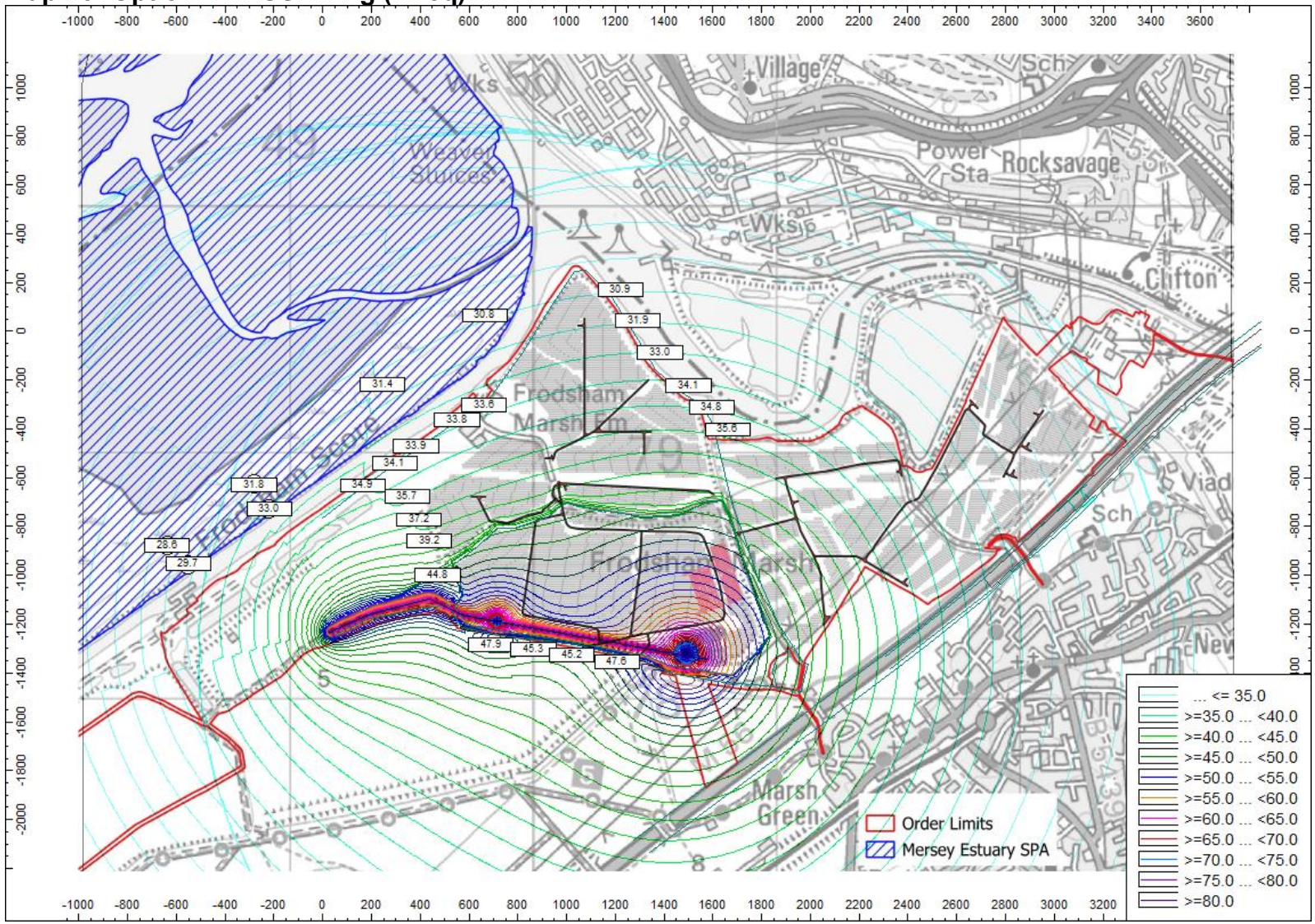
Map 13: Mini-Piling Cell 1 and Installation of Solar Panels and Plant in Cell 1 (LAeq)



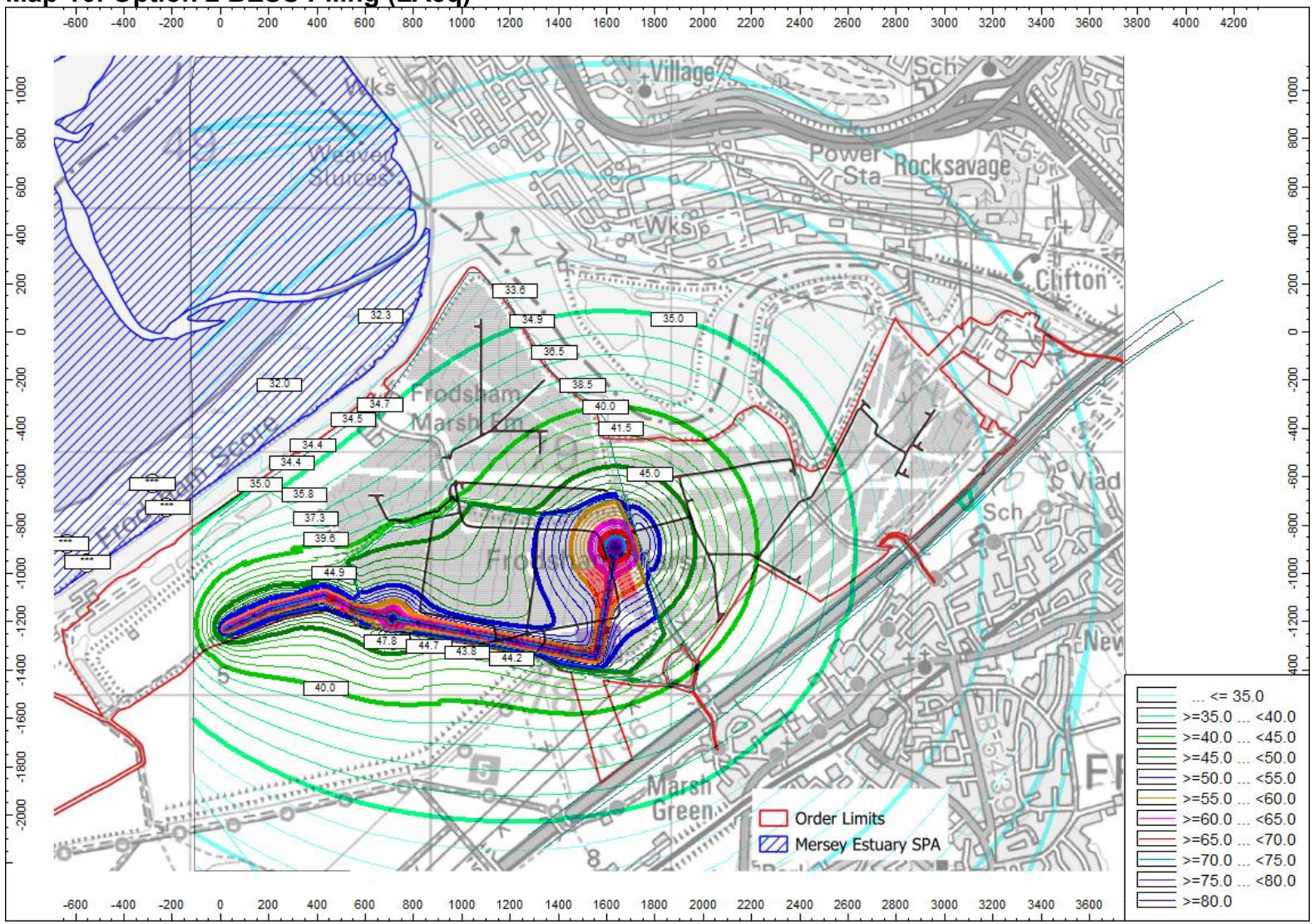
Map 14: Cell 1 Hydraulic Mini-Piling (LAeq)



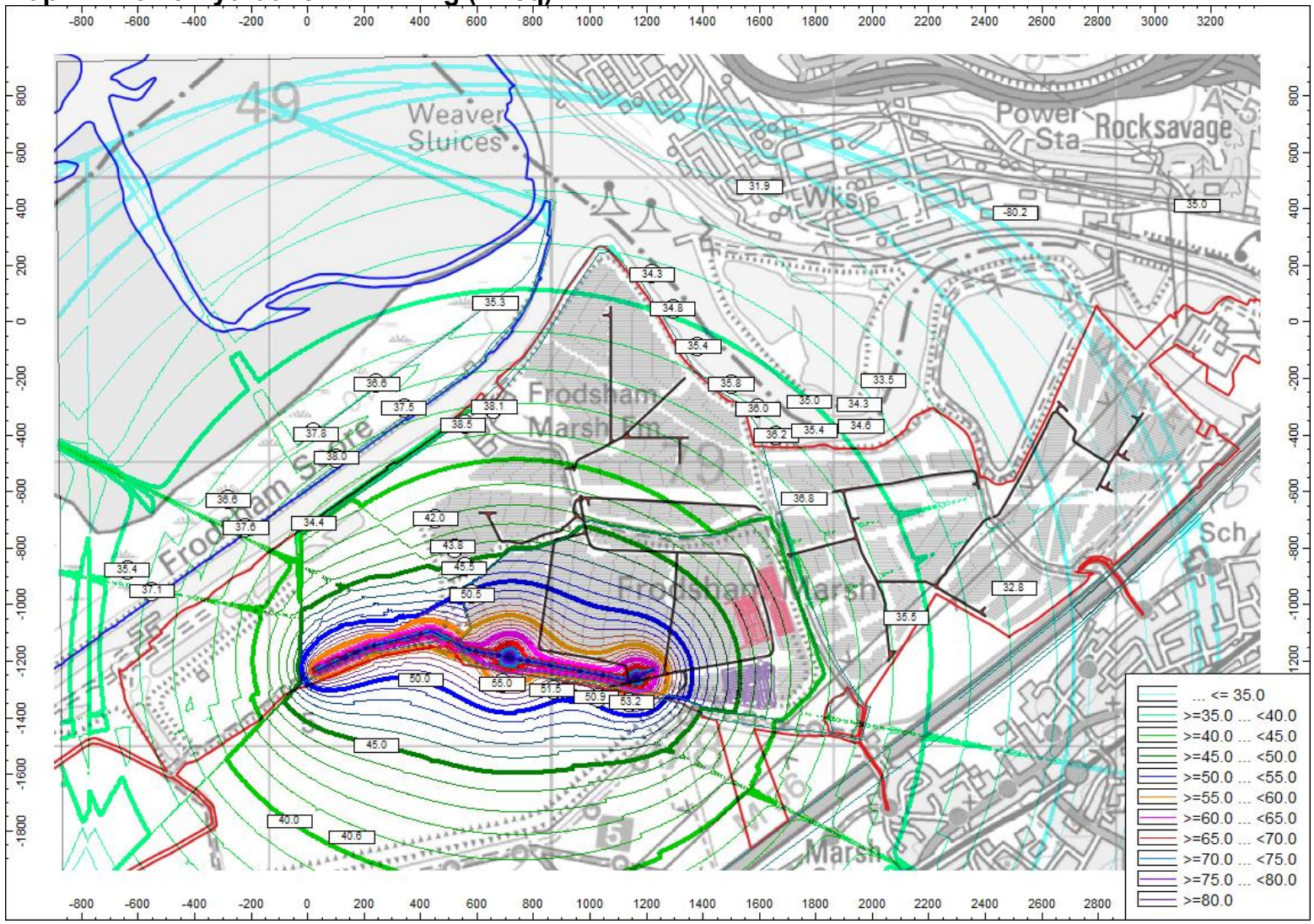
Map 15: Option 1 BESS Piling (LAeq)



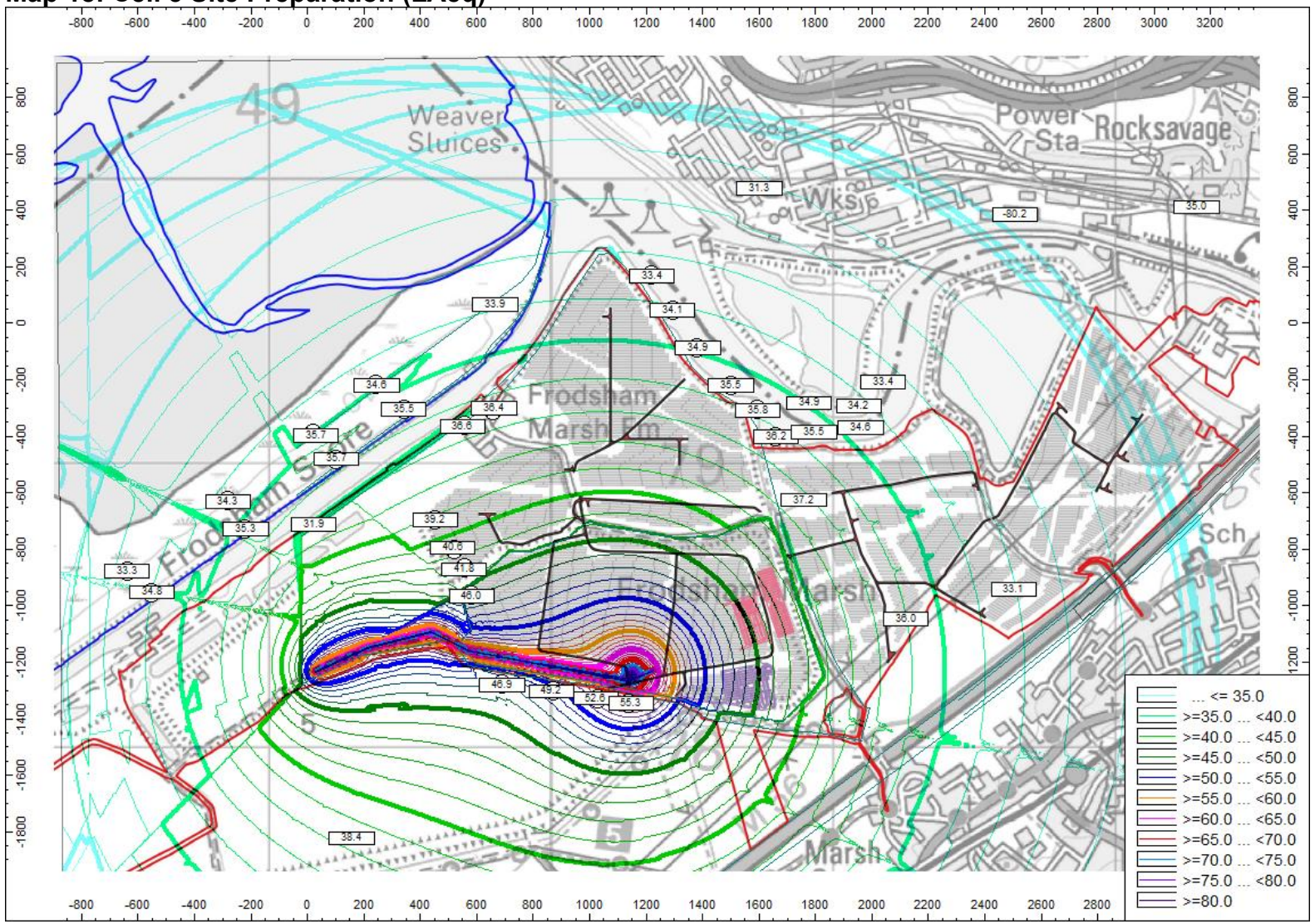
Map 16: Option 2 BESS Piling (LAeq)



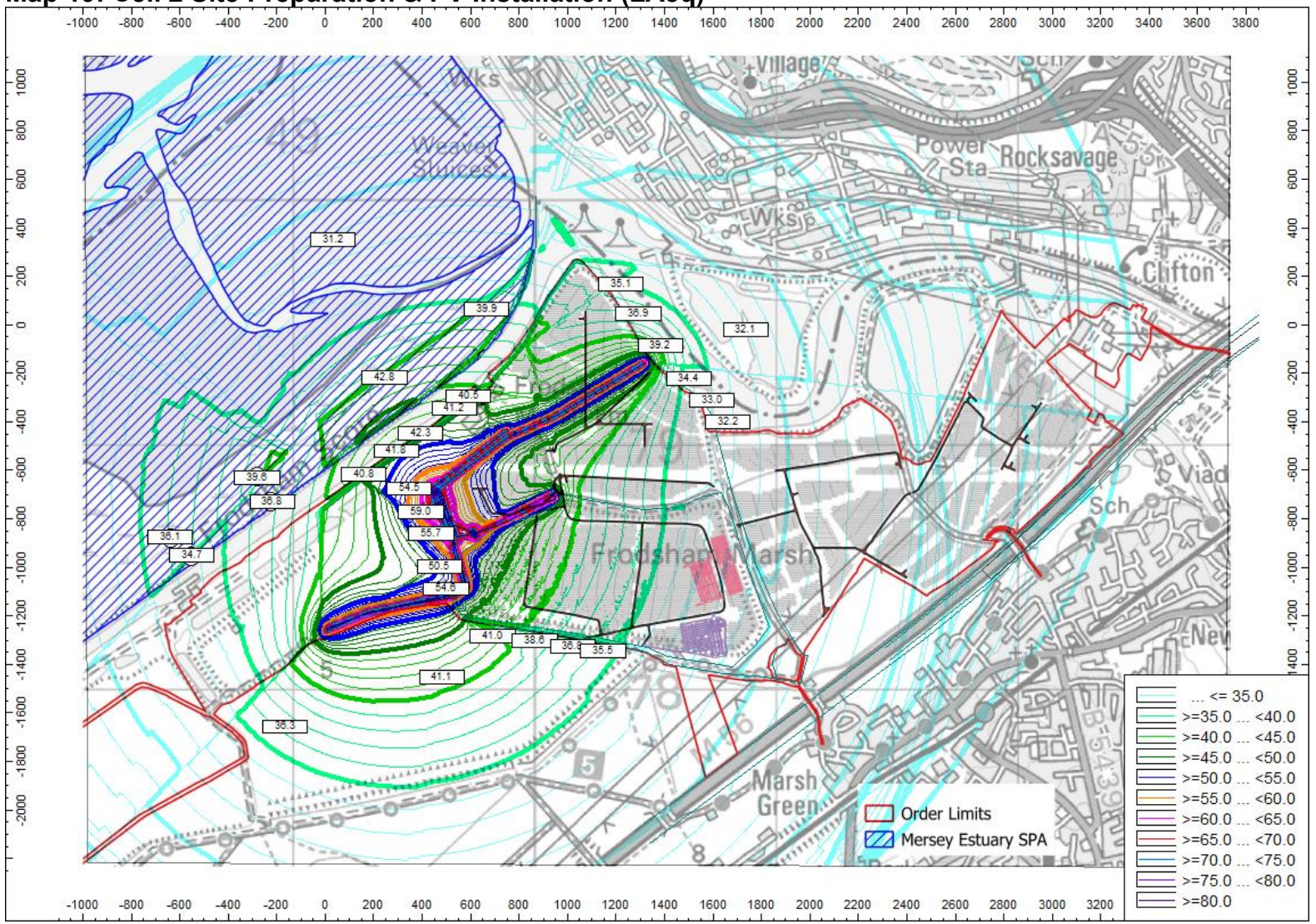
Map 17: Cell 5 Hydraulic Mini-Piling (LAeq)



Map 18: Cell 5 Site Preparation (LAeq)



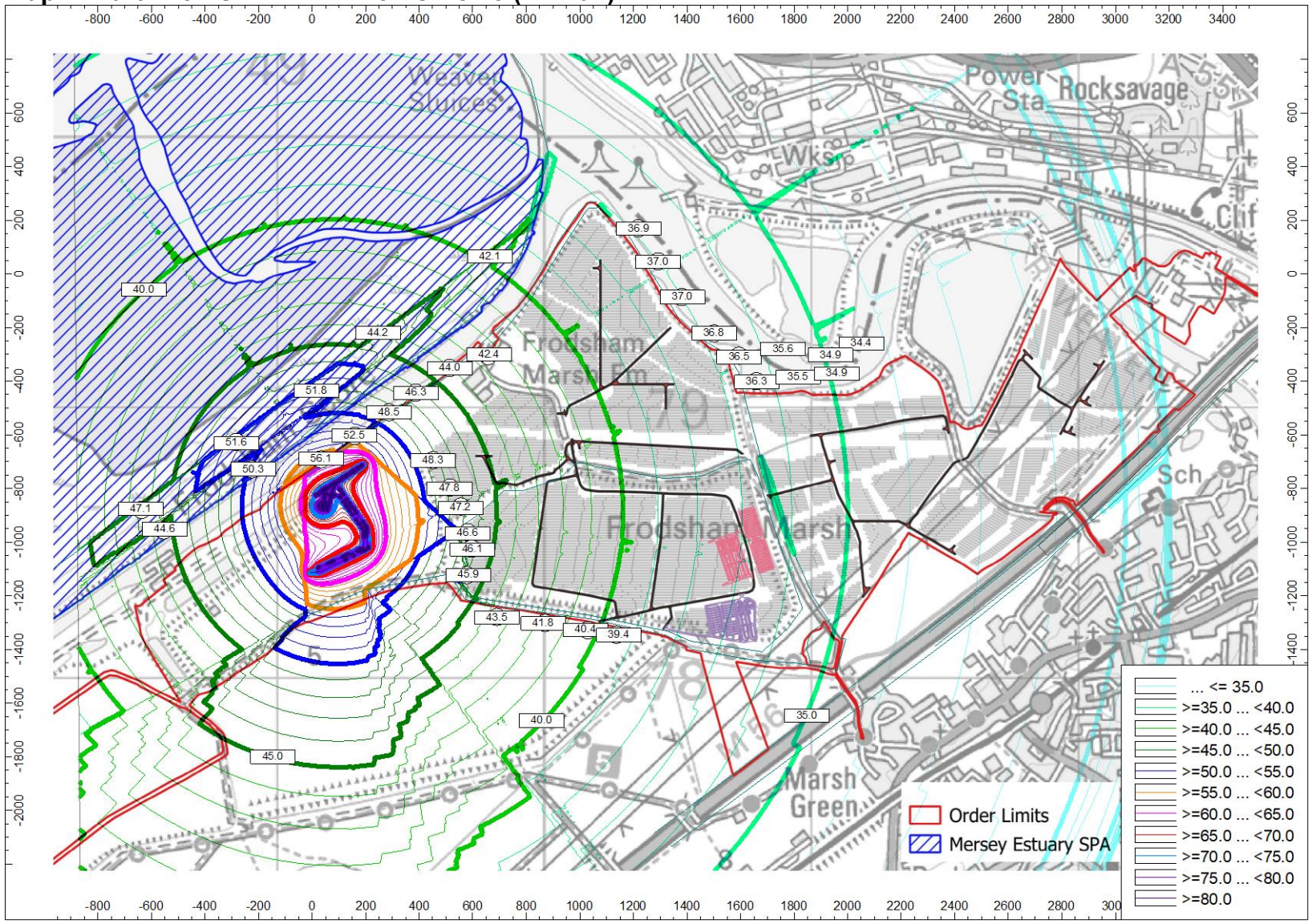
Map 19: Cell 2 Site Preparation & PV Installation (LAeq)



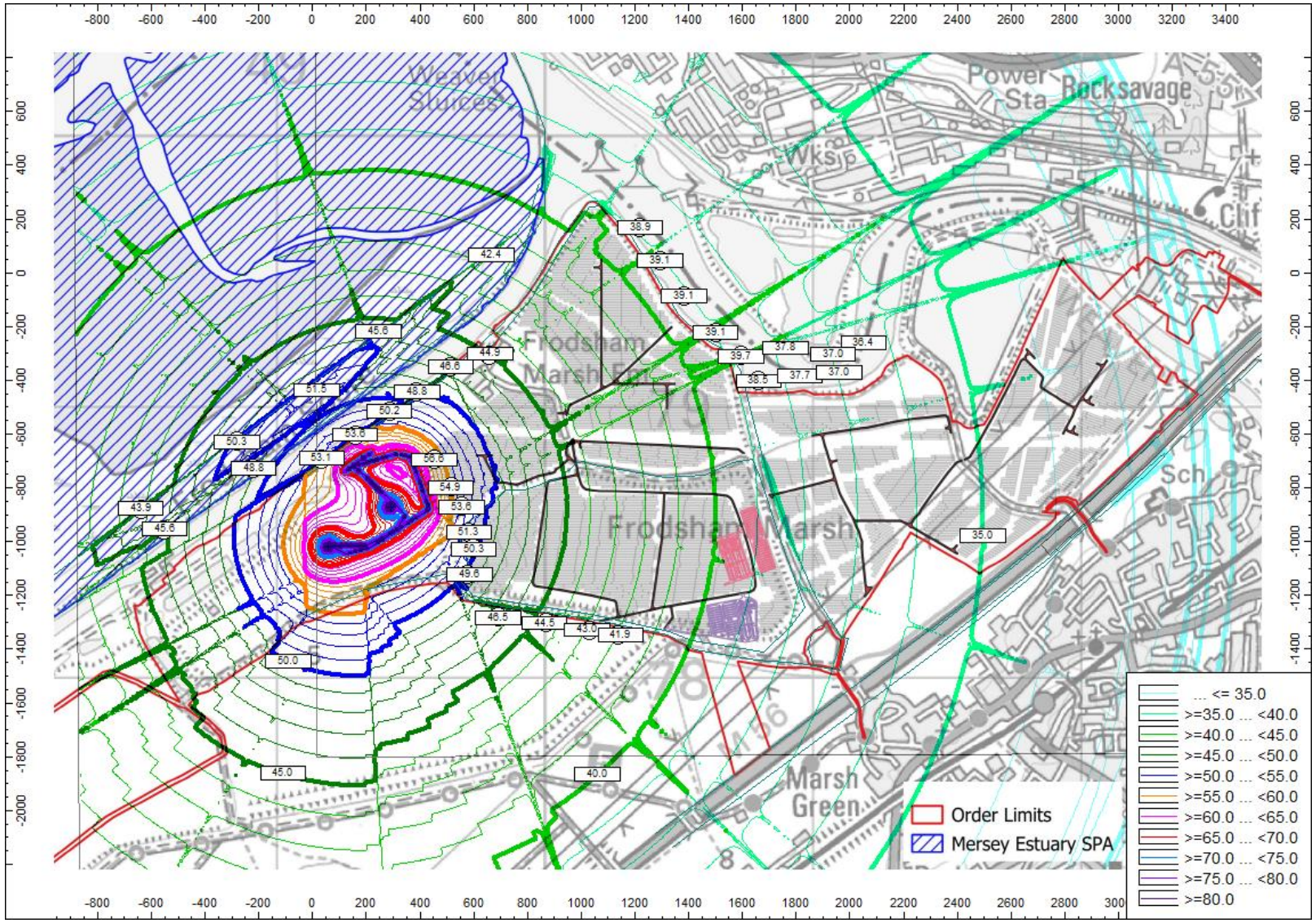
Appendix 2

Construction Noise Contours: Nearest Sensitive Ecological Receptors (LAmax)

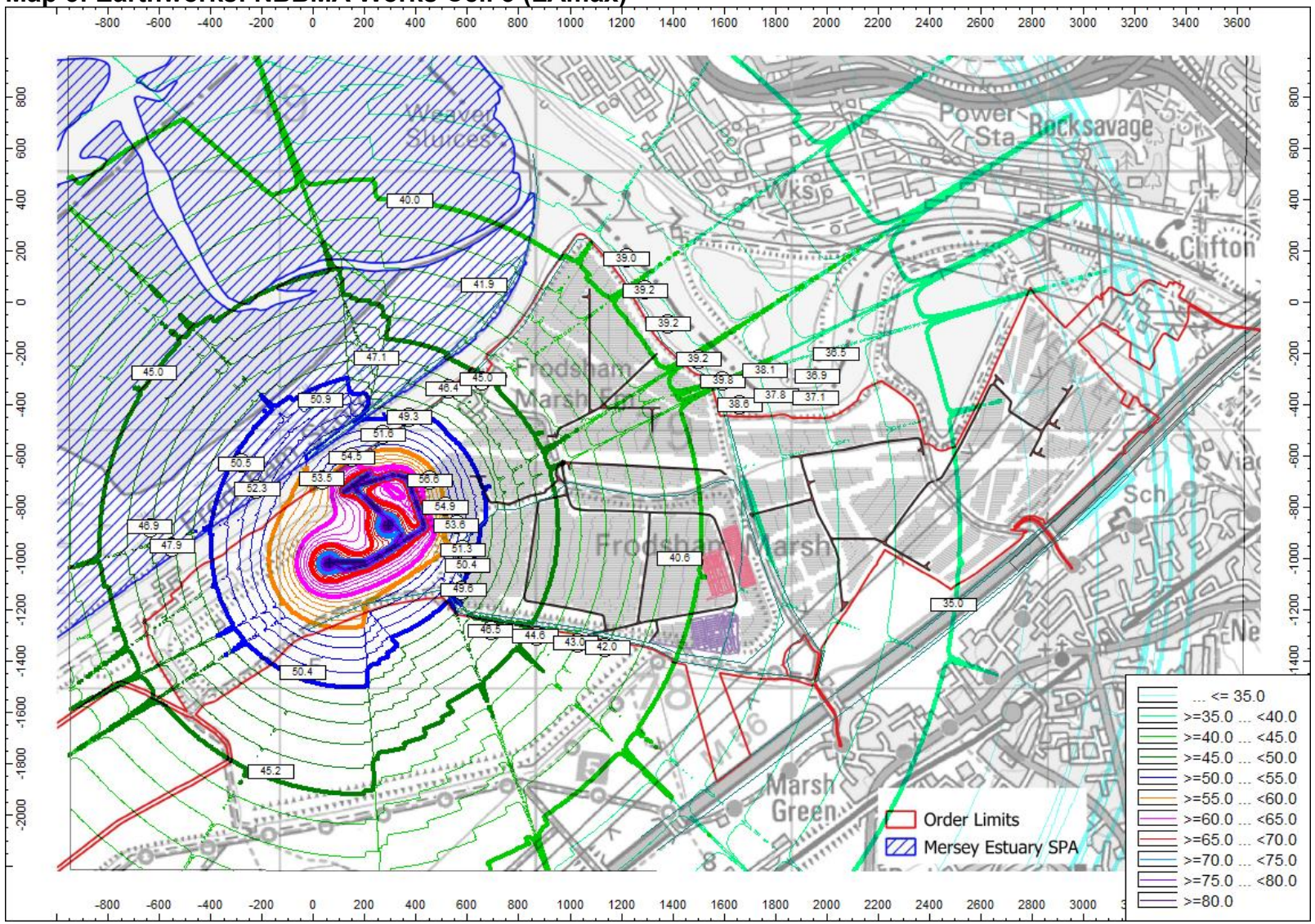
Map 1: Earthworks: NBBMA Works Cell 3 (LAmax)



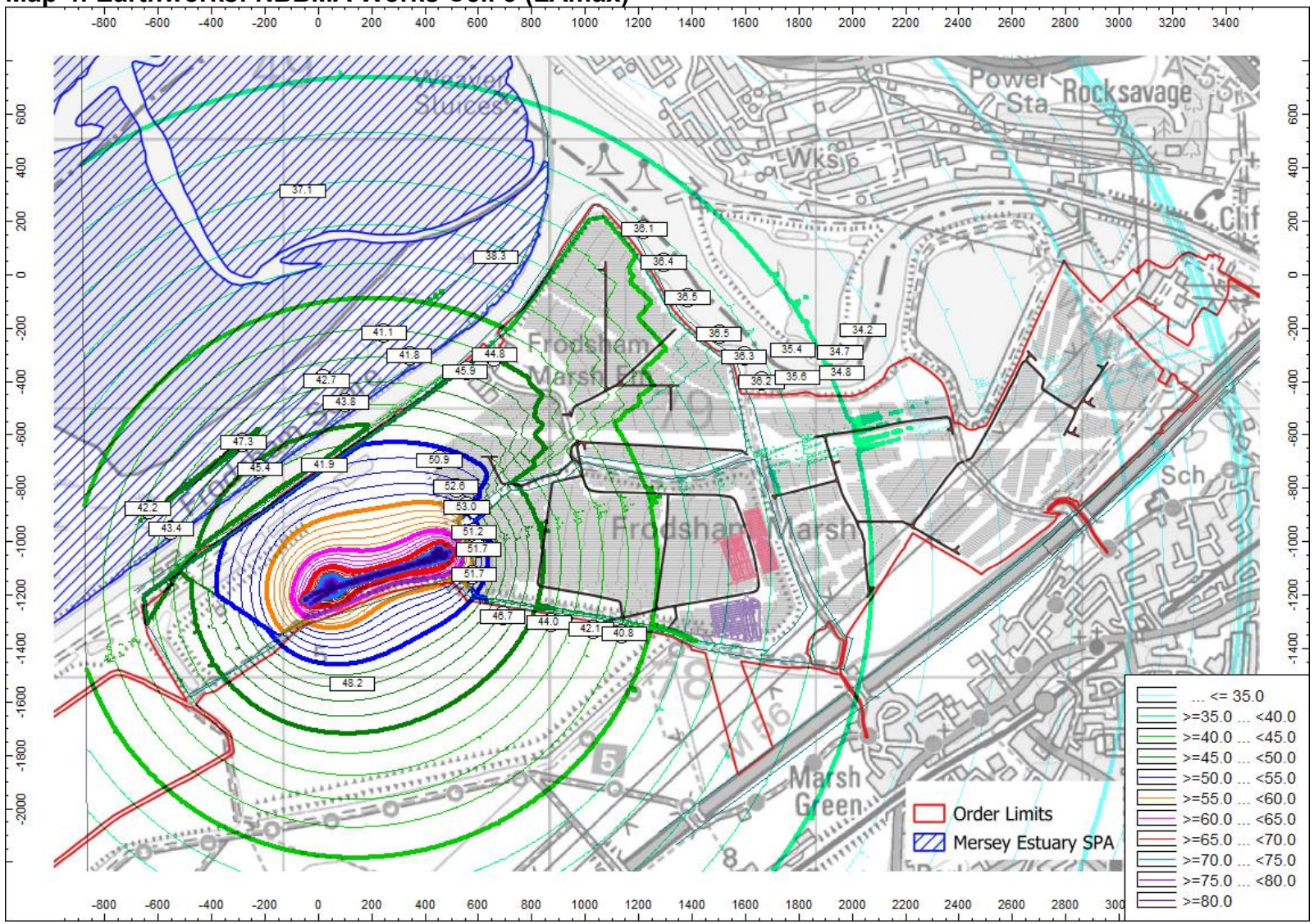
Map 2: Earthworks: NBBMA Works Cell 3 (LAmax)



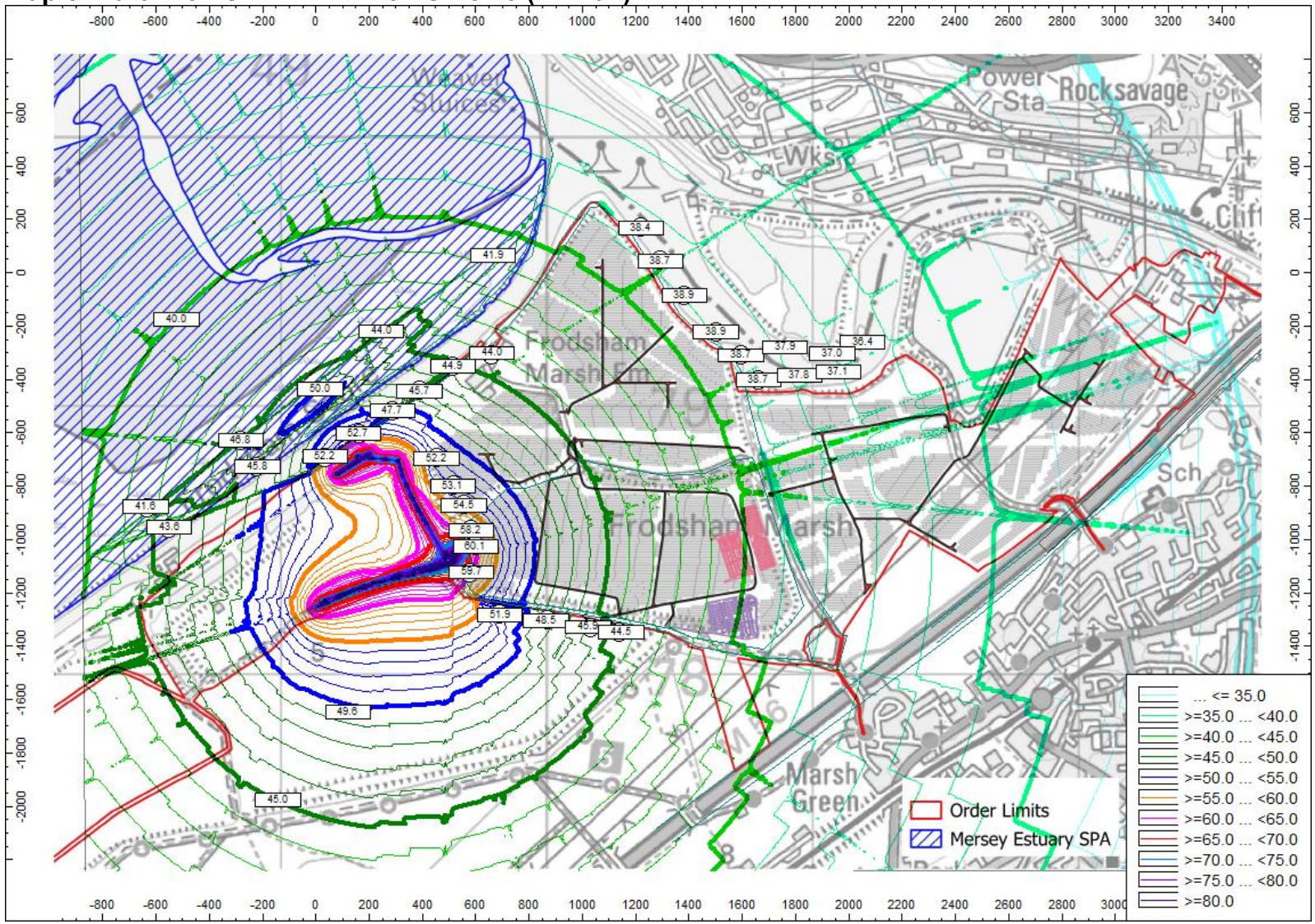
Map 3: Earthworks: NBBMA Works Cell 3 (LAmax)



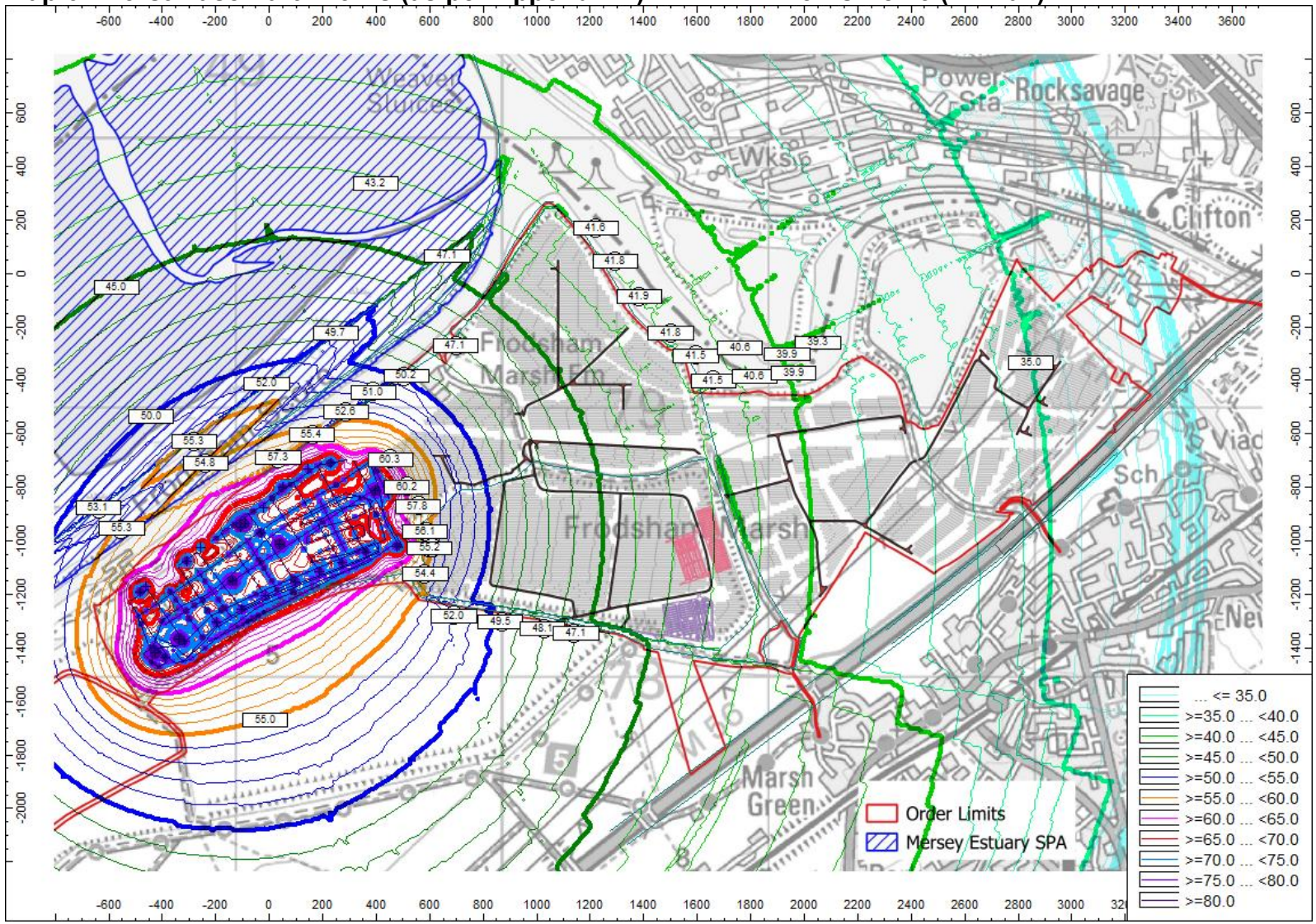
Map 4: Earthworks: NBBMA Works Cell 3 (LAmax)



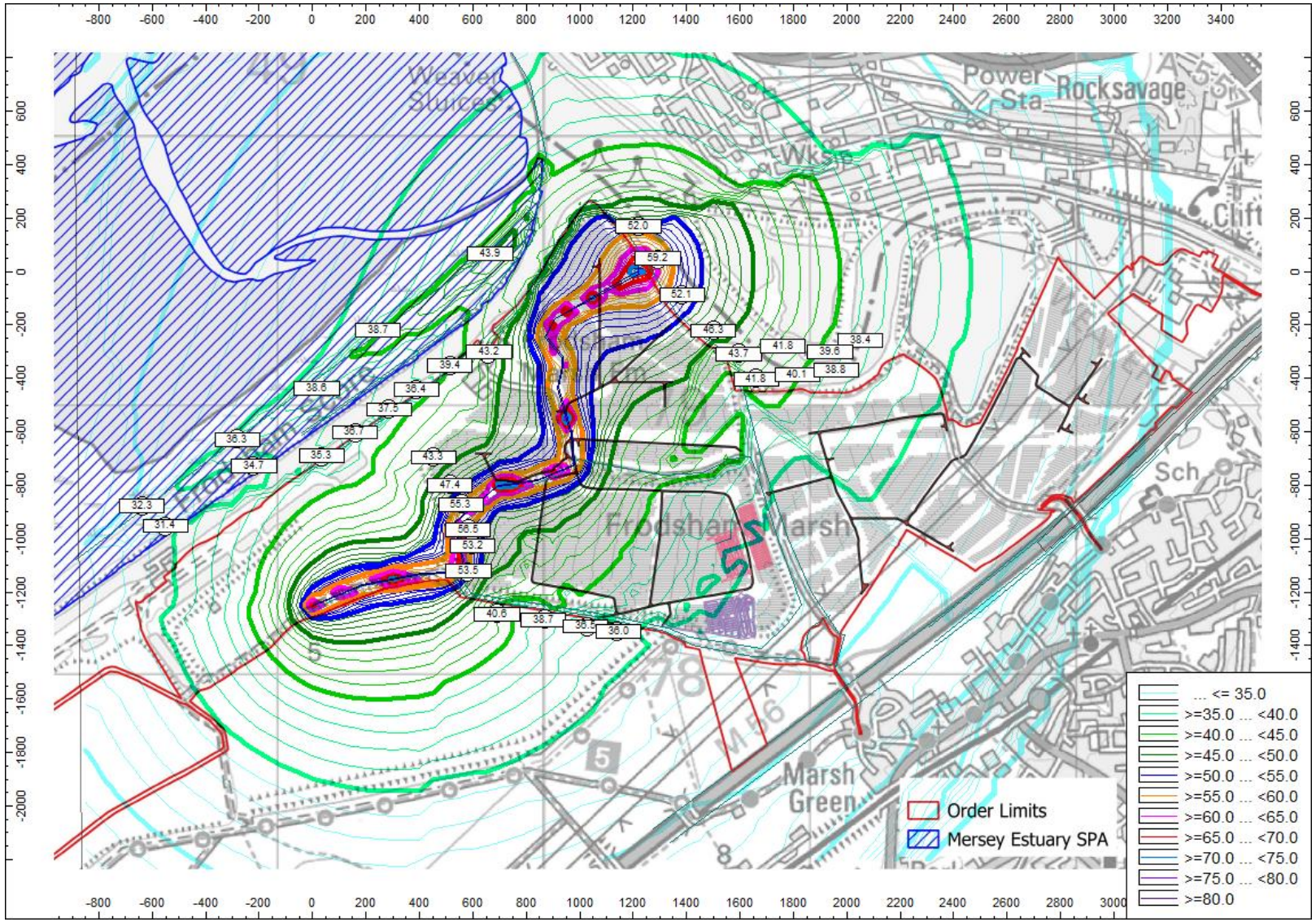
Map 5: Earthworks: NBBMA Works Cell 3 (LAmax)



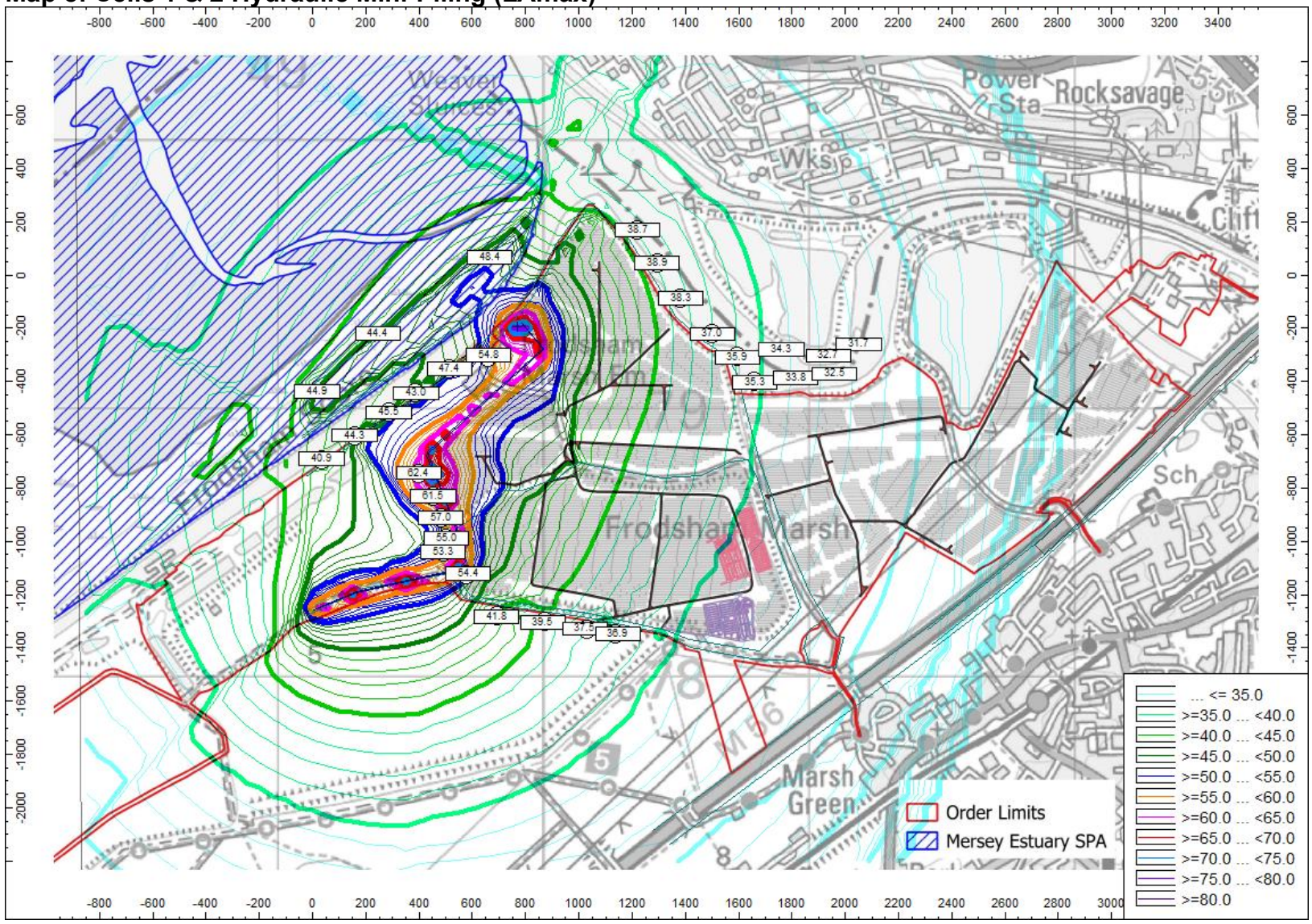
Map 6: Worst Case Earthworks (as per Appendix 4) - NBBMA Works Cell 3 (LAmax)



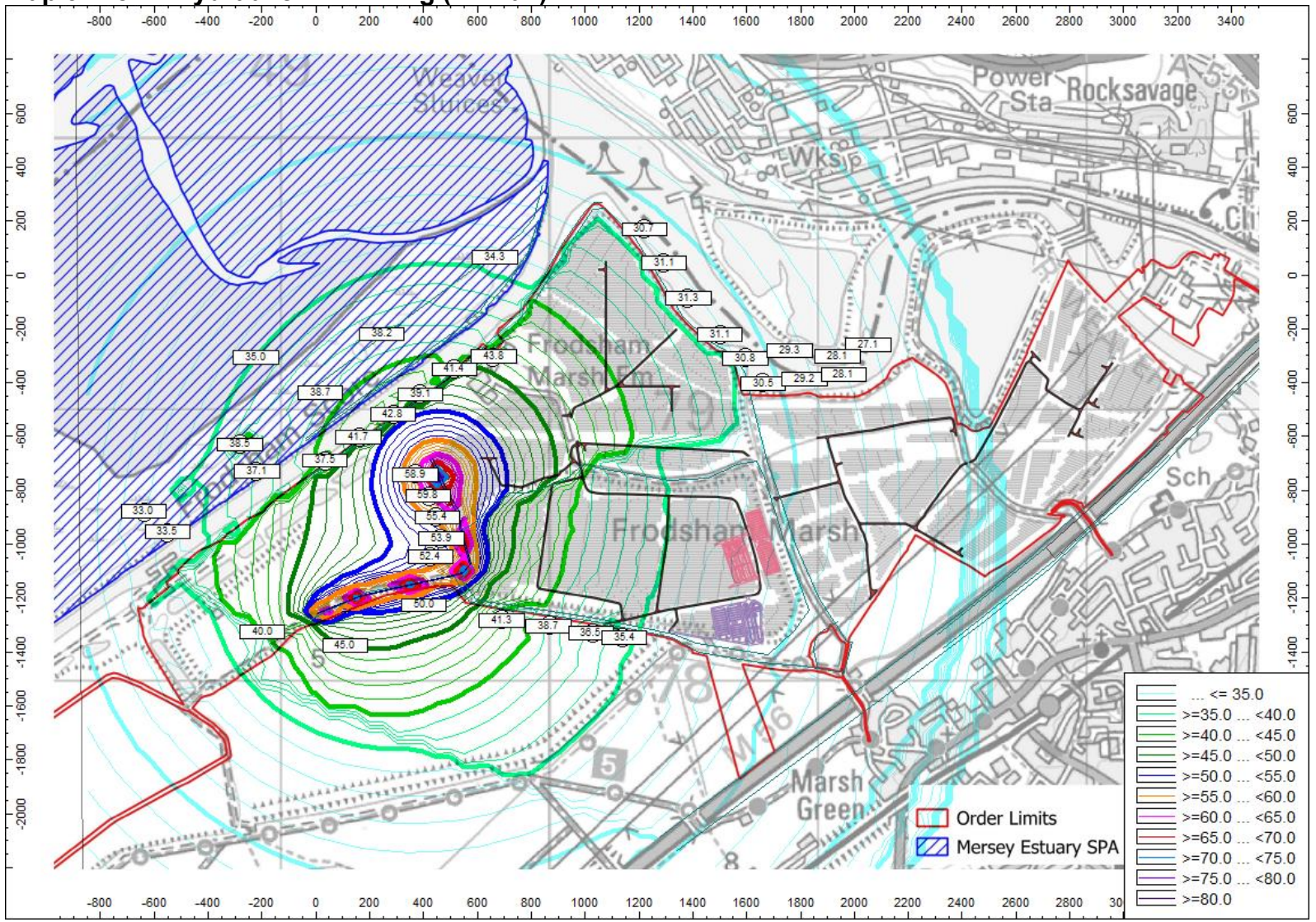
Map 7: Cell 1 Hydraulic Mini-Piling (LAmax)



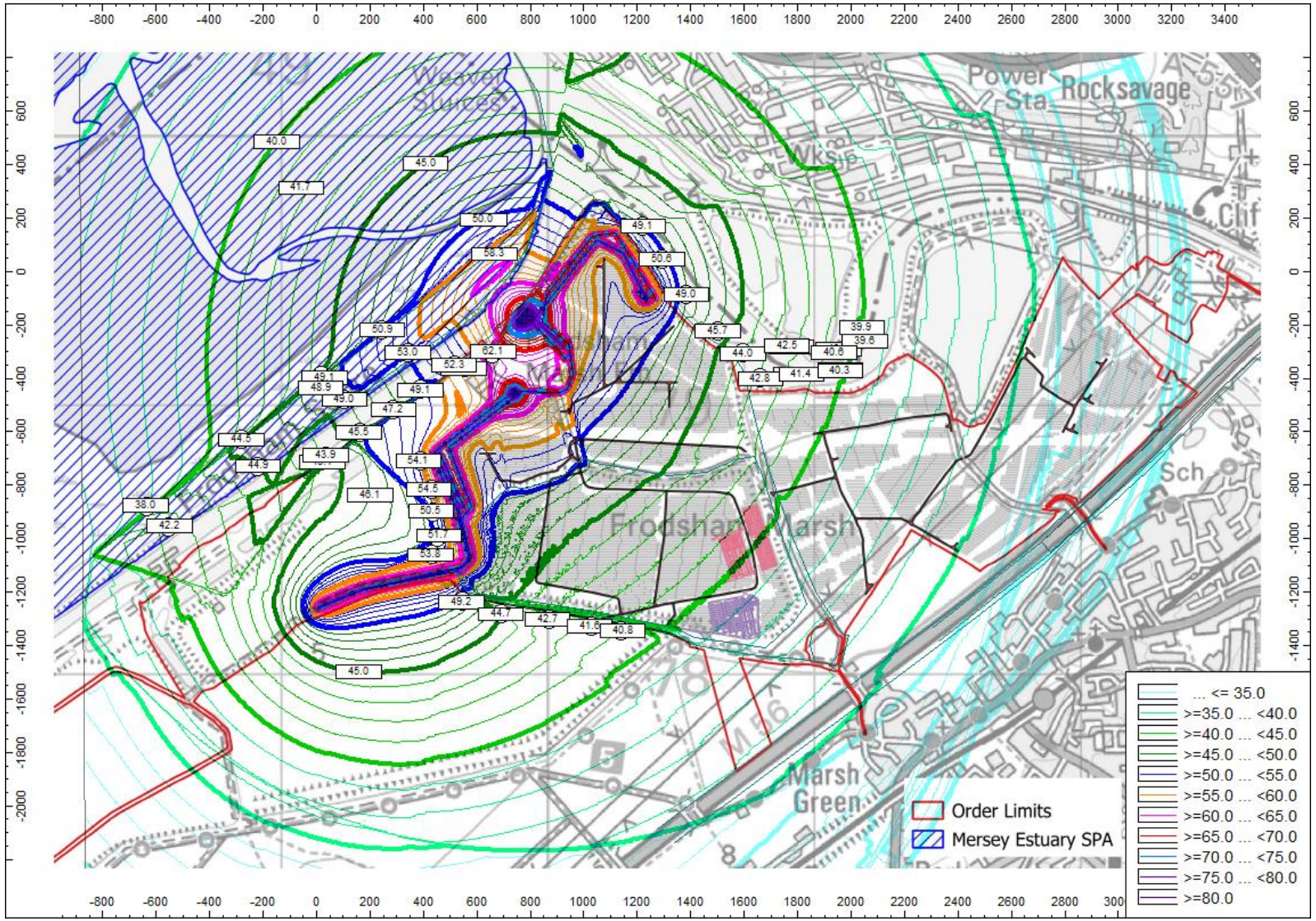
Map 8: Cells 1 & 2 Hydraulic Mini-Piling (LAmax)



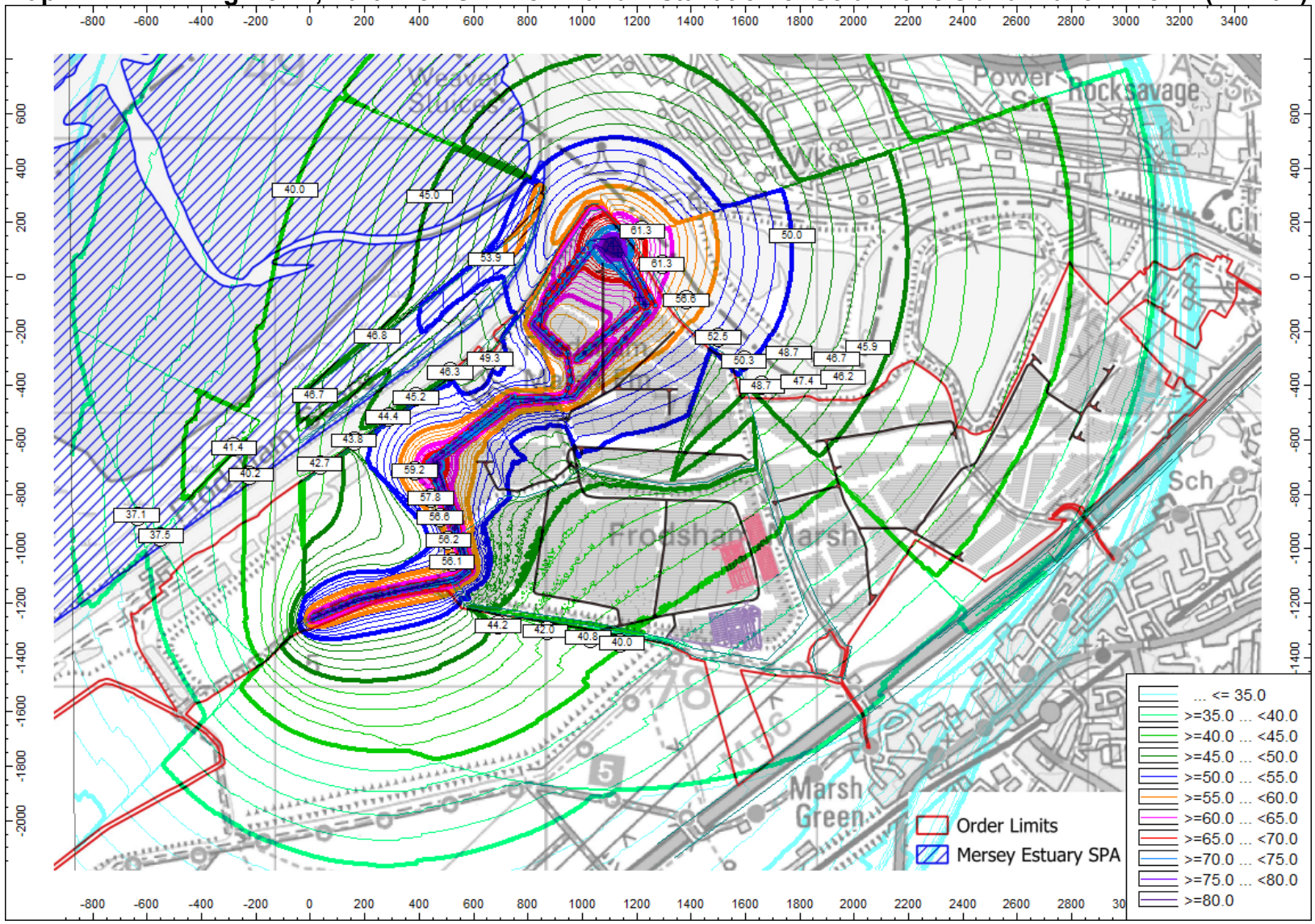
Map 9: Cell 2 Hydraulic Mini-Piling (LAmax)



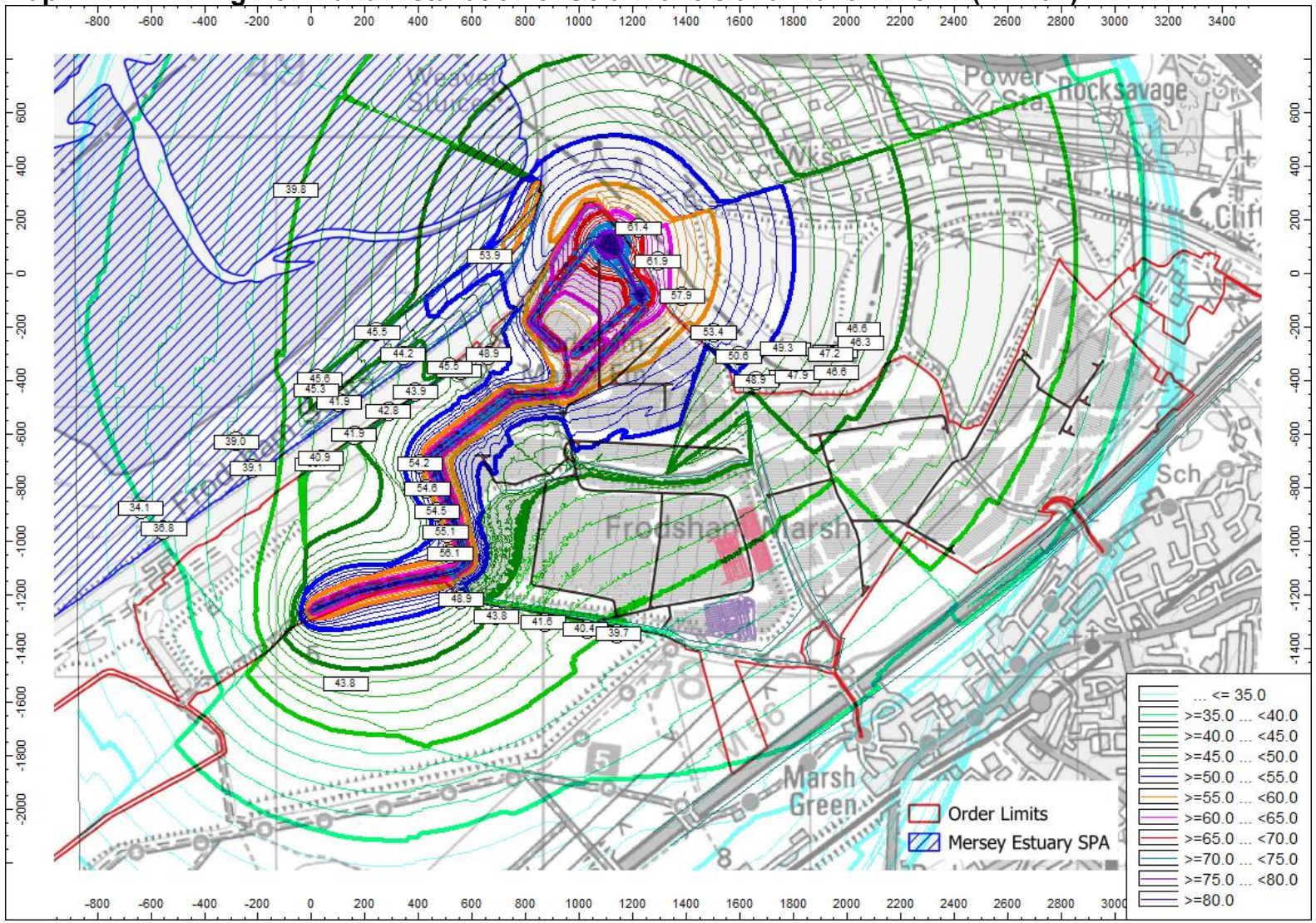
Map 10: Mini-Piling Cell 1, Earthworks in Cell 2 and Installation of Solar Panels and Plant in Cell 1 (LAmax)



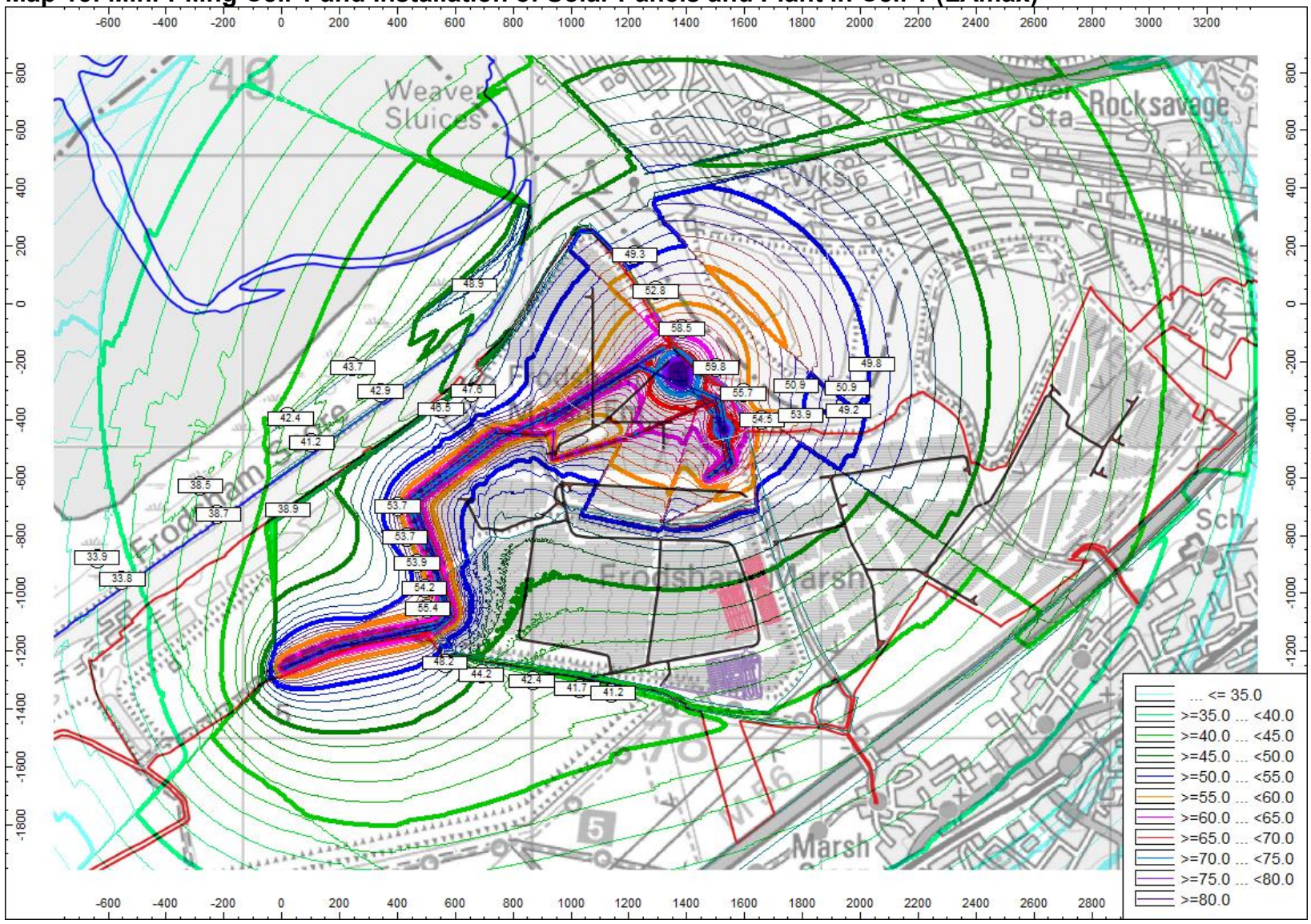
Map 11: Mini-Piling Cell 1, Earthworks in Cell 2 and Installation of Solar Panels and Plant in Cell 1 (LAmax)



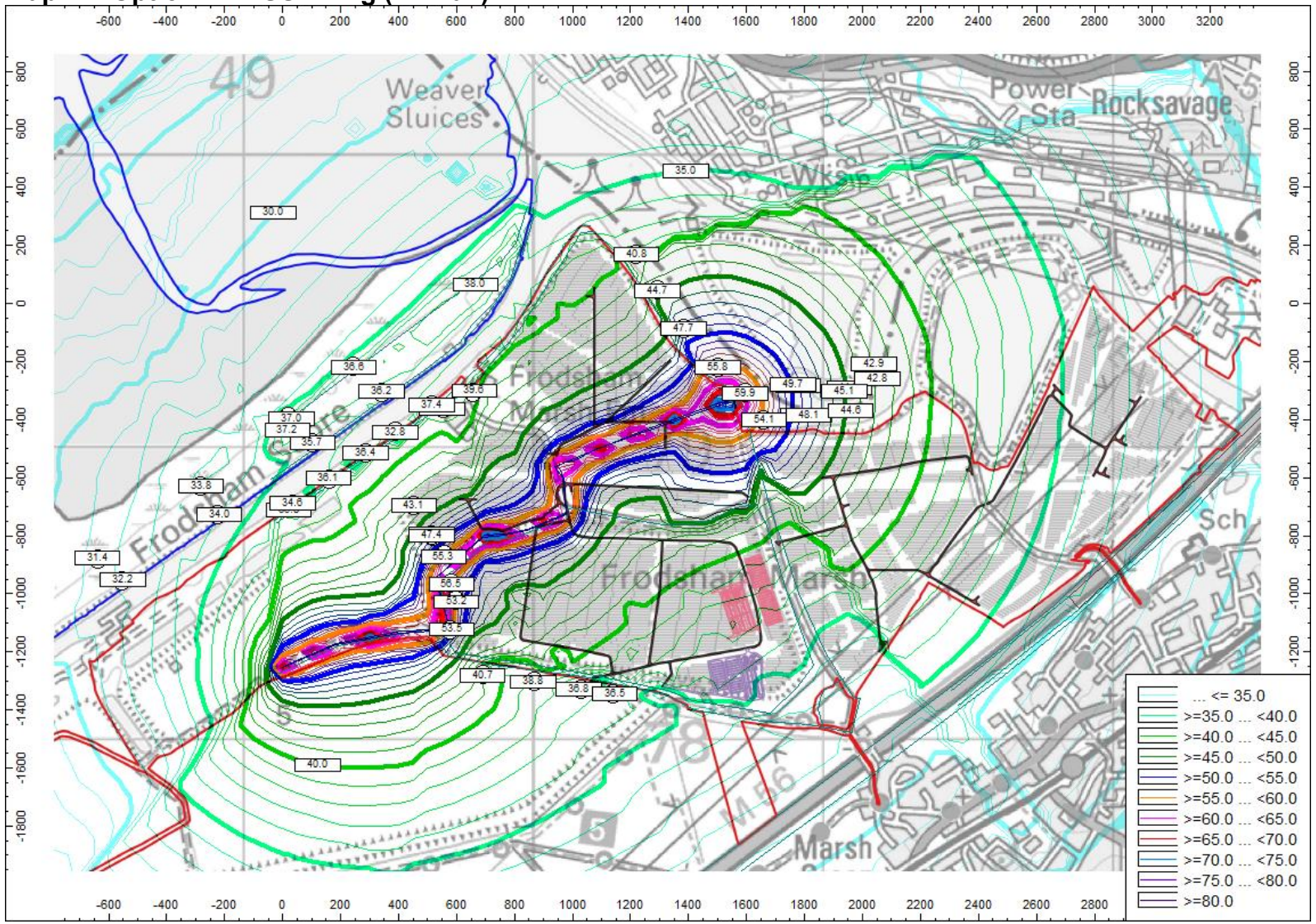
Map 12: Mini-Piling Cell 1 and Installation of Solar Panels and Plant in Cell 1 (LAmax)



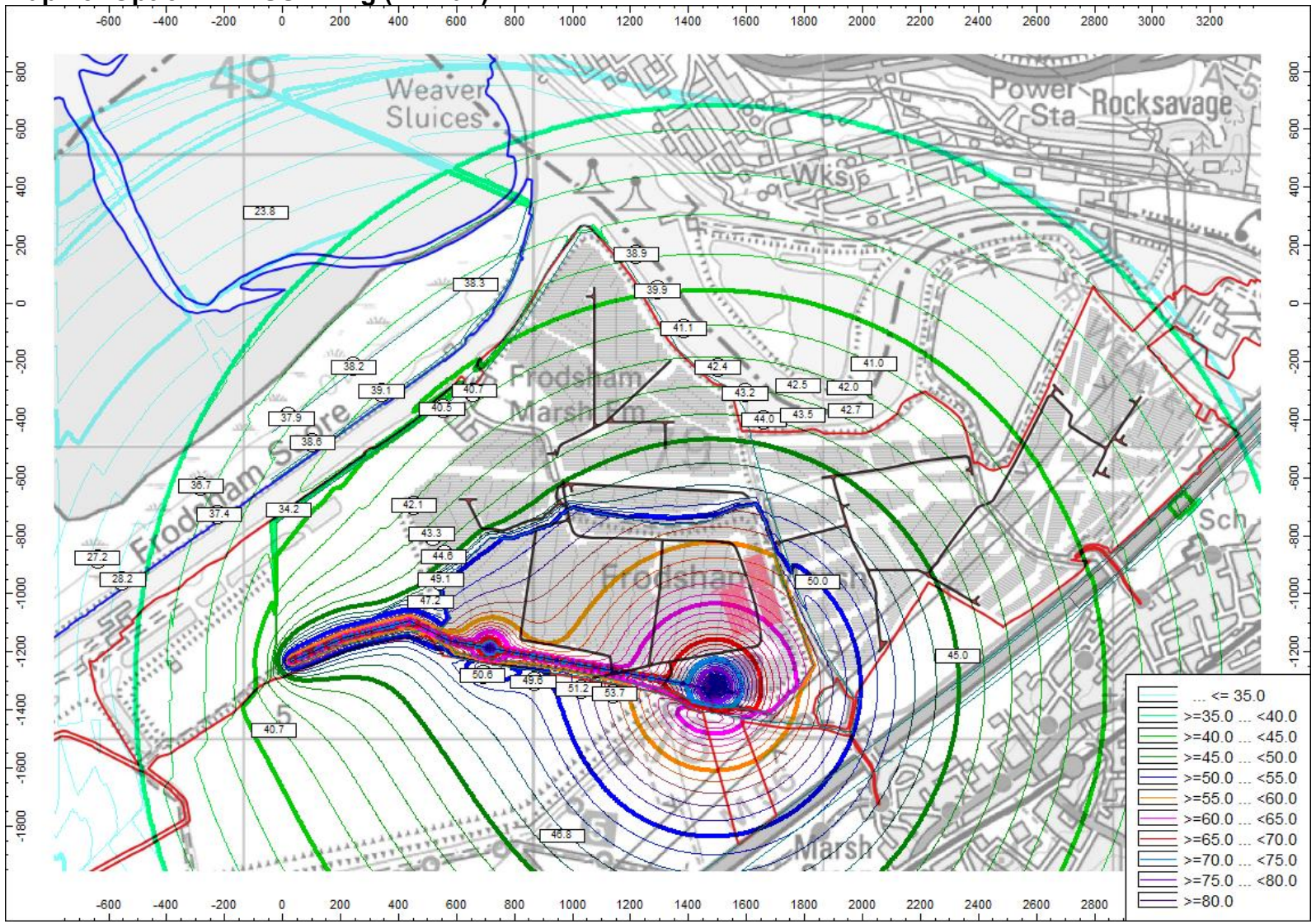
Map 13: Mini-Piling Cell 1 and Installation of Solar Panels and Plant in Cell 1 (LAmax)



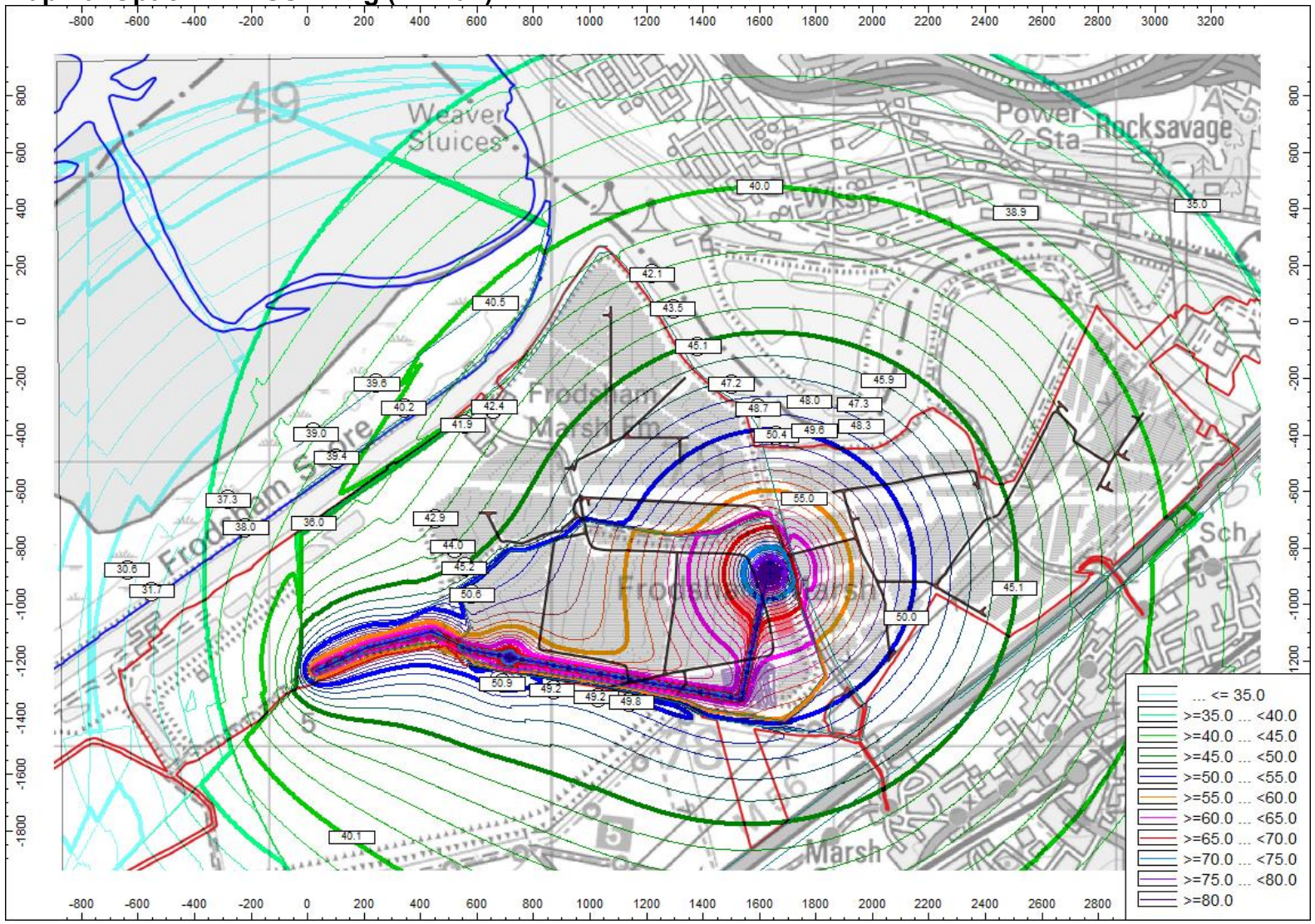
Map 14: Option 1 BESS Piling (LAmax)



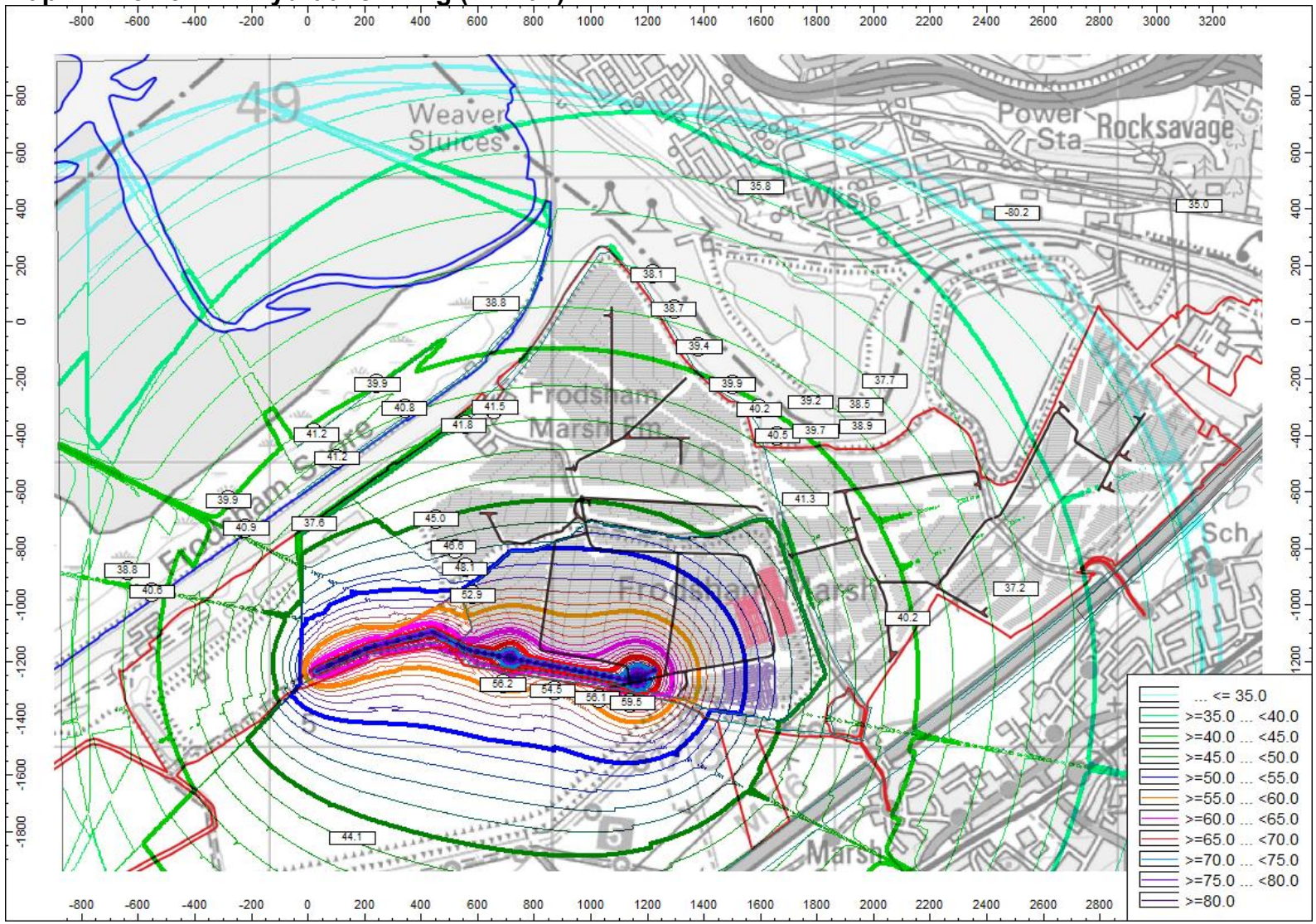
Map 15: Option 1 BESS Piling (LAmax)



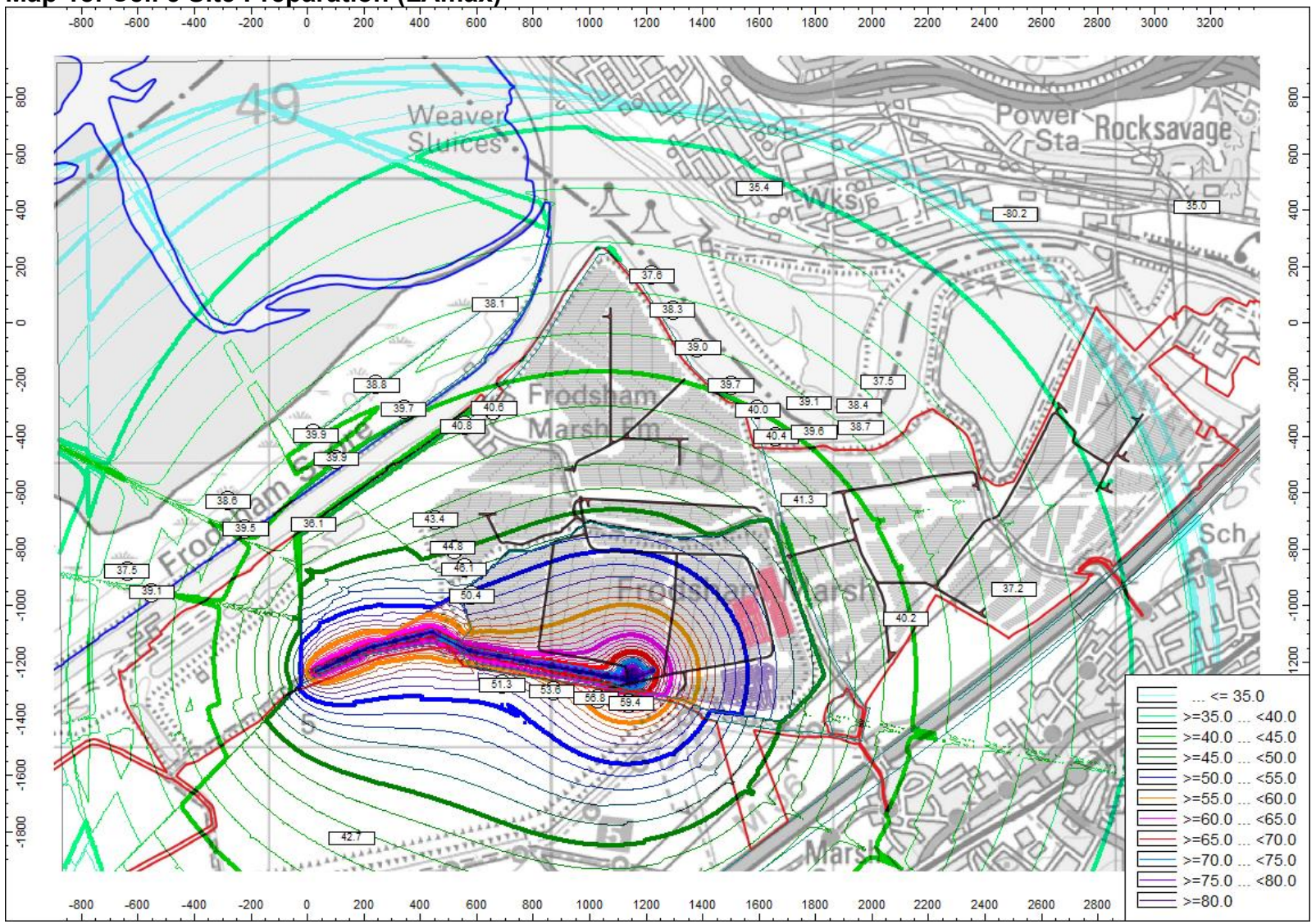
Map 16: Option 2 BESS Piling (LAmax)



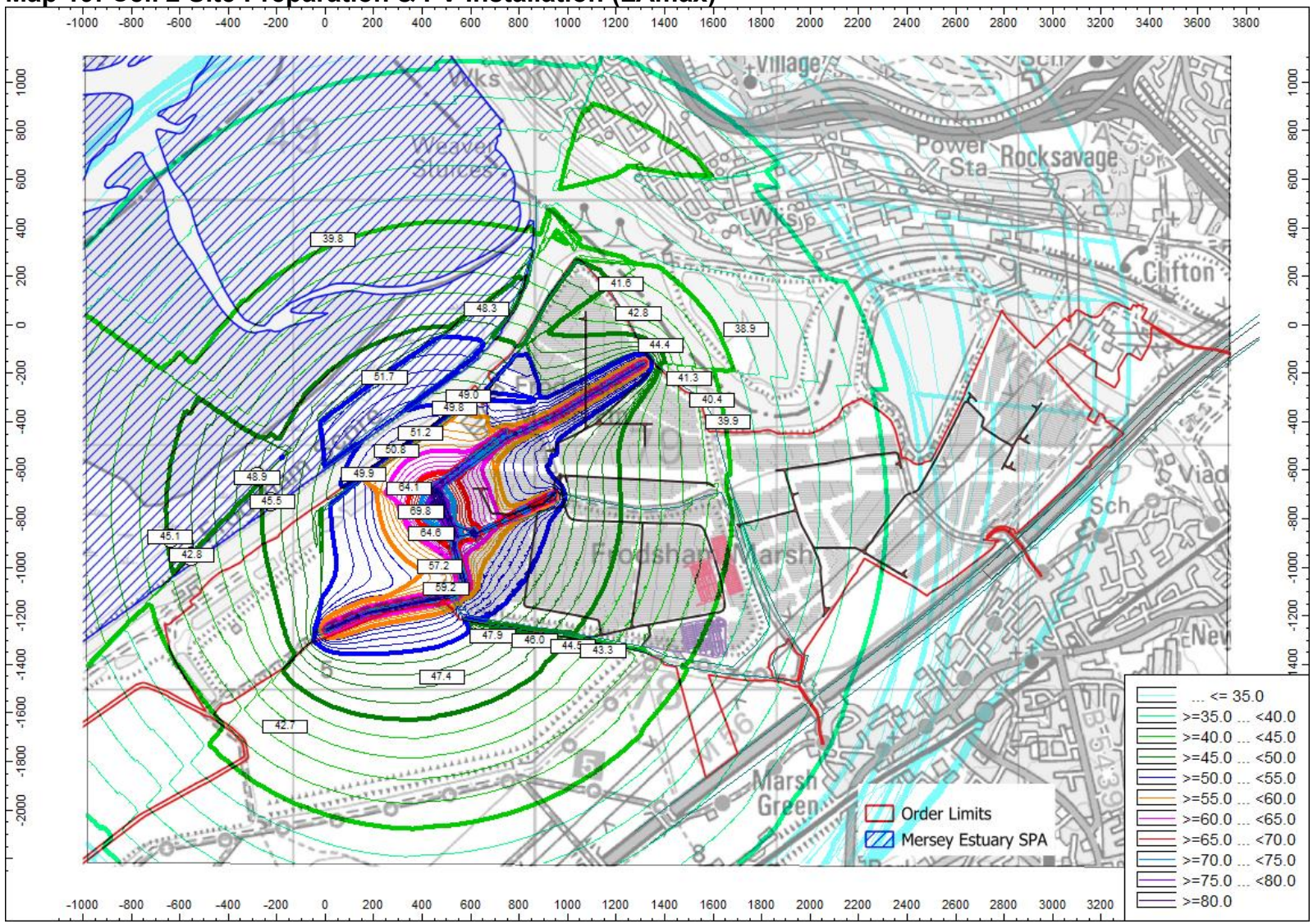
Map 17: Cell 5 Mini-Hydraulic Piling (LAmax)



Map 18: Cell 5 Site Preparation (LAmax)



Map 19: Cell 2 Site Preparation & PV Installation (LAmax)



Appendix 3: Additional Data for Other Assemblage Species

Additional table for the Western SADA

			AEL 22-23					AEL 23-24				AEL 24-25				
			Western SADA					Western SADA				Western SADA				
Month	**Mersey Estuary SPA Peak Count Mean (5-year)**	**Mersey SPA WeBS 5-year monthly average**	**Cell 1**	**Cell 2**	**Cell 5**	**Cell 3**	**Eastern SADA**	**Cell 1**	**Cell 2**	**Cell 5**	**Cell 3**	**Cell 1**	**Cell 2**	**Cell 5**	**Cell3**	Eastern SADA
Wigeon																
September	228	139	0	0	0	0	0	0	0	0	0	0	0	0	0	0
October	1225	548	0	0	0	0	0	0	0	0	0	0	0	0	5	0
November	1522	1286	0	0	0	0	0	0	0	0	0	0	0	0	53	0
December	3109	1826	0	0	0	0	0	0	0	0	0	0	0	0	26	0
January	4751	2224	0	0	0	0	0	0	0	0	19	0	0	0	0	0
February	912	841	0	0	0	0	0	0	0	0	18	0	0	0	158	0
March	2431	1396	0	0	0	0	0	0	0	0	25	0	0	0	169	0
April	37	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gadwall																
September	88	88	0	0	0	0	0	0	0	0	12	0	0	0	0	0
October	108	85	0	0	0	0	0	0	0	0	6	0	0	0	30	0
November	78	57	0	0	0	0	0	0	0	0	0	0	0	0	16	0
December	57	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0
January	47	37	0	0	0	0	0	0	0	0	0	0	0	0	8	0
February	70	55	0	0	0	0	3	0	0	0	2	0	0	0	6	4
March	138	104	0	0	0	0	0	0	0	0	6	0	0	0	6	0
April	84	75	0	0	0	0	2	0	0	0	0	0	0	0	0	0
Greylag goose																
September	45	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0
October	11	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
November	48	25	0	0	0	0	0	0	0	0	8	2	0	0	4	2
December	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
January	17	7	0	0	0	0	0	0	0	0	0	0	0	0	7	0
February	60	25	2	0	0	0	0	0	0	6	6	0	8	0	11	0
March	48	14	0	0	4	0	0	4	0	5	7	0	10	0	4	0
April	18	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mallard																
September	765	765	0	0	0	0	0	0	0	0	5	0	0	0	0	0
October	964	964	0	0	0	0	0	0	0	0	43	0	0	0	73	0
November	769	716	0	0	0	0	0	0	0	0	9	0	0	0	72	0
December	584	529	0	0	0	0	0	0	0	0	13	0	0	0	50	0
January	791	544	0	0	0	0	3	0	0	0	0	0	0	6	15	10
February	625	625	0	0	0	0	0	0	0	5	41	0	0	0	27	6
March	308	261	4	0	0	0	5	0	2	8	42	0	0	6	14	18
April	254	254	4	0	0	0	2	0	0	0	0	0	0	0	0	0

			AEL 22-23					AEL 23-24				AEL 24-25				
			Western SADA					Western SADA				Western SADA				
Month	**Mersey Estuary SPA Peak Count Mean (5-year)**	**Mersey SPA WeBS 5-year monthly average**	**Cell 1**	**Cell 2**	**Cell 5**	**Cell 3**	**Eastern SADA**	**Cell 1**	**Cell 2**	**Cell 5**	**Cell 3**	**Cell 1**	**Cell 2**	**Cell 5**	**Cell3**	Eastern SADA
Mute Swan																
September	26	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0
October	68	25	0	0	0	0	0	0	0	0	0	0	0	0	2	0
November	43	25	0	0	0	0	0	0	0	0	8	0	0	0	2	0
December	35	22	0	0	0	0	0	0	0	0	0	0	0	0	3	0
January	41	26	0	0	0	0	2	0	0	0	0	0	0	0	0	0
February	34	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0
March	29	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0
April	14	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oystercatcher																
September	741	741	0	0	0	0	0	0	0	0	0	0	0	0	0	0
October	785	785	0	0	0	0	0	0	0	0	0	0	0	0	0	0
November	881	680	0	0	0	0	0	0	0	0	0	0	0	0	1	0
December	887	753	0	0	0	0	0	0	0	0	0	0	0	0	0	0
January	792	693	0	0	0	0	0	0	0	0	0	0	0	1	1	0
February	687	687	0	0	0	0	0	0	0	0	0	0	0	0	0	0
March	884	686	0	4	0	0	0	0	0	0	2	0	0	0	0	0
April	405	337	0	0	0	0	0	0	0	0	4	0	0	0	0	0
Shoveler																
September	295	154	0	0	0	0	0	0	0	0		0	0	0	0	0
October	351	202	0	0	0	0	0	0	0	0	0	0	0	0	42	0
November	294	228	0	0	0	0	0	0	0	0	0	0	0	0	77	2
December	163	94	0	0	0	0	0	0	0	0	0	0	0	0	45	0
January	196	110	0	0	0	0	0	0	0	0	0	0	0	0	23	0
February	155	109	0	0	0	0	0	0	0	0	4	0	0	0	30	0
March	160	112	0	0	0	0	2	0	0	0	38	0	0	0	30	0
April	142	101	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Great crested grebe																
September	94	94	0	0	0	0	0	0	0	0	0	0	0	0	0	0
October	66	55	0	0	0	0	0	0	0	0	0	0	0	0	0	0
November	59	40	0	0	0	0	0	0	0	0	1	0	0	0	2	0
December	31	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0
January	35	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0
February	54	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0
March	43	43	0	0	0	0	0	0	0	0	0	0	0	0	0	0
April	50	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0

			AEL 22-23					AEL 23-24				AEL 24-25				
			Western SADA					Western SADA				Western SADA				
Month	**Mersey Estuary SPA Peak Count Mean (5-year)**	**Mersey SPA WeBS 5-year monthly average**	**Cell 1**	**Cell 2**	**Cell 5**	**Cell 3**	**Eastern SADA**	**Cell 1**	**Cell 2**	**Cell 5**	**Cell 3**	**Cell 1**	**Cell 2**	**Cell 5**	**Cell3**	Eastern SADA
Ruff																
September	23	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0
October	26	12	0	0	0	0	0	0	0	0	0	0	0	0	9	0
November	12	5	0	0	0	0	0	0	0	0	0	0	0	0	7	0
December	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
January	8	3	0	0	0	0	0	0	0	0	0	0	0	0	4	0
February	13	3	0	0	0	0	0	0	0	0	10	0	0	0	9	0
March	14	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
April	13	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tufted duck																
September	261	159	0	0	0	0	0	0	0	0	0	0	0	0	0	0
October	338	218	0	0	0	0	0	0	0	0	0	0	0	0	8	0
November	353	134	0	0	0	0	0	0	0	0	0	0	0	0	8	0
December	398	398	0	0	0	0	0	0	0	0	0	0	0	0	8	0
January	471	285	0	0	0	0	0	0	0	0	8	0	0	0	0	0
February	310	310	0	0	0	0	0	0	0	0	19	0	0	0	19	0
March	150	93	0	0	0	0	0	0	0	0	50	0	0	0	9	0
April	121	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Whooper swan																
September	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
October	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
November	12	8	0	0	0	0	0	0	0	0	1	0	0	0	0	0
December	25	16	0	0	0	0	0	0	0	0	1	0	0	0	0	0
January	26	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0
February	29	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0
March	28	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0
April	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dunlin																
September	1502	1329	0	0	0	0	0	0	0	0	0	0	0	0	0	0
October	9432	9432	0	0	0	0	0	0	0	0	0	0	0	0	0	0
November	37884	35373	0	0	0	0	0	0	0	0	0	0	0	0	9	0
December	40966	30230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
January	66284	28252	0	0	0	0	0	0	0	0	0	0	0	0	0	0
February	30131	27730	0	0	0	0	0	0	0	0	0	0	0	0	0	0
March	36036	18079	0	0	0	0	0	0	0	0	0	0	0	0	0	0
April	1718	783	0	0	0	0	0	0	0	0	0	0	0	0	0	0

			AEL 22-23					AEL 23-24				AEL 24-25				
			Western SADA					Western SADA				Western SADA				
Month	**Mersey Estuary SPA Peak Count Mean (5-year)**	**Mersey SPA WeBS 5-year monthly average**	**Cell 1**	**Cell 2**	**Cell 5**	**Cell 3**	**Eastern SADA**	**Cell 1**	**Cell 2**	**Cell 5**	**Cell 3**	**Cell 1**	**Cell 2**	**Cell 5**	**Cell3**	Eastern SADA
Pink-footed goose																
September	200	93	0	0	0	0	0	0	0	0	0	0	0	0	0	0
October	3950	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0
November	6244	3263	0	0	0	0	0	0	0	0	0	0	0	0	0	0
December	1760	1180	0	0	0	0	0	0	0	0	0	0	0	0	0	0
January	9783	4332	0	0	0	0	0	0	0	0	0	0	0	0	0	0
February	2455	2163	0	0	0	0	0	0	0	0	0	0	0	0	0	0
March	30738	12404	0	0	0	0	0	0	0	0	0	0	0	0	131	0
April	7360	2757	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water rail																
September	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
October	3	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0
November	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
December	4	3	0	0	0	0	0	0	0	0	0	0	0	0	1	1
January	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
February	6	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
March	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
April	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Snipe																
September	37	29	0	0	0	0	0	0	0	0	1	0	0	0	0	0
October	120	56	0	0	0	0	1	0	0	0	28	0	0	0	40	0
November	53	45	0	0	0	0	0	7	25	0	24	0	0	0	25	11
December	74	53	4	1	0	0	0	0	0	0	0	0	29	0	24	0
January	108	66	0	0	0	0	0	13	6	36	34	8	63	1	16	8
February	58	58	0	0	0	0	0	0	17	12	9	1	10	1	24	4
March	32	21	0	0	0	0	2	0	0	0	3	0	0	0	45	13
April	11	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Little egret																
September	211	141	0	0	0	0	0	0	0	0	0	0	0	0	0	0
October	173	105	0	0	0	0	0	0	0	0	0	0	0	0	0	0
November	123	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0
December	51	47	0	0	0	0	0	0	0	0	0	0	0	0	1	1
January	85	54	0	0	0	0	0	0	0	0	0	0	0	0	0	1
February	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0
March	96	55	0	0	0	0	0	0	0	0	0	0	0	0	1	1
April	146	64	0	0	0	0	0	0	0	0	0	0	0	0	0	0