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NZT Remediation
Ecological Impact Assessment

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Contents

1. Introduction

1.1 This document has been prepared by INCA on behalf of Teesworks in connection with the land remediation associated with the Net Zero Teesside (NZT) project.

1.2 This report assesses the ecological impact of the proposed development taking into account embedded mitigation and other mitigation measures to determine residual effects. It further proposes compensatory measures to ensure no net loss of biodiversity.

1.3 This chapter has been written with reference to the Chartered Institute of Ecology and Environmental Management ('CIEEM') guidelines for Ecological Impact Assessment ('EcIA') [i].

The assessment process involves:

Identifying and characterising impacts;

Incorporating measures to avoid and mitigate (reduce) these impacts;

Assessing the significance of any residual effects after mitigation;

Identifying appropriate compensation measures to offset significant residual effects; and

Identifying opportunities for ecological enhancement.

1.4 Impacts are actions that result in changes either positive or negative to ecological features. Effects are the outcomes for those features. The impacts of the proposed development are identified within this assessment and defined in terms of their effects on ecological features.

2. Project description

2.1 The draft description of the proposed development is as follows: "*Engineering operations associated with ground remediation and preparation of the site"*. The total area of the application site (henceforth referred to as the site) is 62.3ha and is shown in Figure 1.

2.2 The site lies at the very northern end of the Teesworks site and adjacent to the Coatham Quarries and Lagoons unit of the Teesmouth and Cleveland Coast SSSI, separated from it by the external South Gare access road. The topography of the site is essentially flat except for some mounds of tipped material and a shallow landscaping bund to the rear of the main office block.

2.3 A little under half of the site is vegetated. Buildings and other structures and associated hardstanding comprise approximately 20% of the unvegetated areas. The removal of the buildings and above ground structures does not form part of this application. Other than the landscaped area to the rear of the main office block, habitats on the site would be broadly classed as brownfield. There are no waterbodies or watercourses on the site though there is a large pond 200m to the west.

Figure 1. Site location plan

3. Scope of the assessment

3.1 This assessment covers all Valued Ecological Receptors (VERs) that are found in the wider Teesside area and which have the potential to be present on the site or else be affected by the development.

3.2 In assessing the impacts of a proposal the geographical extent over which those impacts on VERs might potentially be significant needs to be considered; this is referred to as the Zone of Influence ('ZOI'). The ZOI for the proposed development will vary depending on specific factors such as the ecology of the receptor, the sensitivity of the receptor to the potential impacts of the proposed development and potential pathways to the receptor. The conservation importance of the receptor also influences the extent of the ZOI, for example, the ZOI over which potential impacts on internationally designated sites are considered would be much greater than that of widespread habitats and species. For the purposes of this assessment, the following ZOIs have been used:

internationally designated sites - 10km from the closest site perimeter;

nationally designated sites – 5km from the closest site perimeter;

locally designated sites and Priority Habitats – 2km from the closest site perimeter;

protected species and Priority Species – The ZOI is dependent in part on the dispersal ability of the species, i.e. its potential to reach the site from its closest breeding population, therefore the ZOI is considered individually for each species in terms of its proximity to the site; and

widespread species and habitats – site only.

3.3 This assessment has assumed a worst-case scenario that all of the habitats on the site will be removed as part of the development.

4. Legislative and Planning context

Legislation

4.1 The following legislation is relevant to this chapter:

The Conservation of Habitats and Species Regulations 2017 [ii] ((as amended by The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 and hereafter referred to as 'Habitats Regulations');

Wildlife and Countryside Act (WCA) 1981 (as amended) [iii]; and

Natural Environment and Rural Communities (NERC) Act 2006 [iv].

The Environment Act 2021 [v]

4.2 The Environment Act 2021 includes a provision that Biodiversity Net Gain ('BNG') should be made a condition of the grant of planning permission. This will require developers to provide evidence of a minimum of 10% BNG. This will be demonstrated by the use of a Biodiversity Metric developed by Defra with BNG expected to become mandatory in 2023.

4.3 An Environment & Biodiversity Strategy has been developed by Teesworks to support the South Tees Area Supplementary Planning Document ('SPD') and which aligns with the requirements of the Environment Act 2021. The Strategy has identified habitat creation and enhancement schemes within and beyond the Teesworks area that can contribute towards BNG and provide a means of compensating habitat loss occurring from the development.

4.4 Until the Environment Act is reflected in national policy, full weight should be given to the policies of the Redcar and Cleveland Local Plan, 2018 [vi].

Planning Policy

4.5 The following planning policies are relevant to this assessment:

i. Redcar and Cleveland Borough Council ('RCBC') Local Plan (statutory policy) [vi];
ii. National Planning Policy Framework ('NPPF') [vii]; and
iii. South Tees Area SPD 2018 (non-statutory policy/ material planning consideration) [viii];

5. Desk study

5.1 The desk study is based principally on data collected by INCA, which has carried out ecological surveys across almost all of the industrial land in the wider South Tees area over a 20 year period, including the entirety of the Teesworks area. INCA has been the main organisation collecting ecological data across the Teesworks area, accumulating a significant number of species records relevant to the site and the surrounding area.

5.2 The desk study has also been carried out with reference to additional ecological information obtained by AECOM and submitted as part of the Net Zero Teesside Environmental Statement.

5.3 Additional information on wildlife that is relevant to this assessment and is in the public domain has also been utilised.

Internationally designated sites

5.3 There are two internationally designated sites within a 10km radius of the site; the Teesmouth and Cleveland Coast Special Protection Area ('SPA') and the Teesmouth and Cleveland Coast Ramsar site). SPAs are designated under the EU Wild Birds Directive. Ramsar sites are wetlands of international importance designated under the Ramsar Convention on Wetlands but which are afforded the same level of protection in policy terms in respect of new development as European sites. The Teesmouth and Cleveland Coast Ramsar site shares the same boundary as the Teesmouth and Cleveland Coast SPA except where the SPA includes a marine component. The intertidal element of the Teesmouth and

Cleveland Coast SPA is also classed as a European Marine Site and shares its interest features with the SPA.

Teesmouth and Cleveland Coast SPA

5.4 The Teesmouth and Cleveland Coast SPA was first classified in 1995 for its numbers of European importance of breeding little tern *Sternula albifrons,* passage sandwich tern *Thalasseus sandvicensis*, wintering red knot *Calidris canutus* and passage common redshank *Tringa totanus,* as well as an assemblage of over 20,000 waterbirds. The SPA was updated in 2000 to include additional areas of coastal and wetland habitats important for waterbirds.

5.5 As of the commencement of a formal consultation in 2019, the SPA was further extended to include at sea foraging areas for breeding little tern and breeding and foraging areas for common tern *Sterna hirundo*, the latter being proposed as a new qualifying feature in the light of recent increases in the size of the breeding population within the site. The extension includes additional areas of terrestrial habitats such as wet grassland, saltmarsh, deep and shallow pools and intertidal areas important for other foraging and roosting waterbirds which were existing features of the SPA. Non-breeding ruff *Calidris pugnax* and breeding pied avocet *Recurvirostra avosetta* have also been added as new qualifying features of the SPA.

5.6 The boundary of the SPA extension covers an area from Castle Eden Denemouth in the north to Marske-by-the Sea in the south and includes the River Tees up to the Tees Barrage resulting in a revised SPA area of 12,226.28 ha. This increases the area of the existing SPA (1,251.50 ha) by 10,974.78 ha. The seaward boundary has been drawn to include waters out to around 3.5km from Crimdon Dene, to include the areas of greatest importance to the little terns at that colony, and out to around 6km offshore further south to include the areas of greatest importance to the common terns at the Saltholme colony.

Teesmouth and Cleveland Coast Ramsar

5.7 The existing Teesmouth and Cleveland Coast Ramsar boundary has also been extended, as with the SPA, to include the additional terrestrial wet grassland, saltmarsh, deep and shallow pools and intertidal areas for breeding and non-breeding waterbirds. Historically the Teesmouth SPA and Ramsar have effectively shared the same boundary and interest features however the Ramsar extension will only cover those terrestrial extension areas of the SPA down to Mean Low Water and will not extend outside of the SPA extension. Although not a qualifying feature the Ramsar site citation recognises that the site supports a rich assemblage of invertebrates, including the following seven Red Data Book species: *Pherbellia grisescens, Thereva valida, Longitarsus nigerrimus, Dryops nitidulus, Macroplea mutica, Philonthus dimidiatipennis* and *Trichohydnobius suturalis*.

Nationally Designated Sites

5.8 There are two nationally designated sites within a 5km radius of the proposed development site; Teesmouth & Cleveland Coast Site of Special Scientific Interest ('SSSI') and Teesmouth National Nature Reserve ('NNR'). The NNR is a sub-set of the SSSI and comprises two parts; the intertidal mudflats at Seal Sands and the dunes and grazing marshes around North Gare. As it is a part of the SSSI with the same interest features then it is not described or assessed separately in this chapter.

5.9 The Teesmouth and Cleveland Coast SSSI is an amalgamation and rationalisation of the seven SSSIs which were formerly present in the Teesmouth area. It extends the original SSSIs geographically to underpin the non-marine elements of the extension to the Teesmouth and Cleveland Coast SPA and Ramsar (the SPA) and includes some additional, areas that are outside of the SPA as well as adding new interest features. The Teesmouth and Cleveland Coast SSSI was confirmed by Natural England in January 2019. The interest features of the SSSI and their relation to the site are shown in Table 2.

Table 2. Interest features of the Teesmouth and Cleveland Coast SSSI in relation to the NZT remediation site

Qualifying feature	Principal locations with respect to Lackenby	Distance to Lackenby (km)
Jurassic Geology	Redcar Rocks	2.3 E
Quaternary Geology	Seaton Carew	7.5 NW
Saltmarsh	Confined almost entirely to the Greatham Creek area north of the Tees. There is a very small amount at Bran Sands	5.8W Greatham Creek 2.0 W Bran Sands
Sand Dunes	Coatham – South Gare to Coatham Common, Seaton Dunes in Hartlepool.	0.1 N Coatham Dunes 3.3 NW Seaton Dunes
Harbour Seal	Present in the estuary and river. Hauls out on Seal Sands and Greatham Creek. There are no haul out locations south of the Tees	5.8W Haul-out
Breeding Birds	Present on all areas of suitable wetland habitat. South of the Tees, Coatham Marsh and South Gare are the key areas.	0.8 SE Coatham Marsh 1.6 N South Gare
Non -breeding Birds	Present on intertidal, freshwater and marine areas. South Gare and Bran Sands Lagoon are the closest sites holding significant numbers.	1.6 N South Gare 1.6 SW Bran Sands Lagoon
Invertebrate Assemblage	Coatham Dunes is of particular importance	0.1 N

5.10 The Teesmouth and Cleveland Coast SSSI is an extensive mosaic of coastal and freshwater habitats centred on the Tees Estuary, including sand dunes, saltmarsh, mudflats, rocky and sandy shore, saline lagoons, grazing marshes, reedbeds and freshwater wetlands. These habitats support rich assemblages of invertebrates, breeding seals and large numbers of breeding and non-breeding seabirds and waterbirds. The site is of special interest for the following nationally important features that occur within and are supported by the wider habitat mosaic:

Jurassic geology

5.11 The foreshore between Redcar Rocks and Coatham Rocks provides exposures of parts of the Lower Jurassic succession that are otherwise unexposed in the Cleveland Basin. These complement the younger Lower Jurassic successions exposed further south in Robin Hood's Bay and are sedimentologically distinct from rocks of the same age to the south of the Market Weighton Axis. The sequence of ammonite assemblages that occur here indicates that the succession is very complete and may provide a key for the comparison of other Hettangian and Sinemurian successions in the Northwest European Province.

Quaternary geology

5.12 Tees Bay includes a feature known as the 'submerged forest' which has been well studied on the foreshore at Hartlepool between Carr House Sands and just north of Newburn Bridge but which is also exposed south of Teesmouth on the foreshore at Redcar. On the Hartlepool foreshore there is complex of peats, estuarine and marine sediments deposited during the Holocene, which overlie glacial deposits from the last Ice Age. Within the peats there are tree stumps and branches. This sequence is also rich in fossils and contains archaeological evidence from the Mesolithic to the Romano-British periods. The palaeoenvironmental records at Hartlepool indicate changes in sedimentation due to fluctuations in relative sea level during the mid-Holocene, from approximately 7,000 to 3,000 years BP. The location of Hartlepool on the fulcrum between areas of crustal uplift to the north and subsidence to the south makes these sediments crucial in interpreting Holocene sea level change.

Saltmarsh

5.13 The Tees Estuary supports the largest area of saltmarsh between Lindisfarne and the Humber Estuary. Its saltmarshes show a succession of vegetation types, from pioneer marshes of glasswort *Salicornia* species and annual sea-blite *Suaeda maritima*, through common saltmarsh-grass *Puccinellia maritima* communities, to stands dominated by common couch *Elytrigia repens* and its hybrid with sea couch *Elytrigia atherica, Elytrigia x drucei*, at the limit of tidal influence. The common saltmarsh-grass communities are diverse and sea aster *Aster tripolium*, common sea-lavender *Limonium vulgare* and thrift *Armeria maritima* provide a colourful late summer display.

Sand dunes

5.14 The SSSI supports an extensive complex of dunes flanking both side of the Tees Estuary. It is the largest dune complex between Druridge Bay (Northumberland) and Spurn Point (East Yorkshire). There are two main dune systems: Seaton Dunes to the north of the Tees, and Coatham Dunes to the south. The dunes support a large area of semi-natural vegetation including the typical succession from strandline vegetation, occasionally including sea sandwort *Honckenya peploides* and sea rocket *Cakile maritima*, through foredunes of sand couch *Elytrigia juncea* and mobile dunes dominated by both marram *Ammophila arenaria* and lyme-grass *Leymus arenarius*, to fixed dune grassland with diverse swards, where herbs such as common bird's-foot trefoil *Lotus corniculatus*, lady's bedstraw *Galium verum*, fairy flax *Linum catharticum* and common restharrow *Ononis repens* form a prominent component. The fixed dunes also support a number of scarce and threatened species, including purple milkvetch *Astragalus danicus*. There are a number of damp depressions in both dunes ('slacks'), which support a range of wetter vegetation types. A particularly prominent feature of some of the slacks are large and colourful stands of marsh orchids *Dactylorhiza* species and their hybrids. Some of the slacks show affinities with saltmarsh vegetation, with salt-tolerant species such as saltmarsh rush *Juncus gerardii*, sea plantain *Plantago maritima* and sea milkwort *Glaux maritima*. More consistently wet slacks support swamp communities. The dunes also show transitions to wetter habitats and saltmarsh.

Harbour seal

5.15 Harbour seals *Phoca vitulina* (also known as common seal) have lived at the mouth of the River Tees for hundreds of years but were lost from the estuary for much of the 20th Century, principally due to pollution. They recolonised the estuary in the 1980s and have subsequently established a regular breeding colony which is the only pupping site in north-east England. Harbour seals are present in the estuary and the tidal Tees throughout the year, with regular haul outs at Greatham Creek and Seal Sands. Pupping tends to occur in June and July on the intertidal mud of Seal Sands.

Breeding birds

5.16 The SSSI supports nationally important numbers of three breeding species: pied avocet, little tern and common tern. Pied avocets and common terns both nest within the SSSI. Little terns from a large nearby colony at Crimdon (in the adjacent Durham Coast SSSI) use the SSSI for foraging and pre- and post-breeding gatherings, with only occasional recent nesting attempts. The extensive sand dunes, saltmarshes and wetlands across the site support a diverse assemblage of breeding birds. This includes a number of scarce and declining species, such as shoveler *Spatula clypeata,* pochard *Aythya ferina*, ringed plover *Charadrius hiaticula* and little ringed plover *Charadrius dubius*.

Non-breeding birds

5.17 The extensive areas of open water, grazing marsh and intertidal habitats within the site provide safe feeding and roosting opportunities for large numbers of waterbirds throughout the year. The SSSI is of special interest for its non-breeding populations of ten species (shelduck *Tadorna tadorna*, shoveler, gadwall *Mareca strepera,* ringed plover, red knot *Calidris canutus*, ruff, sanderling *Calidris alba*, purple sandpiper *Calidris maritima*, common redshank, Sandwich tern) and an assemblage of over 20,000 non-breeding waterbirds. The assemblage comprises a wide variety of waterbirds, including (in addition to the aforementioned species that are reasons for notification in their own right), large numbers of wigeon *Mareca penelope,* lapwing *Vanellus vanellus*, black-headed gull *Chroicocephalus ridibundus* and herring gull *Larus argentatus*. Shoveler, gadwall and ruff are predominantly associated with the extensive freshwater wetlands of the site, while ringed plover, red knot, sanderling, purple sandpiper and sandwich tern mostly use the open coast. Common redshank are widespread across the site, but the greatest foraging concentrations occur, along with the largest

numbers of shelduck, on the intertidal mud of Seal Sands and Greatham Creek. Seal Sands and Bran Sands are also regularly used by ringed plover and red knot.

Invertebrate assemblage

5.18 The extensive complex of sand dunes within the SSSI supports a nationally important invertebrate assemblage, including at least 14 threatened species. The assemblage is diverse and makes use of a wide range of niches, with a strong dependency on open but consolidated sand exposures within which to nest and hunt, as well as on flower-rich swards for nectar and pollen gathering. The assemblage does not include a high number of rarities but is a good example of its type in the north of its range. As such, species such as the tephritid fly *Acanthiophilus helianthi*, whose larvae feed within the capitula of carline thistle, occur towards the northern edge of their British range. The grayling butterfly *Hipparchia semele* is found here and remains a scarce species on this north-eastern coastal strip.

Locally designated sites

5.19 There is one locally designated site within 2km of the site, Eston Pumping Station Local Wildlife Site. Eston Pumping Station Local Wildlife Site is 1.4km south of the site and is designated for its mosaic of habitats, including "Urban Grassland", a form of brownfield habitat.

Protected species

Great Crested Newt *Triturus cristatus* (GCN)

5.20 INCA carried out GCN surveys of all of the waterbodies on the Teesworks area in 2007 and of four ponds at Teesport in 2005. All proved to be negative for GCN. More recently, INCA has undertaken environmental DNA surveys for GCN at Long Acres and The Foundry on the Teesworks area, in 2019 and 2021 respectively, and at various waterbodies at the nearby Wilton Industrial Complex and Lazenby village over the period 2018-2020. All of these eDNA surveys have proved negative for GCN. There is an unconfirmed record of GCN from a pond on the golf course at Coatham, approximately 300m to the east of the site. This record was from 1988 and the pond where it was recorded no longer exists. The negative eDNA result from 2019 was from a pond within 200m of the unconfirmed 1988 record so it is unlikely on that basis that a population exists in this area.

5.21 The closest current records of GCN to the site are from Errington Woods and Lovell Hill Ponds which are both approximately 7km away to the south east and south respectively. There are records from the 1980s from Wilton Lake however this was surveyed in 2013 along with a further nine water bodies between Marske and the Wilton Industrial Complex for the Forewind Dogger Bank wind turbine proposal, all of which proved negative for GCN (Peak Ecology, 2013)[ix].

Bats

5.22 The Net Zero Teesside Environmental Statement reports moderate levels of activity across the site by common pipistrelle *Pipistrellus pipistrellus* and low levels of activity by soprano pipistrelle *Pipistrellus pygmaeus* and noctule *Nyctalus noctula*. Causal surveys by Cleveland Bat Group have found that there is activity by pipistrelle bats across the length of Coatham Dunes with notably high levels at South Gare.

Reptiles

5.23 The only native reptile species which is found in the surrounding areas is common lizard *Zootoca vivipara*. It is confined to the coastal dune areas from South Gare to Coatham Common from where small numbers have spread into the northern end of the Teesworks area. Surveys by INCA have found small numbers of common lizards at various points on the Long Acres site, including a small population just north of The Fleet watercourse. There has been the occasional record of common lizard from the application site itself but these have been confined to the northern fence line and a small mound in the north east corner, the latter at grid reference NZ574255.

5.24 INCA carried out a reptile survey of an area of suitable reptile habitat within the northern end of the site, at grid reference NZ570255, in 2020 [x]. This produced a negative result which suggests that common lizards have not spread further onto the site from the perimeter. A reptile survey by Quants

Ecology in grassland in the south east portion of the application site in 2018 also produced negative results [xi].

Breeding Birds

5.25 The Teesworks area supports a wide diversity of breeding birds, including a variety of ground-nesting birds associated with the flat, open areas. No specific nesting bird surveys have been carried out on the site but little ringed Ppover, a Schedule 1 protected species, bred on the site in 2021. Grey partridge *Perdix perdix*, is also present and likely to be nesting. A small number of common bird species are expected to nest in the scrub in habitat block 10.

Priority and other notable species

European Hedgehog *Erinaceous europaeus*

5.26 European hedgehog has been recorded on the northern end of the Teesworks site including within 300m of the site.

Brown hare *Lepus europaeus*

5.27 The industrial sites on Teesside are thought to support some of the largest populations of brown hare in north east England due to the combination of extensive grassland areas and lack of disturbance. Brown hare is regularly seen on the application site.

Common toad *Bufo bufo*

5.28 Common toad has been recorded as breeding in most ponds in the Teesworks area and in a pond on Coatham Dunes within 20m of the application site.

Dingy skipper butterfly *Erynnis tages*

5.29 There have not been any targeted surveys for butterflies on the site however dingy skipper is known to be present in regionally significant numbers when assessed across the entire Teesworks area. It is present on Long Acres and will almost certainly be present on the site, potentially in significant numbers, given that there are relatively large areas of suitable habitat.

Grayling butterfly *Hipparchia semele*

5.30 There have not been any targeted surveys for butterflies on the site however grayling is known to be present in high numbers, potentially into three figures, across the site. There has been a single count of over 50 individuals from habitat block 7 alone.

Other invertebrates

5.31 There have been no targeted surveys for moths or other invertebrates on the site. Certain parts of the Teesworks area are important for some groups of invertebrates such as those associated with specialist habitats such as Open Mosaic Habitats and wetlands, neither of which are present on the site.

Invasive Non-Native Species (INNS)

5.32 No INNS have been recorded on the site however it is known that some terrestrial species such as Japanese knotweed *Fallopia japonica*, Japanese rose *Rosa rugosa*, and various *Cotoneaster* species are scattered across the Teesworks area including adjacent to the site.

6. Habitat survey

Survey details

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6.1 The site was visited in July 2019. Weather conditions at the time of the survey were dry but overcast, with a gentle breeze. The site visit was undertaken by Ian Bond CEnv MCIEEM, who is an ecologist with INCA. He has over 20 years' experience of working in an ecological role on Teesside, which includes 12 years as a local authority ecologist. He is an experienced surveyor for vascular plants, all terrestrial vertebrates and Lepidoptera.

6.2 The purpose of the survey was to define the nature of the habitats present and to assess the condition of each habitat so that a biodiversity metric could be applied. This was part of a larger survey which aimed to assess habitats across the industrial areas on Teesside. Only the vegetated parts of the site were surveyed, as only those would score in a metric.

Survey methodology

6.3 The survey area was divided into habitat blocks, which were areas across which the habitat type and condition were the same. In order to simplify what was a large scale survey, a minimum size unit of 0.25ha for a habitat block was used. Areas of habitat which were smaller than that were considered as part of the surrounding habitat block and influenced the assessment of the larger habitat block.

6.4 In some cases there was gradation both within and between habitat blocks in terms of the habitat type and/or its condition. In such cases, professional judgement was used to define boundaries and habitat type and condition.

6.5 The survey classified the habitats according to JNCC Phase 1 categories [xii]. These were later translated into UK Habitats Classification definitions [xiii] in order to use them with the Defra BM2.0 metric [xiv]. Notes were taken on the topography, substrate and key plant indicator species for each habitat. No targeted surveys were undertaken for any taxa however notes were made of any notable species seen and of the potential for notable species to be present.

6.6 It should be noted that the Defra BM2.0 metric requires a level of professional judgement in assigning a habitat type or condition score. Consequently, when calculating the number of biodiversity units associated with the habitats on site, the Defra BM2.0 metric has been used in conjunction with some additional definitions which have been devised by INCA, in agreement with the Tees Estuary Partnership, in order to provide further clarity. These definitions have previously been applied to all areas of habitat on Teesworks that have been subject to planning applications and so were also used here to provide consistency.

6.7 In addition to the formal habitat survey undertaken in July 2019, INCA has been on the site on numerous occasions between that survey and the present time, for example to conduct reptile surveys and undertake nesting bird checks. While no further vegetation surveys have been undertaken on those occasions it has given the opportunity to gain a wider appreciation of the botanical value of the site across all seasons.

Survey limitations

6.8 It was not possible to survey habitat block 12 due to lack of access. It was however possible to view this small block of habitat from the adjacent road and ascertain that it was a relatively low value, isolated habitat. Therefore, the inability to survey this habitat block is not considered to have made any significant effect on the assessment.

6.9 No detailed surveys for invasive non-native species across the entire site have been undertaken.

7. Habitat survey results

7.1 Each habitat block is defined below and assigned a UK Habitats Classification category.

7.2 The approximate boundaries of each habitat block are shown in Figure 2. When calculating the overall BDUs for the site, only those portions of each habitat block that are in the red line boundary have been included in the calculations.

Habitat Block 1. UK Habitats Classification: Modified Grassland
The substrate was largely based on weathered blast furnace slag, though the topography was very diverse due to mounds of tipped material. This included some large stones and boulders. The vegetation mainly comprised rank, species-poor grass with small amounts of herbs. Bare ground covered approximately 30% of the area and the few herbs that were present were mainly kidney vetch *Anthyllis vulneraria* and viper's bugloss *Echium vulgare*. Overall the habitat condition was assessed as being fairly poor.

Habitat Block 2. UK Habitats Classification: Artificial, unvegetated, unsealed
This was predominantly a flat area based on weathered blast furnace slag though it has been used for storage so there were mounds of tipped material. Vegetation cover was negligible.

Habitat Block 3. UK Habitats Classification: Sparsely Vegetated – Ruderal/ ephemeral
A flat area of weathered blast furnace slag. Bare ground was <10% so this could potentially be classed as "Other Neutral Grassland" rather than "Sparsely Vegetated – Ruderal/ephemeral" but the sward was quite sparse and the plant species present were more indicative of Ruderal/ephemeral habitats. Black medick *Medicago lupulina*, was frequent and both kidney vetch and viper's bugloss were occasional. There was no rank grass or scrub with the main grass species being red fescue *Festuca rubra*. Although the percentage of indicator herbs for this type of habitat was quite high, the diversity of them was relatively low, therefore the condition was assessed as being moderate.

Habitat Block 4. UK Habitats Classification: Modified Grassland
The substrate was presumed to be weathered blast furnace slag, as is the case with the majority of the application site however additional material may overlay that as grass cover was fairly rank in places There was a small amount of scatted scrub and a stand of bracken *Pteridium aquifolium*, the latter covering a few tens of square metres. The topography was mixed due to mounds of tipped material, which again were well vegetated. There was some variation across the area with some small pockets of more open areas with kidney vetch and viper's bugloss. Consequently the condition varied between poor and moderate therefore is assessed overall as being fairly poor.

Habitat Block 5. UK Habitats Classification: Sparsely Vegetated – Ruderal/ ephemeral
Similar to Habitat Block 3 except that the herb-species diversity was a little higher with bird's-foot trefoil *Lotus corniculatus*, and stonecrop, *Sedum sp*., being occasional. Nevertheless, although it was relatively herb-rich, it was still not species-rich for this type of habitat, so overall the condition was assessed as being moderate.

Habitat Block 6. Not applicable. This habitat block lies outside of the application site

Habitat Block 7. UK Habitats Classification: Sparsely Vegetated – Ruderal/ ephemeral
A flat, rectangular area on which the surface substrate was loosely compacted, dry soil, though presumably overlaying blast furnace slag. The amount of bare ground was around 5% but the sward was very open and the species composition more characteristic of "Sparsely Vegetated – Ruderal/ephemeral". Rank grass was absent and only a few isolated shrubs were present. Of indicator species for this type of habitat, black medick, viper's bugloss, hedge bedstraw *Galium molle*, bird's foot trefoil, kidney vetch, thyme-leaved sandwort *Arenaria serpyllifolia*, and hare's-foot clover *Trifolium arvense*, were all frequent. Several other indicator species were also present though less

frequently. This habitat block would meet the criteria for designation as a Local Wildlife Site under the "Urban Grassland" criterion [xv], therefore its condition is assessed as being good.

Habitat Block 8. UK Habitats Classification: Sparsely Vegetated – Ruderal/ ephemeral

This was another flat, rectangular plot with characteristics very similar to habitat block 7, except that it varied somewhat in the herb species composition. Hare's-foot clover and plantain species *Plantago spp*., are the principal elements of the vegetation but black medick, bird's-foot trefoil and yarrow *Achillea millefolium*, are all frequent and dove's-foot cranesbill *Geranium molle*, Ox-eye daisy, *Leucanthemum vulgare*, kidney vetch and yellowwort *Blackstonia perfoliata*, are occasional. Several other indicator species were also present. This habitat block would also meet the criteria for designation as a Local Wildlife Site under the "Urban Grassland" criterion [xv], therefore its condition is assessed as being good.

Habitat Block 9. UK Habitats Classification: Other Neutral Grassland
This was notably herb-rich grassland, with herbs comprising perhaps 90% of the sward. Bare ground was <5% and shrubs or invasive species were negligible. Hedge bedstraw and bird's-foot trefoil were the main components of the vegetation and both were abundant. Wild parsnip *Pastinaca sativa*, greater knapweed *Centauria scabiosa*, tufted vetch *Vicia cracca*, red clover *Trifolium pratense*, teasel *Dipsacus fullonum*, and restharrow *Ononis repens*, were all occasional. The presence of meadow clary *Salvia pratensis*, was particularly notable given its rarity in north east England. Despite the unusually high density of herbs, the sward did not appear to have the species composition required to meet the neutral grassland criteria for designation as a Local Wildlife Site , therefore its condition is classed as being fairly good. The extremely high proportion of herbs is suggestive of this habitat being derived from a wildflower seed mix as part of a landscaping scheme, to which weight is lent by it being surrounded by a perimeter of amenity shrub planting.

Habitat Block 10. UK Habitats Classification: Mixed scrub
This habitat block comprises mounds which surround habitat block 9. These were covered in scrub and semi-mature trees. That these were confined to the mounds suggests that they are the result of a landscaping scheme. The main species are sea buckthorn *Hippophae rhamnoides*, hawthorn, *Craetegus monogyna* and ash *Fraxinus excelsior*. Sea buckthorn is considered an invasive species in this context therefore the condition is classed as fairly poor.

Habitat Block 11. UK Habitats Classification: Modified Grassland
This is amenity grassland, part of which is regularly mown. There is the occasional herb, such as wild carrot but the sward is dense, not least as a result of the mowing and the habitat is therefore considered to be in poor condition.

Habitat Block 12. UK Habitats Classification: Modified Grassland
This habitat block was not surveyed as access was not possible at the time of the survey. However it has been viewed from the adjacent road to the south and it appears to be essentially the same as habitat block 4, from which it is separated by the width of the same road. Consequently it is assessed as being in the same condition (fairly poor).

Habitat Block 13. UK Habitats Classification: Artificial, unvegetated, unsealed
A large, flat expanse, seemingly used as an occasional laydown area. Vegetation was limited to a narrow strip of grass and scrub along the north and east perimeter totalling <0.2ha.

Figure 2. Habitat blocks

8. Assessment of baseline ecological conditions

Internationally designated sites

8.1 A Habitats Regulations Assessment ('HRA') has been completed for the proposed development, as set out under Regulation 63 of the Habitats Regulations 2017.

8.2 Stage 1 of a HRA involves screening to identify the potential for impacts to have likely significant effects. The following effects were identified at Stage 1 as having the potential to have a likely significant effect:

i. Loss of supporting habitat caused by the proposed development;
ii. Disturbance caused to waterbirds caused by the proposed development;
iii. Emissions to air caused by the proposed development; and
iv. Reduced groundwater infiltration caused by the development.

8.3 The HRA Stage 2 assessment (Appropriate Assessment) considers those potential impacts identified at Stage 1 and assesses whether there would be a likely significant effect from each. This assessment takes into consideration the embedded mitigation measures. The Stage 2 Appropriate Assessment concluded that, "the proposed development will not cause adverse effects to the integrity of the Teesmouth and Cleveland Coast SPA and Ramsar site, either alone or in combination with other plans or projects, provided that the embedded mitigation measures specified in the application are satisfactorily delivered."

8.4 As no additional mitigation is required beyond the embedded mitigation measures to mitigate the potential impacts identified in the HRA, the potential impact to these designated sites and their qualifying features will not be further assessed in this EcIA and reference should, instead, be made to the HRA.

Teesmouth & Cleveland Coast SSSI

8.5 The Teesmouth & Cleveland Coast SSSI underpins the SPA/Ramsar. Therefore it can be concluded on the basis of the HRA that there would be no adverse effect on those interest features of the SSSI that it shares with the SPA/Ramsar.

8.6 The SSSI includes some interest features and areas that are in addition to those of the SPA/ Ramsar. Those additional biological interest features that are within the 5km ZOI are; saltmarsh, sand dunes, harbour seal, the assemblage of breeding birds associated with wetlands and the invertebrate assemblage associated with sand dunes. Of these the closest are the sand dunes and their associated invertebrate assemblage, which is present on Coatham Dunes approximately 300m to the north and the breeding bird assemblage, part of which utilises a reedbed approximately 700m west of the site. Given the distances involved and the apparent lack of any hydrological connection between the site and the SSSI then the only potential effect would be via airborne contaminants.

8.7 Emissions to air have been identified by Natural England as having the potential for an adverse effect on the Teesmouth and Cleveland Coast SSSI. This is in terms of an increase in Nitrous Oxides (NOx) which would lead to eutrophication of certain habitats leading to increased vegetation growth. However the principal emissions to air from the proposed development would be dust and particulates generated by ground works rather than any significant increase in NOx. Dust and particulates could still have an adverse impact on the SSSI through the redistribution of any contaminants in the ground. A Construction and Environment Management Plan (CEMP) will be conditioned as part of the consent. This will include measures to limit the spread of dust and particulates to acceptable levels. Taking into consideration the mitigation that will be provided by the CEMP, it is assessed that there would be no adverse impact on site integrity from emissions to air on the Teesmouth and Cleveland Coast SSSI.

Locally Designated Sites

8.8 No pathways have been identified between the site and the interest features of the Eston Pumping Station LWS therefore it is concluded that there would be no adverse effects on Locally Designated Sites.

Species

Great Crested Newt

8.9 GCN is assessed as absent from the surrounding South Tees area, following extensive survey effort, and it is therefore considered to be absent from the site, with no realistic potential for it to colonise.

Bats

8.10 The development would result in the loss foraging habitat for widespread species of bats. The amount of habitat suitable for bats on the site is very small compared to the area of suitable habitat across Coatham Dunes and South Gare. Therefore the site is expected to provide a small part of the foraging habitat of a small number of bats, consequently the impact on the local bat population is considered to be low.

8.11 As pointed out in section 2.3 the buildings and other structures on the site do not form part of this application therefore their potential to support roosting bats in not assessed.

Reptiles

8.12 Two surveys have found reptiles to be absent other than for a few individual Common Lizards in a narrow strip along the northern boundary where it abuts the South Gare access road and opposite Coatham Dunes. This strip of land is separated from the remainder of the site by bare ground which would very likely create a barrier to common lizards dispersing across the site.

8.13 As part of a reptile mitigation strategy being developed to prevent harm to reptiles across Teesworks, the vegetation in the strip of land along the northern boundary was sprayed off in spring

and summer 2021. The reason for this was to encourage any common lizards that were present to move back onto Coatham Dunes. This appears to have been successful as no common lizards were found during several surveys in late summer 2021. Consequently the development is considered unlikely to have any impact on reptiles.

Breeding birds

8.14 The development would result in the loss of a small number of territories of ground nesting and shrub nesting birds. This would be likely to include little ringed plover, a Schedule 1 species and grey partridge, a Red List species. For little ringed plover, which nests on bare substrates, the impact would be temporary as the development would re-instate bare ground.

European hedgehog

8.15 The site is likely to form part of the home range of individual European hedgehogs. Given the open nature of much of the habitat on the site, the amount of suitable habitat is assessed as low and adverse impacts on the local population are considered to be negligible.

Brown hare

8.16 The site would appear to form part of the core home range of several brown hares. As such the development has the potential to have an adverse impact on brown hare at the Local scale.

Common toad

8.17 It is likely that a small proportion of the common toad population associated with the wider Teesworks site and the wetlands on Coatham Dunes would use the terrestrial habitat on the site. However, there are large areas of more suitable terrestrial habitats for common toads in the surrounding area so the impact of the development is assessed as negligible

Dingy skipper

8.18 The Ruderal/ephemeral habitat on the site provides suitable habitat for dingy skipper across several habitat blocks. Given the amount of suitable habitat it is assessed that the site supports a population of dingy skipper large enough to meet the relevant criterion for designation as a Local Wildlife Site (Tees Valley Local Nature Partnership, 2010) [xv].

Grayling

8.19 Given that in excess of 50 grayling have been counted on habitat block 7 and that similar habitat exists on habitat blocks 3 & 8 as well as potentially suitable habitat on habitat block 5, then the development is likely to result in the loss of a population of grayling of County importance.

Other invertebrates

8.20 The herb-rich nature of some of the habitat blocks should support good numbers of pollinating insects. However the compacted nature of much of the substrates would be likely to limit its use by burrowing insects. The lack of any specialist habitat features is likely to render the site of low suitability for other invertebrates of conservation importance.

Invasive Non-Native Species (INNS)

8.21 Although no INNS have been recorded, it is possible that scattered examples of certain Cotoneaster species that are listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) could be present.

Habitats

8.22 Two areas of "Sparsely vegetated-Ruderal/ephemeral habitat (habitat blocks 7 and 8) meet the "Urban Grasslands" criteria for designation as a Local Wildlife Site based on their diversity of plant species. Together these areas total 7.98 ha

8.23 Habitat blocks 3 and 9, although not quite meeting the respective criteria for Local Wildlife Site designation, are in fairly good condition and make a significant contribution to biodiversity in the context of the overall Teesworks area.

8.24 All other habitats on the site are poor to moderate examples of habitats that are widespread across the Teesworks site and across Teesside.

8.25 The Defra Biodiversity Metric 2.0 has been applied to the habitats on the site to calculate the total number of biodiversity units (BDUs) associated with the site. Across all habitats on the site there would be a total of **145.56** BDUs

9. Assessment of the impacts of the proposal

9.1 All habitats on the site would be lost as a result of the construction phase of the proposed development. Therefore the populations of all species on the site would be lost as a result of the loss of habitats.

9.2 The proposed development does not include the demolition of buildings or structures on the site therefore, there would be no effects on any species associated with the buildings.

Mitigation

9.3 A Construction and Environment Management Plan (CEMP) will be conditioned as part of the consent. . With regards to biodiversity and ecology the CEMP will include the following measures:

- Mitigation will be included to prevent and mitigate against any accidents, including but not limited to, spills, storage of soils and control of construction related dust;
- Removal of trees, scrub, wetland habitat or areas of grassland or other habitat that may support nesting birds should be undertaken outside of nesting season (March to August inclusive), unless the habitats are first checked by a suitably qualified ecologist, who confirms in writing to the LPA that no nesting birds are present; and
- Measures will be implemented to prevent the spread of invasive non-native plant species, as listed under either Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) or the Invasive Alien Species (Enforcement and Permitting) Order 2019.

9.4 As it is assumed that all habitats will be lost during the construction process, no other on-site mitigation is possible.

Residual effects.

9.5 With the mitigation in place the residual effects that are of greater than local significance are:

i. The loss of a sub-population of grayling butterfly of County importance;
ii. The loss of a sub-population of dingy skipper butterfly of County importance;
iii. The loss of an area of 7.98ha of "Sparsely vegetated land – Ruderal/ ephemeral habitat which meets the criteria for designation as a Local Wildlife Site; and

9.6 There would be a loss of habitats totalling 145.56 Biodiversity Units.

10. Recommendations

Compensation

10.1 Compensation refers to the process by which any residual effects after mitigation will be addressed. Compensation measures should be such that there will be no significant harm to biodiversity resulting from net loss of biodiversity in terms of the overall number of BDUs or to individual valued ecological receptors which would be considered significant.

10.2 Teesworks has prepared an Environment and Biodiversity Strategy that will guide future decisions by Teesworks as to the delivery of habitat enhancement schemes to off-set biodiversity loss resulting from its development and regeneration activities. This Strategy is an iterative process which quantifies all of the BDUs which will be lost as a result of development across the entire Teesworks area. It then calculates the number of BDUs that can be created in the Teesworks area including on land outside of the any areas proposed for development. The strategy also identifies any local, off-site habitat creation and enhancement measures that could be implemented, focusing primarily on the Tees estuary but potentially within the wider Tees catchment area if necessary. The Environment and Biodiversity Strategy provides options and opportunities for Teesworks, and those developing within the Teesworks area, to meet any biodiversity value deficit arising from development.

10.3 As set out in section 9.6, there will be a net loss of 145.56 BDUs as a result of the proposed development. The Environment and Biodiversity strategy in its current form, as submitted to the LPA, includes a figure of 151.90 BDUs as being lost to the NZT project. This assessment has refined the earlier calculations resulting in a reduction of 6.34 BDUs, which will be reflected in a future iteration of the Strategy.

10.4 As well as needing to compensate for the loss of the overall number of BDUs, like-for-like compensation will be required for the following;

i) a population of grayling butterfly of County significance;

ii) a population of dingy skipper butterfly of County significance;

iii) 7.98ha of “Sparsely vegetated- Ruderal/ephemeral” habitats meeting Local Wildlife Site designation criteria.

Biodiversity enhancement

10.5 Biodiversity enhancement refers to any measures that are taken which increase biodiversity value above the baseline conditions, either of the overall biodiversity value or for specific VERs. In ecological terms it is known as Biodiversity Net Gain (‘BNG’).

10.6 In planning terms, BNG is currently aspirational rather than mandatory. Nevertheless opportunities will be sought to provide enhancements through the Environment and Biodiversity Strategy.

10.7 The Defra BM2.0 metric makes quantitative comparisons between habitats however there is scope to make significant qualitative enhancements for biodiversity that go beyond the habitat comparisons. In particular, the opportunity to take a strategic approach to habitat creation and enhancement across the entire Teesworks area can provide a level of ecological connectivity and functionality for species which is greater than the current situation whereby species have colonised the Teesworks area in an opportunistic and often disconnected way.

Monitoring

10.8 Monitoring will be required to ensure that identified compensatory and, where relevant, enhancement measures have been achieved across an agreed timescale.

10.9 Monitoring will need to be in place for the duration of time that it is necessary to ensure that compensatory measures have achieved their objectives.

10.10 Monitoring will identify any measures that have not achieved, or are failing to achieve, their objectives and in such cases will provide remedial measures to address any shortfall.

10.11 The Environment and Biodiversity Strategy will include a management plan to provide the required compensation and, where possible, enhancement measures. The actions of the management plan will form the focus of the monitoring, with the monitoring schedule provided as part of the management plan.

11. Conclusion

11.1 Approximately 10ha of the site are of Local or County value, with the remainder assessed as low or negligible value.

11.2 In total, across all habitats on the site, the number of BDUs has been calculated as **145.56**. This has already been accounted for in the Teesworks Environment and Biodiversity Strategy.

11.3 The only Valued Ecological Receptors requiring specific compensatory measures are:

i) a population of Grayling butterfly of County significance;

ii) a population of Dingy Skipper butterfly of County significance;

iii) 7.98ha of "Sparsely vegetated- Ruderal/ephemeral" habitats meeting Local Wildlife Site designation criteria

11.4 The implementation of the Environment and Biodiversity Strategy will ensure that compensatory measures are provided such that there is no net loss of biodiversity arising from the proposed development.

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