

8 CHAPTER 8: ECOLOGY AND ORNITHOLOGY

8.1 Introduction

The Amended Proposed Development is described in Chapter 5 of this Environmental Statement Addendum (ESA). The amendments that would benefit ecology are listed below:

- The haul road and the conveyor to be extended progressively at a lower level through the created void behind the lagoon embankments as extraction commences easterly through Area A. An example cross-section of extraction activities is shown in Figure 5.2, ESA Volume 2. The embankments would act also as a screen reducing the risk of disturbance from noise, dust and visual sources.
- The removal of the semi-fixed Processing Areas and instead positioning mobile processing equipment (shredder, screen and conveyor hopper) close to the extraction face moving with each micro-phase, thereby removing the requirement for long haulage distances and associated potential for dust generation.
- The significant reduction of distances between the extraction face, screen, and conveyor hopper would confine dust generating operations within a small micro-phase (less than 1% of Area A at any given time) from which the PFA would be dug out and loaded directly onto a covered conveyor in close proximity. This would enable improved and simplified, better controlled dust management.
- The repositioning of the main conveyor further away from the Sutton and Lound Gravel Pits SSSI and the addition of an adjustable spur conveyor to move the reception hopper as close as possible to the extraction face within the void at a lower level and behind the lagoon embankments, rather than being more remote.
- The permanent retention of a large section of the lagoon embankment along the southern boundary of Area A, including where the Site overlaps with the SSSI, to avoid any direct impacts on the SSSI and to ensure a permanent buffer is retained. The bank would act also act as a permanent screen/buffer reducing the risk of disturbance from noise and visual sources.
- The wet working approach, including no pumping of groundwater from the extraction void and leaving some PFA in-situ to limit upwelling of water, would ensure there is no hydrological connection between the Site and the SSSI.
- The updated restoration would deliver a significantly greater area and diversity of valuable habitats that would continue to be delivered through a progressive restoration programme. The changes have resulted in an increased BNG of up to 43%, and importantly, include a commitment to 30-year aftercare.

This Chapter provides responses to comments from consultees, additional information to that presented in the Environmental Statement (ES) (submitted as part of the application in March 2023) and includes further survey findings and additional assessment, both of new features and to augment that provided previously. This chapter is supported by the following Technical Appendices (TAs) within Volume 3 of this ESA:

- TA 8.4: Updated Biodiversity Net Gain Assessment
- TA 8.7: Updated Habitat Data
- TA 8.8: Bat Roost Assessment
- TA 8.9: Invertebrate Habitat Assessment

8.2 Legislation, Policy and Guidance

As in the ES, the assessment follows prevailing CIEEM guidance which remains unchanged.

The supplementary bat roost surveys reported below were undertaken prior to the updated guidance published by the Bat Conservation Trust (BCT) in mid-September 2023 (Colins, 2023¹). As noted below, if the Amended Proposed Development is approved, further surveys would be undertaken and the bat surveys would take account of the updated guidance.

8.3 ES Assessment and Responses from Consultees

The ES reported a range of residual effects on biodiversity that were predicted to be not significant and in some cases of beneficial significance.

Constructive comments were received on the ES from Nottinghamshire County Council (NCC), Nottinghamshire Wildlife Trust (NWT) and Natural England (NE). A meeting was held with NCC and NWT on 29 June 2023 to discuss their responses to the application, as well as the revised working scheme, restoration plans and the benefits they incorporated for biodiversity. This chapter addresses the matters listed below:

- Specific clarifications about the bat and reptile ES figures and surveys / findings (see Section 8.4);
- Revised project phasing; (see Section 8.5);
- Effects on water levels in the Sutton and Lound Gravel Pits Site of Special Scientific Interest (SSSI), and Sutton and Lound Local Wildlife Site (LWS) (see Section 8.6);
- Baseline survey validity (see Section 8.7);
- Loss of land within the SSSI and LWS (see Section 8.9.1);
- Elements of the assessment, for example consideration of barn owl and turtle dove (see Section 8.8); and
- Restoration (see Section 8.9).

8.4 Clarification on Bat and Reptile Information in the ES

The bat survey results figure has been updated. Figure 8.5, in the ESA Volume 2, shows the full results from the transect surveys and supersedes Figure 1 in Technical Appendix 8.1 in Volume 3 of the ES. Overall, the results show a similar pattern of occurrence, with concentration of records around the Site boundaries close to more mature vegetation.

Figure 8.6, in the ESA Volume 2, shows the reptile survey area which included all habitats potentially suitable for reptiles. These were principally around the Site boundaries and excluded areas of grazed pasture. Individual refugia locations were not recorded; however, they were spread through potential habitat at a density commensurate with the survey method.

8.5 Revised Project Phasing

Table 8.1 is a revised version of Table 8.11 presented in the ES. It provides a summary of sensitivities, updated to account for the new survey data, changing order of the Proposed Development, and the revised naming of the Individual Phases

¹ Collins J (ed) (2023) Bat Surveys for Professional Ecologists. Good Practice Guidelines (4th Edition) The Bat Conservation Trust, London.

Table 8.1: Revised summary of ecological sensitivities per phase

Phase	Habitats Summary	Ecological Features Present
Infrastructure Including the haul route, conveyor and Main Processing Area in Areas B and C.	Haul Road and conveyor – primarily runs through areas of bare ground and arable farmland, with some vegetation, hedgerow and/or tree removal at field boundaries.	<ul style="list-style-type: none"> • Bats (foraging) • Birds (breeding) • Reptiles (grass snake) • SSSI (adjacent to south)
HR P1	Predominately improved grassland with plantation broad-leaved woodland at the eastern and western boundary, and a bare ground access track. Large brash pile at the south-eastern corner of the improved grassland field.	<ul style="list-style-type: none"> • Bats (foraging) • Birds (breeding) • Reptiles (grass snake) • SSSI (adjacent to south)
LR P1	Improved grassland.	<ul style="list-style-type: none"> • Bats (foraging) • Birds (breeding) • Botany (bee orchids recorded within woodland adjacent) • SSSI (adjacent to southwest)
LR P2	Predominately improved grassland with limited area of plantation broad-leaved woodland at the southern boundary.	<ul style="list-style-type: none"> • Birds (breeding) • SSSI (adjacent to south and west)
HR P2 (Formerly HR P6)	Predominately improved grassland with plantation broad-leaved woodland at the east and west boundary, with a bare ground access track.	<ul style="list-style-type: none"> • Birds (breeding) • Reptiles (present) • SSSI (adjacent to east/south, including strip of SSSI within the phase boundary)
HR P3 (Formerly HR P5)	Predominately improved grassland with plantation broad-leaved woodland at the north, east and west boundary and a limited area of dense scrub at the north-west boundary, with a bare ground access track.	<ul style="list-style-type: none"> • Bats (foraging) • Reptiles (present) • SSSI (adjacent to east)
HR P4	Predominately improved grassland with plantation broad-leaved woodland at all boundaries, and a limited area of dense scrub at the west boundary, with a bare ground access track. South facing embankment within area of woodland at the south-east boundary.	<ul style="list-style-type: none"> • Bats (foraging) • Birds (breeding) • Reptiles (present) • SSSI (adjacent to south)
HR P5 (Formerly HR P3)	Mixture of habitats, comprising improved grassland, poor semi-improved grassland, and plantation broad-leaved woodland, with species-poor hedgerow, scattered scrub and scattered coniferous trees towards the north boundary.	<ul style="list-style-type: none"> • Bats (foraging) • Birds (breeding) • SSSI (adjacent to southeast)
HR P5 (Formerly HR P2)	Mixture of habitats (although grassland predominant), comprising improved grassland, poor semi-improved grassland, dense scrub, and plantation broad-leaved woodland, with species-poor hedgerow, scattered	<ul style="list-style-type: none"> • Bats (foraging and potential roosting) • Birds (breeding, Schedule 1 species potential)

Phase	Habitats Summary	Ecological Features Present
	scrub and scattered coniferous trees towards the north-west boundary. Log and brash piles, large soil/manure mound present, along with a bare ground access track.	<ul style="list-style-type: none"> • Botany (bee orchids and pyramid orchids present) • SSSI (c.70 m southwest)
Soil Store Including an area of land in the north excluded from the other phases. To the east of HR P6.	North – Improved grassland with limited area of bare ground access track. South – Mixture of habitats, comprising recently felled broad-leaved woodland, plantation broad-leaved woodland and arable land.	<ul style="list-style-type: none"> • Bats (foraging) • SSSI (c.320 m south)
LR P3	Improved grassland.	<ul style="list-style-type: none"> • Bats (foraging) • Birds (breeding) • Botany (bee orchids recorded within adjacent woodland) • SSSI (c.330 m east)
LR P4	Improved grassland with bare ground access track.	<ul style="list-style-type: none"> • Bats (foraging) • Birds (breeding, wintering) • Botany (bee orchids recorded within adjacent woodland) • SSSI (c.260 m southeast)
LR P5	Improved grassland with bare ground access track.	<ul style="list-style-type: none"> • Bats (foraging) • Birds (breeding, wintering) • Reptiles (grass snake adjacent) • SSSI (c.400 m southeast)

The Phase name changes also changes the following information presented:

- The changes in Table 8.1 also apply to the equivalent table in Technical Appendix 8.2: *Badger Annex [Confidential]*, submitted as part of the ES (Vol 3, TA 8.2, page 6). This has not been reproduced due to the confidential nature of the data, but the changes to the naming of HR P2, HR P3, HR P5, and HR P6, are applicable. Similarly, the haul road is not built through the entirety of the Site initially but is extended sequentially as extraction progresses in line with the amended working scheme.
- In Table 8.14 (*Assessment of Potential Effects*) in the ES. In reference to the assessment on bittern, “Phases HR P4–P6” (Vol. 1, page 8-55) should now read: “Phases HR P2–P4”.

8.6 Effects on Water Levels in the Sutton and Lound Gravel Pits SSSI, Sutton and Lound LWS

There would be no effects on adjacent waterbodies in the SSSI or the LWS due to the Amended Proposed Development, as described in Chapter 9 of this ESA (Hydrology). The retention of some PFA in the base of the excavation and the wet working proposals, including no pumped dewatering of the extraction void, ensures that there would be no hydraulic connection with either the SSSI, or the LWS. Details of the monitoring that would occur are described in Chapter 9 of this ESA.

8.7 Age of Survey Findings Collated for the ES

Baseline surveys were completed between February 2021 and November 2022, to inform the ES. For survey findings that are between 18 months and 3 years old, CIEEM Guidance (2019) states:

“A professional ecologist will need to undertake a site visit and may also need to update desk study information (effectively updating the Preliminary Ecological Appraisal) and then review the validity of the report, based on the factors listed below. Some or all of the other ecological surveys may need to be updated. The professional ecologist will need to issue a clear statement, with appropriate justification, on:

- *The validity of the report;*
- *Which, if any, of the surveys need to be updated; and*
- *The appropriate scope, timing and methods for the update survey(s).*

The likelihood of surveys needing to be updated increases with time and is greater for mobile species or in circumstances where the habitat or its management has changed significantly since the surveys were undertaken. Factors to be considered include (but are not limited to):

- *Whether the site supports, or may support, a mobile species which could have moved on to site, or changed its distribution within a site (see scenario 1&2 examples);*
- *Whether there have been significant changes to the habitats present (and/or the ecological conditions/functions/ecosystem functioning upon which they are dependent) since the surveys were undertaken, including through changes to site management (see scenario 3 example);*
- *Whether the local distribution of a species in the wider area around a site has changed (or knowledge of it increased), increasing the likelihood of its presence.”*

Based on the above, Table 8.2 contains a review of the dates of surveys undertaken to date and assesses the need for any to be updated.

An Outline Monitoring and Mitigation Plan (OMMP) was submitted as part of the ES (Vol. 3, TA 8.6). The aim of the document was to provide a framework for ensuring surveys were updated at appropriate intervals to update the baseline condition and ensure proposed mitigation remains suitable and proportionate. As such, it is anticipated that surveys would be repeated post approval, but prior to work commencing.

It is expected that the OMMP would be revised post consent to offer greater certainty in its effectiveness to detect any changes in the baseline. Based on comments received on the planning application, we offer here the following clarifications and commitments:

- The OMMP would be revised where necessary to maintain compliance with prevailing legislation and best practice at the time;
- The OMMP would be updated to reflect the latest survey results (i.e. to reduce the frequency of invertebrate assessment), and changes in the working scheme; and
- Once revised, the OMMP would be agreed with NCC. Any future changes would be agreed with a steering group as below.

A steering group would be established to provide comment on ecological elements as the Amended Proposed Development progresses, ensuring the mitigation and restoration maintain their stated aims. The group would meet prior to the establishment phase of the Amended Proposed Development and agree a scope for future meetings based on the expected programme of works.

Representatives from the following parties would be invited to join the group:

- The developer;
- The landowner;

- The project ecologist and/or Ecological Clerk of Works (ECoW);
- The restoration contractor;
- Nottinghamshire County Council;
- Nottinghamshire Wildlife Trust; and
- Natural England.

Table 8.2: Ecology Survey Details

Survey	Baseline Survey Dates	Time since last survey (approx. to December 2023)	Comments on Age of Survey and Need for Updates
Habitats	<ul style="list-style-type: none"> ▪ February 2021, updated August 2021 ▪ June 2023 	6 months	Given the age of the previous Phase 1 Habitat Survey, new habitat survey data was collected in June 2023 as part of an updated PEA. The survey used the UK Hab method to enable better integration of the findings with the Natural England metric used in the assessment of BNG.
Badger	<ul style="list-style-type: none"> ▪ February and April 2021 ▪ January and November 2022. ▪ June 2023 	6 months	As part of the updated Preliminary Ecology Assessment (PEA), checks of known badger features were completed, where accessible, along with a search for new signs. Searches were restricted in some areas by dense vegetation, but no changes from previous surveys were identified.
Breeding Birds	<ul style="list-style-type: none"> ▪ March to July 2021 	29 months	The breeding bird qualifying interests of the SSSI and LWS are species associated with wetland habitats, none of which were recorded breeding in the Site. The majority of the other breeding bird species occur in boundary habitats that have remained unchanged over recent years. Repeating the surveys would be highly unlikely to change the proposed monitoring and mitigation for the project. Additional information was obtained on barn owl and turtle dove and this has been incorporated into the updated assessment.
Winter Birds	<ul style="list-style-type: none"> ▪ October 2020 to March 2021. ▪ Additional visits in February 2022 in response to rainfall. 	22 months	The main qualifying interests of the SSSI / LWS are passage and wintering wildfowl species that don't occur on the Site in important numbers. The extent of flooding and standing water can vary between years, however, this makes little difference given the extent of open water already in the surrounding area. No effects are likely in the early stages of the Amended Proposed Development as habitats near the Site are unsuitable for important waterbird aggregations and are not part of the SSSI. As such, updating surveys would not change the proposed monitoring and mitigation.
Reptiles	<ul style="list-style-type: none"> ▪ May to July 2021 	29 months	The majority of suitable habitats are scattered around the periphery of the Site and have remained largely the same. As such, repeating the surveys would not change the proposed monitoring and mitigation for the Amended Proposed Development.

Bat Activity Surveys	<ul style="list-style-type: none"> ▪ April to October 2021 	26 months	Bats were recorded close to boundary features and in most cases, commuting routes would be maintained as adjacent habitat edge would be retained. Repeating the surveys would not change the proposed monitoring and mitigation for the amended Proposed Development.
Bat Roost Assessment	<ul style="list-style-type: none"> ▪ Initial assessment, November 2022 ▪ Physical inspections in July – August 2023 	4 months	Inspections of potential roost features were completed in July-August 2023 following on from the initial assessment. Dawn / dusk surveys are required for one tree assessed as of moderate potential, where physical inspections were not possible.
Water Vole and Otter	<ul style="list-style-type: none"> ▪ June and August 2021 	28 months	<p>Habitats and suitability were reviewed as part of the UK Hab survey and have not changed since the baseline surveys. Suitability in the early phases of the Amended Proposed Development is negligible and updating detailed surveys at this stage would not change the proposed monitoring, or mitigation.</p> <p>Water vole are considered likely to be extirpated from the local area due to pressure from mink (Nottinghamshire Wildlife Trust, per comm.)</p>
GCN	<ul style="list-style-type: none"> ▪ eDNA, April 2021 	32 months	All waterbodies assessed were scoped out on HSI score, or negative eDNA findings. Repeating surveys at this stage would not change the proposed mitigation.
Invertebrates	<ul style="list-style-type: none"> ▪ Initial assessment, November 2022 ▪ Focused Site walkover in August and October 2023 	2 months	Habitat on Site was not considered suitable to support a notable assemblage of species of importance due to the current grazing of grassland habitats, age and nature of woodland the woodland planting and lack of important features for invertebrates, such as dead wood. No further surveys were considered necessary.

8.8 Updated Survey Findings

8.8.1 Habitats

The habitats recorded during the survey in June 2023 were broadly the same as during the previous surveys in February and August 2021, although habitat categories were changed slightly to reflect the use of the UKHab classification. The timing of the visit, in June, allowed a greater floristic diversity to be recorded in some habitat types and some amendments were made to boundaries / habitat type that reflected agricultural rotation, changes in the composition of woodland and scrub and the re-evaluation of an area along the western boundary previously recorded as grassland and scrub, as parkland and scattered trees. The condition of habitats recorded during the June 2023 survey ranged from good to poor, however, the majority were moderate or poor. Further details, including an updated habitat map are provided in Volume 3 of this Addendum in TA 8.7.

8.8.1.1 Area A

The habitats in the survey area comprised mainly grazed fields of modified grassland and species poor other neutral grassland. Woodland was largely other broadleaved plantation adjoining the fields around the margins of Area A, with occasional areas of coniferous plantation. In places it was interspaced by scrub in the central section of Area A. In many places the field boundaries across Area A comprised fence lines, with two woodland belts separating the grassland fields in the centre of the Site. There was also a single intact, but species poor hedgerow, to the south of Lound Low Road, in the north of Area A. A ditch, with low flow and that appeared turbid, followed the northern edge of Area A in a strip of broadleaved woodland and a pond surrounded by willow trees with marginal and emergent vegetation, was present to the south of Lound Low Road, immediately north of Area A.

8.8.1.2 Areas B and C

In the proposed main processing and conveyor / link road areas, the habitats remained more mixed and included crop fields separated by two species poor, gappy thorn hedgerows, more urban category habitats, areas of broadleaved and coniferous woodland and modified grassland along the access track. Two ditches were recorded, one crossing Area B and one crossing Area C. Both had low flow and supported dense stands of Himalayan balsam along the banks. A Japanese knotweed bush was recorded.

Specific focus was given to an area of land in the southern part of Area B, to determine if it comprised open mosaic habitat (OMH). Survey in this location confirmed the area was mostly cleared (bare earth) and remained an active works area for storage and dismantling of articulated lorry trailers (see Image 8.1 below and Photographs Volume 3 of this Addendum TA 8.9). Based on a review of historical imagery, the area was apparently cleared between September 2020 and the initial baseline surveys, which at that time classed the area as bare ground.

Although much of the area is in current use and not OMH, some of the edges have spoil heaps which are presumably retained from the area that was cleared. These have started to revegetate and do show some initial features of OMH, albeit in a very spatially restricted area and still subject to change due to the current use that is outside the Applicant's control.



Image 8.1 – Active Works / Storage in Area B

8.8.2 Badgers

Based on checks undertaken alongside the habitat surveys, the findings from previous surveys had not changed.

8.8.3 Bats

Trees identified as having potential roost sites for bats were climbed in August 2023 and any potential roost features (PRF) investigated by a licenced bat worker. No signs of bats were found in any of the potential roosts assessed. Further details are provided in Volume 2, TA 8.2. One tree with moderate roost potential was not climbed due to health and safety concerns and has not been surveyed. This is considered further within the assessment.

Potential bat roost features outside the Site boundary have not been inspected. This would be reviewed initially when further surveys are undertaken and monitored on a phase-by-phase basis, to confirm suitable controls are in place if necessary.

8.8.4 Invertebrates

An Invertebrate Habitat Potential (IHP) Assessment was undertaken that identified two areas with potential value to invertebrates. In such instances, the IHP assessment guidance offers two potential pathways that may be followed as listed below.

- *An entomologist should be consulted who will be able to review the IHP assessment and develop a scope of appropriate survey that targets relevant invertebrate assemblages or taxa with reference to industry guidance.*
- *The outcomes of IHP assessment can be utilised to help avoid or sustainably mitigate the impact of a development on key habitat elements, and therefore scope out the requirement for dedicated invertebrate survey in those instances.*

As such, a review of the Site by an invertebrate specialist was commissioned. The specialist reviewed the available information and completed a walkover (in August and October 2023), and considered the Site to be of low value to native invertebrates for a range of reasons (e.g. intensive sheep grazing, lack of hedgerows, young densely planted tree belts, general absence of dead and decaying wood, absence of mature trees/ancient woodland, absence of wetland habitat, presence of non-native conifers) and advised no further surveys were considered necessary. Further details are provided in Volume 3 of this Addendum, in TA 8.9.

8.8.5 Other Protected Species

Overall, the Site's suitability to support protected species was largely unchanged since the previous baseline surveys. The 2023 bat roost assessment survey did find evidence that barn owl had nested on the Site.

8.9 Updated Assessment of Effects

8.9.1 Effects on Designated Sites

The assessment submitted with the planning application reported the loss of 1.47 ha (0.46%) of the SSSI where the southern boundary of Area A overlapped the SSSI. The revised working scheme avoids lowering this embankment as part of the restoration proposals, thereby avoiding the direct loss of any land from the SSSI (see Figure 7.18 in Chapter 7 of this ESA and Figure 8.1 in Volume 2 of the ES).

This change also reduces the direct effects on the Sutton and Lound LWS in Area A, avoiding loss of the bank where the LWS and SSSI shares the same boundary, overlapping with the southern boundary of Area A. The retention of this area of the SSSI/LWS as part of the Amended Proposed Development would reduce the effects on the habitat and the fauna species they support, such as birds, bats, badgers and reptiles.

Some loss of the LWS within Area A is still required to recover the necessary infill material to minimise areas of open water and achieve the proposed restoration landform. Excluding land shared with the SSSI designation, approximately 3.41 ha of the LWS overlaps with the site boundary, equating to approximately 0.7% of the 512 ha LWS. The LWS located along the western boundaries of HR P2 and HR P3 would be mostly lost. There would be some further loss to facilitate the haul road/conveyor route where the LWS overlaps Area B, in the southwest of the Site (see Figure 8.4 in Volume 2 of this ESA). As the LWS spans the full width of Area B in this location, it is impossible to avoid this, but loss would be minimised (see Site Layout Plans, in Volume 3 of this ESA, TA 5.1). Construction would be micro-sited with the on-site Ecological Clerk of Works (ECoW), to minimise any loss of specific features (e.g. mature trees). Overall loss of the LWS would likely be less than 2.5 ha (<0.5 %).

The small areas of LWS that would be lost primarily comprise of mixed plantation woodland and species-poor neutral grassland. This habitat type would be used by the bat species that contribute to the qualifying interest of the LWS, based on a review of species criteria for LWS². However, trees and hedgerows in some of these locations would be retained where possible, to maintain commuting corridors for bats (and other wildlife) whilst the new planting matures, as shown in Figure 7.18 (see Chapter 7 of this ESA). Compensation for this habitat loss would be delivered through the restoration, including the creation of diverse, high-value habitats to replace and improve the value for bats in the long-term. Creation of such habitat would be made possible through the provision of valuable restoration material from the embankment that facilitates the proposed restoration landform, including avoiding a need for further areas of open water.

No significant effects would occur to qualifying interest features in the SSSI/LWS nearby. Further assessment regarding air quality and dust are contained in Chapter 13 (Air Quality) of this ESA.

² ([PART 2 – BIOLOGICAL SINC SELECTION CRITERIA \(nottinghamcity.gov.uk\)](#))

Effects on other designated sites remain unchanged from those described in the ES.

8.9.2 Effects on Habitats

The assessment remains as described in the ES. Further consideration was given to an area in Area B (see Image 8.1 above) that is still an active work area, used for storage and deconstruction of lorries. The majority of the area is clear of vegetation, but with habitats around the margins that contain some OMH features. However, these features are insufficient for it to constitute OMH. In any event, the haul road and conveyor route would be sited on disturbed / active works areas that do not support these habitats. Given the phased approach, the marginal habitats in these areas would be monitored prior to any effects occurring, to determine if further OMH features establish and any mitigation measures that are required.

The phased nature of extraction and restoration may provide opportunities to retain some habitat features through translocation, helping to maintain mycorrhizal communities and reduce delays between habitat loss and maturation of restored habitats. For example, where timing coincides, grassland cleared as part of embankment removal could be transplanted into a previous phase as part of the restoration. The feasibility of such measures would be reviewed as the project progresses, to identify opportunities and draw on available evidence on best practices to maximise success.

8.9.3 Effects on Species

8.9.3.1 Birds

Since the ES, information has been obtained on two bird species on / adjacent to the Site, Evidence of barn owl was obtained by surveys for the Amended Proposed Development that involved checking a barn owl nest box in Area A, to see if it was used by roosting bats. In addition, consultations with NCC and NWT highlighted the presence of turtle doves in the Idle Valley Nature Reserve.

8.9.3.1.1 Barn Owl

At the time of the ES submission there was no evidence of nesting by barn owl in the barn owl nestbox in Area A, with surveys showing occupancy by stock dove. The box was inspected during a bat roost assessment survey in 2023, which identified evidence of recent (2023) breeding. Barn owl is not a conservation priority and is considered a feature of less than local importance; however, is assessed here due to its status as a Schedule 1-listed species on the Wildlife and Countryside Act, 1981 (as amended), and is therefore subject to legal protection from disturbance when nesting.

Given the nest location on the Site, between phases HR P6 and LR P3, it would be necessary to relocate the box to avoid disturbance to nesting barn owl during the works. It is proposed that suitable locations for two nestboxes (a new one and the relocation/replacement of the one used in 2023) and timescales for installation would be informed by review of the construction programme and further monitoring surveys post consent, and agreed with the steering group (see section 8.7). Locations may be on site, in areas already restored, and/or nearby offsite, subject to landowner consent. Prior to the removal of the existing nestbox, measures would be taken to avoid effects on any birds through monitoring to identify breeding/roosting status and, when necessary, maintaining a buffer of up to 175 m where some activities would be restricted to avoid disturbance to barn owl³.

It is considered likely that, at present, the birds primarily forage off-site given the limited opportunities from the existing on-site habitat with large areas of modified grassland. The Amended Proposed Development includes restoration proposals that would create areas of new foraging habitat for barn owls on the Site. Over half of the restored area in Area A (approximately 58 ha) would comprise species rich and wet grassland, and there are additional ditch margins, all of which would improve foraging significantly for barn owls. The phased approach and progressive nature of the restoration

³ Goodship N M & Furness R W (2022) Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species. NatureScot Research Report 1283

would allow also for some of the new grassland areas to become established before the current nest site is lost and allow increased foraging opportunities to commence at a much earlier stage in the Amended Proposed Development.

Light spill from the Amended Proposed Development would be controlled to minimise potential effects on foraging and nesting barn owl. For example, all artificial lighting would be angled downwards and into the site/works area and be spatially limited / focussed on active works/processing areas to avoid effects on wider habitats. When the day lengths are shorter, some lighting would be required to allow extraction work to take place throughout the proposed 7 am to 7 pm working period. Lighting would be focused on the active works area(s), for example using two mobile lighting towers, each typically up to 7 m tall. Security lighting would be motion-sensitive and restricted to works areas, or site infrastructure. A proposed lighting strategy, full details of which would be secured by a suitable planning condition, would set out measures to direct and control any lighting required to avoid significant effects, not only on barn owls, but also on other sensitive nocturnal species, such as bats and badgers.

8.9.3.1.2 Turtle Dove

NWT is actively working to enhance the adjacent Idle Valley Nature Reserve for turtle dove and two turtle doves were recorded in song on/near the southern boundary of the Site in June by NCC (pers comm Nick Crouch, 2023). Given the rarity of this species in the county and the recent population declines across the UK and Europe, it is considered as a feature of regional importance.

As a migrant species, potential effects on turtle dove are seasonal and restricted to the summer, from approximately April to August. Currently the Site is suboptimal, providing some potential nesting opportunities in the scrub and woodland along the boundaries, but little foraging resource due to the lack of seed-bearing grassy and ruderal species. Potential effects, therefore, are most likely to birds on the margins of or beyond the Site boundary from noise and/or visual disturbance.

Retention of parts of the southern boundary, i.e. the aforementioned SSSI embankment, would minimise direct habitat losses. In addition, retention of embankments during extraction in each phase would reduce the potential for indirect effects such as disturbance, with the retained embankments providing screening of the extraction works within the Site. Note that the SSSI embankment would be retained permanently, with other embankment only removed to facilitate restoration of each phase when extraction is completed.

Other measures that would be implemented to avoid significant effects on turtle doves would be restrictions to some activities that could potentially generate higher levels of noise / visual disturbance, such as soil stripping, during late-April and early-May, when turtle doves are establishing territories.

Annual surveys could be undertaken during the lifetime of the amended Proposed Development to confirm if turtle doves are present, their locations and any signs of successful breeding. It is proposed that this would comprise six visits between late-April and mid-June, focusing on suitable habitat within the Site and a 200 m buffer. Surveys would be completed within three hours of sunrise, when turtle doves are most active, and map all encounters with the species to determine likely territories and habitat use. It is proposed that these surveys and other specific measures to protect turtle dove could be formalised through a suitable planning condition for a 'Turtle Dove Management Plan' or similar.

8.9.3.2 Bats

None of the features inspected were confirmed to be bat roosts or showed any evidence of use by bats.

One feature was not inspected as the tree (Tree 13) was not safe to climb (as described in Volume 3 of this ESA, in TA 8.8), therefore it is unknown whether it is currently used as a bat roost and a reassessment of the tree maintained the moderate potential. The tree is located in the southwest of Area B, adjacent to the proposed route of the haul road. The tree would be avoided and retained,

therefore there would not be a loss of a potential roost. If used by bats, there is potential for indirect effects caused by use of the nearby haul road, such as noise or dust. Such effects are possible to mitigate, and a survey (dusk/dawn watch, rather than physical inspection) during the appropriate season would determine the requirement for and scope of, any mitigation.

As per the assessment for barn owl, artificial lighting in Area A would be spatially restricted, limited in duration of use and directed to avoid light spill. In Area B (Main Processing Site), an area where bats may also forage, the same method and principle would be used with mobile lighting towers directing light on any works area, angled to avoid surrounding habitats.

The monitoring and mitigation plan provides a framework for reviewing habitats ahead of works on each phase (or group of phases) to identify PRFs and any use by bats. Any future changes in baseline would be subject to appropriate mitigation.

8.9.3.3 Invertebrates

The Site is not considered to support any notable species of importance and appeared to be of low value to native invertebrates. Effects on invertebrates would be not significant and the restoration proposals would create new habitat that would enhance the Site for invertebrates in the future.

8.9.3.4 Reptiles

Overall, the assessment of potential effects on reptiles remains unchanged from the ES; however, a minor change to restoration is proposed to avoid effects on potential reptile habitat. The land areas being retained are shown on Figure 7.18 in Chapter 7 of this ESA, and the advance planting of trees adjacent would be brought into the Site to minimise effects on reptile habitat.

8.9.4 Potential Effects of Noise

Baseline noise measurement data are presented in Chapter 12 (Noise) of this ESA. The data has been used here to inform assessment of potential effects of the Amended Proposed Development on ecological receptors.

Notwithstanding the improvements that have been made to the working method, it is acknowledged that there is still the potential for ecology features, particularly birds, to be affected by noise generated by the Amended Proposed Development. To assess the likelihood of significant effects on features of importance in the surrounding designations (Sutton and Lound Gravel Pits SSSI and Sutton and Lound LWS) consideration has been given to background levels and how the predicted levels compare. In addition, a maximum noise level of 55 dB $L_{Aeq, 1 \text{ hr}}$ (free-field)⁴, has been used as a reference threshold based on published review of the effects of noise on passage / wintering wetland bird species on intertidal areas⁵ including a number of those known to use the SSSI. Noise of less than 55 dB (at the location of a receptor) is considered as a low-level disturbance stimulus and unlikely to cause a significant negative response.

This is a noise level at which no effect was observed rather than the onset of noise disturbance for birds, and therefore is inherently precautionary. The units in which this noise level was measured are not stated, however for this assessment they have been interpreted as $L_{Aeq, 1 \text{ hr}}$ as this is the noise parameter which reflects the higher noise levels occurring during the day from mechanical plant associated with the Project. The L_{Aeq} parameter is the only noise index for which a British Standard prediction method is available for construction plant and this parameter tends to reflect the higher noise levels in a time varying signal compared to other noise indices. The predicted noise levels also

⁴ Unless stated otherwise, noise levels in this assessment refer to $L_{Aeq, 1 \text{ hour}}$ (free-field), i.e. average noise levels over one hour, away from reflecting surfaces.

⁵ Cutts N, Hemingway K & Spencer J (2013) Waterbird Disturbance Mitigation Toolkit Informing Estuarine Planning & Construction Projects (Version 3.2), University of Hull.

focus on a 1 hour period ($L_{Aeq, 1hr}$) to reflect the times when activity will be highest. It is understood this noise threshold is consistent with that used at comparable developments within the county.

Due to the mobile nature of many ecological interests and interannual variation in presence and habitat use, additional receptor locations (Noise Sensitive Receptors / NSRs) were identified to act as a proxy for ecological features. Baseline noise levels were measured at these locations, and predicted noise emissions modelled to help assess potential effects. Some of the receptor locations were located within the SSSI, including some of those used in the ES, with further locations added on the boundary of the Site (i.e. at the closest points of the SSSI), to act as a worst-case scenario for effects within the designated sites.

With the exception of noise measurement location ST2 (see Figure 12.16 in Chapter 12 of this ESA), where a L_{AFmax} level of 49 dB was recorded on one occasion, existing maximum levels recorded at the boundary of the SSSI were found to exceed 55 dB, with a level of 88 dB L_{AFmax} recorded during one survey. Noise sources varied with location and included many "natural" noises, such as birdsong or rustling leaves, that would not affect birds, or help build habituation to potential noise stimuli as a result of the Amended Proposed Development. Anthropogenic sources of noise included passing lorries and trains, industrial noise, farming activities, walkers and model aircraft.

Chapter 12 of this ESA includes updated modelling scenarios for the Amended Proposed Development at the NSRs. This covers the main extraction works themselves, along with short-term operations such as dig-down (part of site establishment works), soil stripping and embankment removal to facilitate restoration. The main extraction works are not predicted to exceed 55 dB due to the revised working method, which reduces and moves the potential sources of noise, and retention of parts of the southern embankment which offers noise screening properties. The only exceedances of the threshold relate to short-term dig-down, soil stripping, and embankment removal, and range from 56 to 67 dB, and are shown in Table 8.3, including reference to relevant contour figures available in Volume 2 of this ESA. In terms of timescales for these short-term activities, in HR P2 there would be 11 days of soil stripping spread over 3.1 years; meaning an average of less than 4 days total per year for this activity.

Table 8.3: Noise scenarios exceeding 55 dB (L_{Aeq}, 1 hour)

Activity	Location	NSR	Predicted Noise (dB)	Contour Figure	Estimated Activity Duration	Activity / Feature notes
Soil Stripping	HR P2	8 (River Idle Footpath)	56	Fig 12.19	11 days over 3.1 years	Works very limited in duration and occurring irregularly.
Dig-down	HR P1	11 (Additional SSSI 1)	57	Fig 12.30	3-5 days of the 3.1 year	Receptor is a wooded area of the SSSI with no interest features nearby.
Soil Stripping	HR P1	11 (Additional SSSI 1)	65	Fig 12.18	12 days over 3.1 years.	Receptor is a wooded area of the SSSI with no interest features nearby.
Embankment Removal	HR P1	11 (Additional SSSI 1)	63	Fig 12.33	15 days of the 3.1 years	Receptor is a wooded area of the SSSI with no interest features nearby.
Soil Stripping	HR P2	12 (Additional SSSI 2)	61	Fig 12.19	11 days over 3.1 years	Works very limited in duration and occurring irregularly.
Soil Stripping	HR P3	13 (Additional SSSI 3)	65	Fig 12.20	11 days over 3.7 years	Works very limited in duration and occurring irregularly.
Soil Stripping	LR P1	14 (Additional SSSI 4)	58	Fig 12.24	6 days over 0.3 years.	Modelled point is not at the edge of the phase, so noise is likely to be louder when activity occurs closer to the Site boundary. Based on modelling elsewhere on the Site in similar situations (e.g. LR P2, below), levels would not exceed 65 dB.
Embankment Removal	LR P1	14 (Additional SSSI 4)	56	Fig 12.39	5 days of the 0.3 years	Predicted noise <50 dB at lake where waterbird features occur.
Soil Stripping	LR P2	14 (Additional SSSI 4)	65	Fig 12.25	5 days over 0.4 years.	Works very limited in duration and occurring irregularly.
Embankment Removal	LR P2	14 (Additional SSSI 4)	60	Fig 12.40	5 days of the 0.4 years	
Soil Stripping	LR P3	15 (Additional SSSI 5)	56	Fig 12.26	11 days over 0.7 years.	Predicted noise <50 dB at lake where waterbird features occur.
Embankment Removal	LR P3	15 (Additional SSSI 5)	55	Fig 12.41	8 days of the 0.7 years	Predicted noise <50 dB at lake where waterbird features occur.
Soil Stripping	LR P4	15 (Additional SSSI 5)	65	Fig 12.27	10 days over 1.1 years.	Predicted noise <55 dB at lake where waterbird features occur.
Embankment Removal	LR P4	15 (Additional SSSI 5)	67	Fig 12.42	8 days of the 1.1 years	Predicted noise <55 dB at lake where waterbird features occur.

Dig-down occurs on three occasions during the project, to begin extraction in each of the three separate areas of PFA deposition. These are in HR P1, HR P2, and LR P3, and the activity would last for three to five days in each location. With the exception of NSR 11 (*Additional SSSI 1* in Figure 12.17 in Chapter 12 of this ESA) during the initial extraction as part of phase HR P1, where a level of 57 dB is predicted, the predicted levels during the initial dig down and extraction / restoration periods are all < 55 dB, and in many cases are ≤ 45 dB.

Soil stripping would occur across the Site, in all phases, ahead of extraction within each microphase. The activity would last between five and 12 days per phase, depending on the size of the area, spread over the duration of the extraction period. When soil stripping is taking place within the Site, noise levels are predicted to reach 65 dB at several receptor points located on the near boundary of the SSSI. However, soil stripping, as previously noted, is limited to only a number of days per year because it is carried out progressively in micro-phases.

Embankment removal is primarily on the boundaries of the Site following extraction, to recover infill material for the restoration, and is therefore closer to the SSSI with less screening. The activity would last between five and 15 days per phase depending on the length and height of the embankment. Predicted noise levels associated with this activity are among the highest; however, due to retention of the SSSI on the southern boundary, they occur mostly away from the ecology receptor points. The closest embankment removal to the SSSI is in the southwest of Area A (HR P1-HR P2), where there are fewer SSSI features present due to the woodland habitats and in the northeast, where the SSSI boundary is set back from the Site. The highest noise levels are predicted to reach 67 dB at one receptor point in the northeast of the Site (NSR 15 / Additional SSSI 5), approximately 250 m from the boundary of the SSSI.

Further details about the noise measurement survey results and predicted noise levels due to the Amended Proposed Development are available in Chapter 12 of this ESA, including figures showing predicted noise contours for different activities/scenarios.

The highest noise levels are associated with short-term activities only, namely dig-down, soil stripping and embankment removal. The results present worst case noise levels, occurring when the activity is closest to the receptor. In practice, each of these would be a range of noise levels, decreasing with distance as the activity takes place in different parts of each individual phase. For example, soil stripping in HR P4 lasts 11 days, of which approximately five days would be 150 m from the SSSI, five days between 150 and 300 m of the SSSI and five days greater than 300 m from the SSSI, with resultant decreases in noise levels. Furthermore, this activity would take place periodically over time (four years in the HR P4 example), and therefore each event would be short in duration.

The predicted noise levels are worst case also, with exceedances predominantly at receptor locations near the SSSI boundary. It is expected that noise would decrease to tolerable levels (for ecological features) with distance into the SSSI, as demonstrated by the much lower predicted noise levels at the receptor locations within the SSSI (NSRs 5–8), and as per the contour figures presented in Volume 2 of this ESA.

Effects on birds from noise are predicted to be not significant, for the following reasons:

- the high existing maximum levels recorded by the surveys, all but one of which > 55 dB L_{AFmax} , including levels of >60 dB L_{AFmax} at Location ST2 adjacent to one of the waterbodies in the SSSI - the only feature condition status assessed recently in the SSSI has been for the aggregations of non-breeding birds (assessed in 2021) and it was found to be favourable;
- the three units that adjoin the Site (Units 5 – 7) are all in a favourable condition status, and therefore the units are likely to be more resilient to minor changes in nearby environmental conditions (in this case, occasional increases in ambient noise);
- the predicted levels during the main works being < 55 dB $L_{Aeq,1hr}$ (free-field) in all but one location and many being ≤ 45 dB $L_{Aeq,1hr}$ (free-field);

- the predicted levels of 65 dB $L_{Aeq,1hr}$ (free-field) occurring during the short ,temporary periods of soil stripping;
- as per the assessment within the ES, the recommended avoidance buffer to prevent disturbance effects on gadwall, a non-breeding feature of the SSSI, is 100-200 m⁶. The nearest lake with aggregations of gadwall is >300 m away from the nearest phase (and is visually screened by trees) and is therefore greater than the recommended buffer, a point that applies also to other wildfowl species;
- as per the assessment in the ES, breeding season interest features of the SSSI occur in land adjacent to the Site. They are typically common, widespread species of low conservation importance, such as mallard, mute swan and reed warbler. Given the low populations present within the zone of influence (in the context of the SSSI, which covers >3 square km of wetland habitat), and ubiquity and tolerance of the species concerned, comparatively minor changes in noise levels are not predicted to affect their overall conservation statuses within the designated site; and
- the noise levels predicted near the boundary of the SSSI are worst case and would decrease with distance into the SSSI, hence the predicted noise levels would be lower still across the majority of the SSSI (and the LWS).

8.10 Revised Restoration Scheme

A combination of the evolving Amended Proposed Development and views from stakeholders, including a meeting with NCC and NWT in June 2023, has resulted in a revision to the indicative restoration scheme. The Amended Proposed Development would be subject to an aftercare period of 30 years from the completion of restoration of each phase (or group of Phases).

The revised scheme is shown in Volume 3 of this ESA in TA 5.4 and includes the key changes listed below, which would significantly increase the value of the restored Site for biodiversity:

- Reduced areas of open standing water at the eastern end of the Site, with more scalloped edges and shallower depths;
- Reduced areas of native tree planting in the western edge of the Site and increased woodland / scrub planting along the southern edge;
- Increased and broader areas of wet grassland, and reduced areas of pasture;
- Scrapes included amongst the wet grassland that would be beneficial to amphibians, insects and other invertebrates;
- Areas of wet scrub along the southern edge of the Site; and
- Increased areas of species rich grassland at the western end of the Site.

Table 8.4 provides a summary of the habitats included in the revised restoration, highlighting changes in area compared to the previous version.

Table 8.4: Changes to Proposed Habitats in the Revised Indicative Restoration Plan

Habitat	New Area	Area Change	Habitat Description
Retained Woodland	6.75 ha	+4.65	Areas of the Site perimeter are deciduous plantation woodland, including within Sutton and Lound LWS and

⁶ Goodship, N.M. and Furness, R.W. (MacArthur Green) (2022) Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species. NatureScot Research Report 1283

			parts of the SSSI. The majority of trees are relatively young and are still protected with tree guards. The understorey includes creeping jenny, ground ivy, dove's foot-cranesbill, mouse-ear chickweed and yarrow. Changes to the layout, including retention of the SSSI, result in greater retention of woodland.
Retained Neutral Grassland	0.57 ha	+0	A narrow strip of neutral grassland would be retained next to the retained woodland on the western boundary of the Site.
Enhanced Hedgerow	0.44 km	+0.44	A stretch of hedgerow would be enhanced with planted trees along the public footpath adjacent to the wet grassland. This would provide improved connectivity between the proposed woodland/scrub and the woodland to the north of the site.
Proposed Woodland / Scrub	6.14 ha	+0	To be planted along the boundary running north to south in the middle of the site as a visual and noise buffer. Additionally, an area of scrub would be planted along the southern boundary, north of the neighbouring woodland to provide a graduated ecotone.
Proposed Advanced Planting	0.26 ha	+0.26	A small area of tree planting would be established prior to the extraction along the western boundary, as future screening.
Proposed Pasture	18.5 ha	-13.44	The proposed pasture on site has been much reduced and would now buffer the wet grassland and includes a field to the west of Site.
Proposed Species Rich Grassland	16.08 ha	+5.2	An increased area of species rich grassland would buffer a significant proportion of the perimeter of the site.
Proposed Wet Grassland	42.3 ha	+9.28	Wet grassland would extend beyond the scrapes, reedbeds and waterbodies which together comprise much of the restoration plan.
Wet scrub	1.15 ha	+1.15ha	Wet scrub to the south of the landowner access track, transitioning to drier scrub and grassland regeneration on the re-profiled bank. Includes some small clusters of ponds in the lower/flat area.
Proposed Reed Beds	6.4 ha	-2.16	Reedbed fringes would be planted alongside the standing waterbodies and shallow pools at the eastern end of the site.
Proposed Shallow Pool	2.78 ha	+2.78	Scalloped edges would radiate out from the proposed standing water areas and are designed with reedbed islands within the shallow pools.
Proposed Standing Water	2.1 ha	-6.1	To the east and west of the permissive bridleway that crosses the site, irregular shaped permanent water bodies are designed providing greater diversity than the previous restoration plan described. The standing water would be less deep too, with a greater edge area.
Proposed Scrapes	0.05 ha	0.05	Ephemeral scrapes have been integrated into the wet grassland, to enhance foraging opportunities, particularly for breeding waders and wintering waterbirds.
Proposed Ditch	3.57 km	-0.59	The proposed ditches for a network that flows through the Site, linking new waterbodies and connecting with a wider drain network in the northeast of the Site. The ditches can help control waterflows to maintain the wetland habitats.
Log Piles/Hibernacula/bat boxes	unspecified		Log piles and hibernacula would be provided along the woodland and hedgerow planting and adjoining the wetland areas for reptiles and invertebrates. Suitable retained trees would be selected for a number of bat and bird boxes.

8.10.1 Future Management and Aftercare

The restoration of each phase (or group of phases) would be subject to an aftercare period of 30 years. A Habitat Management and Monitoring Plan (HMMP) would be developed and agreed following planning approval, to be secured by a suitable planning condition. The aim of the management would be to achieve, as a minimum, the habitat target condition as included in the Biodiversity Net Gain assessment (Volume 3, TA 8.4) and maximise the value of habitats. Management by its nature would be adaptive, subject to environmental conditions and the proposed restoration approach would be regularly reviewed throughout the life of the amended Proposed Development and any amendments made as necessary. Table 8.5 provides examples of potential management within each habitat type.

A Steering Group is proposed (see section 8.7) which would provide a mechanism to allow cross-collaboration between stakeholders and help ensure the restoration delivers on its objectives. The management of the restoration would seek to compliment work of the NWT where relevant, for example, through interconnecting habitat and/or species management, to the benefit of species such as water vole.

Table 8.5: Potential Management within Each Habitat Type.

Habitat	Potential Habitat Management
Retained Woodland	Managed for natural regeneration of broadleaf species. Protected from excessive grazing and deer impacts. Halo releasing future veteran trees. Thinned and coppiced as appropriate to improve tree health. Ring Barking during required thinning to produce standing deadwood. Biosecurity of timber to prevent the spread of disease.
Retained Neutral Grassland	Manual removal of pernicious weeds, annual growth lifting either by cut and bale or grazing.
Enhanced Hedgerow	Cut back during the winter months on a three-year rotation.
Proposed Woodland / Scrub	Scrub coppiced on seven year rotation.
Proposed Advanced Planting	Tree guard removal and replacement of unsuccessful planting.
Proposed Pasture	Seasonal sheep grazing to be adjusted according to monitoring of the ground conditions. Manual removal of pernicious weeds.
Proposed Species Rich Grassland	Seasonal sheep grazing to be adjusted according to monitoring of the ground conditions. Manual removal of pernicious weeds. No supplementary feeding.
Proposed Wet Grassland	Seasonal sheep grazing to be adjusted according to monitoring of the ground conditions. Manual removal of pernicious weeds. No supplementary feeding.
Proposed Wet Scrub	Potential for non-intervention management. Alternatively, coppicing or selective thinning may be beneficial. Management of water level.
Proposed Reed Beds	Cut on a five year rotation. Manage scrub and vegetation to maintain a predominantly open reedbed. Manage water levels and distribution of water flow through the Site to ensure that this habitat does not dry out.

Existing Waterbody	Monitoring to ensure water quality does not become eutrophic. Vegetation Management. Barley Bales may be needed according to waterfowl numbers to ensure water quality. Silt may need to be pumped to a sacrificial pit on site in the long term in order to maintain the open aspect. Edge management to prevent excessive shading by trees. Invasive species management – should they arise.
Proposed Shallow Pool	Silt may need to be pumped to a sacrificial pit on site in the long term in order to maintain the open aspect. Edge management to prevent excessive shading by trees. Invasive species management – should they arise.
Proposed Standing Water	Monitoring to ensure water quality does not become eutrophic. Vegetation Management. Barley Bales may be needed according to waterfowl numbers to ensure water quality. Silt may need to be pumped to a sacrificial pit on site in the long term in order to maintain the open aspect. Edge management to prevent excessive shading by trees. Invasive species management – should they arise.
Proposed Scrapes	Manage water levels through the Site to ensure that this habitat does not dry out. Invasive species management and monitoring. Maintain through renewed scrapes when identified as required through monitoring programme.
Proposed Ditch	Manage water levels through the Site to ensure that this habitat does not dry out. Invasive species management and monitoring. Maintain open aspect through cutting regime of reeds.
Chipped surface bridleway	Encroaching growth cut back by hand. Weeds pulled by hand. No pesticide application permitted.
Permissive footpath	Hand scythed to remain open throughout the summer months.
Interpretation Board	Cleaned annually, updated every ten years to align with site changes.

8.10.2 Biodiversity Net Gain

The Biodiversity Net Gain (BNG) has been updated to take account of the revised restoration plan and has been evaluated both from an overall BNG and by grouped phases. The progressive restoration approach, all of which is delivered in Area A, would deliver BNG benefits from an early stage in the lifetime of the Amended Proposed Development and continuously throughout the lifetime, and not just post extraction of the PFA. The approach aligns with national and local planning policy and is mindful of the expectations of the Environment Act 2021, that should take effect from January 2024.

The BNG has been calculated in two ways:

- An overall estimate based on an average phase length of two years (11 phases over 22 years, equalling an average two-year delay) (Table 8.6). This mirrors the method provided in the ES, and therefore provides a direct comparison of the revised restoration against the previous version; and
- Phases split into groups and a bespoke delay based on the current estimates of each phase period grouped (Table 8.7), as a more detailed and realistic assessment.

Further details about BNG are contained in ESA Volume 3 TA 8.4.

Table 8.6 Estimated BNG Percentage Based on Average Phase Duration

Biodiversity Units	Baseline Value	Post-Development Value	Change in Units	Outcome
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Area-based Habitat Units	558.56	802.30	243.74	43.64%
Hedgerow Units	1.94	4.54	2.60	134.18%
River Units	0.00	26.52	26.52	100%

Table 8.7 Estimated BNG Percentages Based on Bespoke Phase Duration and Grouped

Grouped Phase(s)	Composite Phase(s)	Group phase delay in habitat creation (years)	Preliminary Metric outcome		
			Area	Hedgerow	Watercourse
1	HR P1	4	60.91%	N/A – no hedgerow in group phase	100%
2	HR P2	2	52.79%	N/A – no hedgerow in group phase	100%
3	HR P3, HR P4, HR P5, HR P6.	14	5.99%	87.36%	100%
4	LR P3, LR P4, LR P5	3	25.27%	N/A – no hedgerow in group phase	100%
5	LR P1 – Soakaway Ponds, LP P2 – Filter Ponds	1	17.97%	N/A – no hedgerow in group phase	100%

The BNG described above focuses on habitats and does not take account of any specific measures relating to fauna species, or connectivity into the surrounding habitats. The provision of new habitats as part of the restoration plan (e.g. hedgerows, woodland, shallow waterbodies, reedbeds, wet grassland, scrapes), would increase the breeding, roosting, foraging and commuting habitat available for a range of fauna species in the longer term, especially birds, bats, reptiles and invertebrates. There would be provision of new barn owl boxes and the Applicant would consult with NWT to ensure habitat creation and management would complement that within the adjacent reserve. The restoration works have been designed to complement biodiversity interests in surrounding areas and provide greater linkages with existing areas of nature conservation importance in the Site surrounds.

8.11 Statement of Significance

This ESA provides further information and assessment from that presented in the ES, and the two documents should be read and considered together.

Through assessment of habitats within the designated sites, and on qualifying/designated features, consideration has been given to impacts on the Sutton and Lound Gravel Pits SSSI and LWS. Potential effects on the designations, both alone and in combination, are assessed as being of low magnitude, and therefore not significant in terms of the EIA Regulations.

A range of other features have been assessed in this ESA including roosting bats, barn owl, and turtle dove. Overall, with implementation of the proposed mitigation measures, potential effects assessed as being of low magnitude, and therefore not significant in terms of the EIA Regulations.

Habitat enhancements achieved through a progressive restoration would benefit many species and would be a significant improvement of the baseline habitat condition, as measured through BNG.