The Moors at Arne Coastal Change Project

Planning Condition 22 Sand Lizard Method Statement

Environment Agency

March 2023

ENVIMSW002130-ATK-00-3XX-RP-EN-000039

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Document history

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Client signoff

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Contents

1. Introduction

1.1. Purpose of this Document

This Method Statement has been prepared in order to discharge Condition 22 associated with the full planning permission granted The Moors at Arne Coastal Change Project (planning reference P/FUL/2022/05149) on 11th January 2023.

Sand lizard (*Lacerta agilis*) are present on the Site and impacts upon the species have been assessed in the Environmental Statement (ES) submitted with the planning application (P/FUL/2022/05149). It is a condition of the permission that a method statement for sand lizard be produced, as set out below:

Condition 22. *No development may be commenced until a detailed method statement covering the mitigation approach to secure the conservation status of sand lizard populations affected by the development to include measures to encourage sand lizards to disperse into retained and newly created habitats shall be submitted to and approved in writing by the Local Planning Authority. The content of the method statement shall also include a Habitat Management and Monitoring Programme. The method statement will be implemented in accordance with the approved details.*

Reason: In the interest of protected species.

A Natural England (NE) A46 mitigation licence application will be submitted for the Project to satisfy the following considerations:

- To comply with both planning policy and species' protection legislation and conservation of sand lizard present within the Site.

1.1.1. Approach to licensed and non-licensed works

An EPS Licence is required for the project.

During earliest stages of works, the risk of encountering sand lizards is considered to be low. These works comprise activities in sub-optimal habitat areas or activities having low-impact localised effects in proximity to suitable habitat, where risks of an offence are very limited. Therefore, a Precautionary Method of Working (PMW) will be used to reduce any residual risks to an acceptable level for these non-licensed works. It should be noted that once the EPS licence has been approved by Natural England and the licence approved, the methodology outlined within the license will be definitive and supersede this method statement with regard to licensable activities during construction.

Precautionary approach for non-licensed works will include methods such as habitat manipulation and hand searches to identify whether any animals are actually present, encourage movement of individuals away from any works area and discourage their return and/or occupation. Should sand lizards be identified in any works areas, the approach would be reviewed and if sand lizards are considered to be at risk, or there is a risk of an offence, the activity postponed until it can be undertaken under licence.

An Ecological Clerk of Works (ECoW) with suitable experience will be present on site at all times and will advise with respect to the use of precautionary methods.

A sand lizard mitigation licence will be obtained to cover activities within identified core areas that are likely to cause killing or injury of sand lizards and/or loss of habitat suitable for egg-laying and hibernation. A licence will be applied for in 2023 to enable autumn scrub clearance and works to progress in areas with optimal habitat suitability for sand lizard. The key licensable works to be undertaken on Site are summarised below and described in more detail in Section 4:

- Construction of a haul route as part of enabling works that runs laterally between the eastern and central breaches, less than 10 m south of the existing tidal embankment where sand lizard occur.
- Excavation of the northern end of the internal creeks, which are close to or up to the existing tidal embankment.
- The creation of the breaches, which will result in a loss of habitat suitable for egg laying and hibernation for sand lizards within the existing tidal embankment.

The Project habitat creation and enhancement works are shown on ENVIMSW002130-ATK-XX-3XX-DR-EN-000083 in Appendix A.

1.2. The Scope of this Document

This document is largely based on the method statements drafted for the sand lizard European Protected Species (EPS) mitigation licence application, a copy of which will be supplied to Dorset Council as an informative. However, some site activities will not be completed under licence and the focus of this document includes the proposed approach to those works with respect to minimising the risks with regard to sand lizards in order to maintain favourable conservation status within the Site.

1.3. Structure of this Method Statement

This Method Statement includes the following contents:

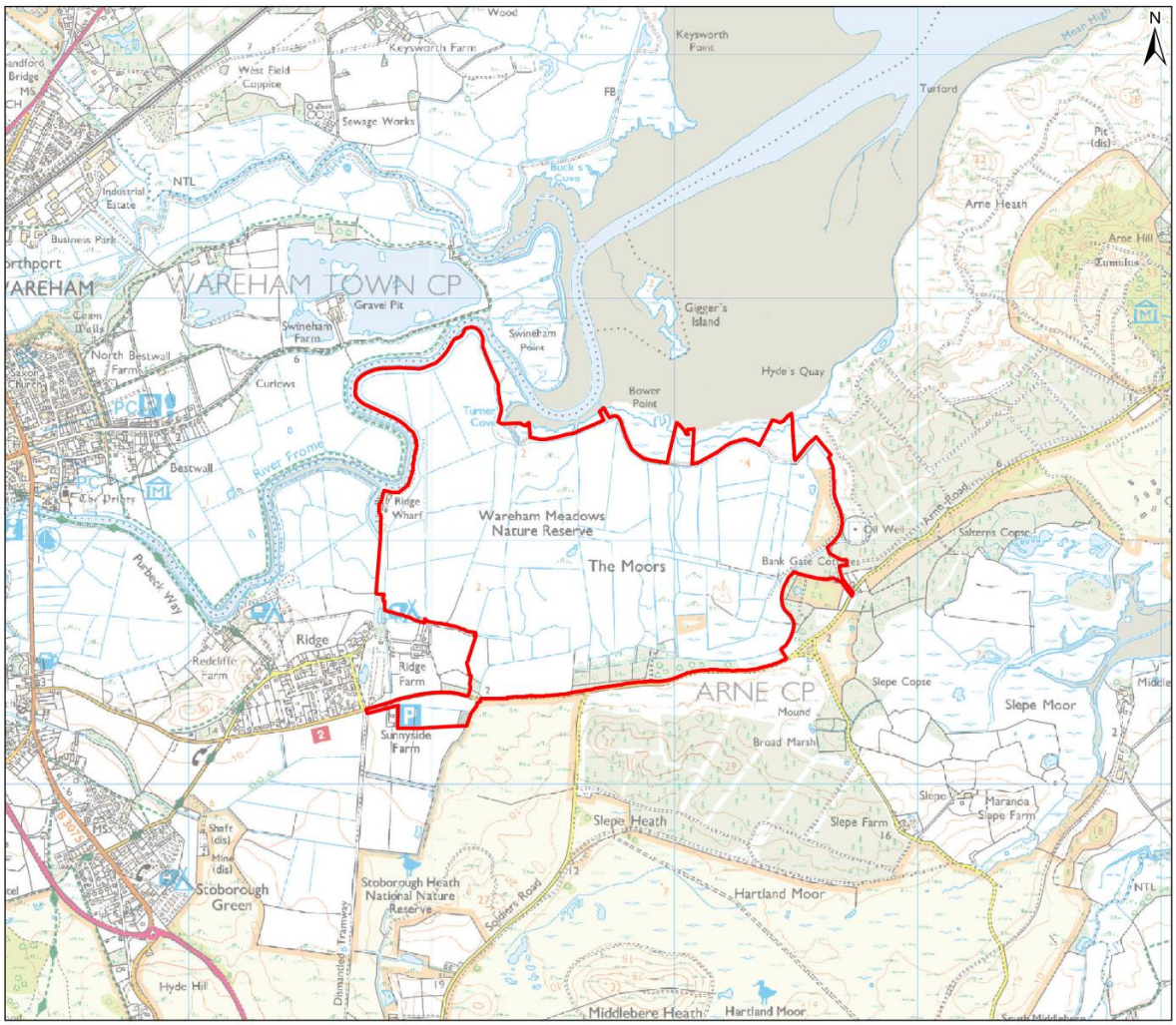
- Section 2 – Project Overview – summarises the project and construction programme.
- Section 3 – Sand Lizard Baseline – sets out a brief summary of the surveys undertaken for sand lizard and the key areas for sand lizard at The Moors Site.
- Section 4 – Mitigation Strategy – this sets out the habitat creation proposals for the Project and the mitigation measures to be used to minimise impacts on the sand lizard population as a result of the Project.
- Section 5 – Habitat Management and Monitoring Programme – how habitats for sand lizard will be managed post-development and the monitoring proposals.

2. Project Overview

This document relates to The Moors at Arne Coastal Change Project (the Project) promoted by the Environment Agency (EA). The Project is situated at the Moors at Arne, near Wareham in Dorset and located on central National Grid Reference SY945869. The extent of the Site boundary is presented in Figure 1-1 below.

The objective of the Project is to create compensatory intertidal habitat to replace that which will be lost within the wider Poole Harbour area due to "coastal squeeze", following the implementation of essential flood risk management works identified through the Poole Bay, Poole Harbour and Wareham Flood and Coastal Erosion Risk Management Strategy (Environment Agency, 2014). Where the losses caused by 'coastal squeeze' occur in an internationally important area that is protected by the Habitats Regulations, the EA is legally required to create compensatory intertidal habitat. This Project will meet this need for Poole Harbour.

Figure 1-1: Site Location and Boundary



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2.1. The Site

The proposal footprint of The Moors at Arne Coastal Change Project (hereafter referred to as the 'Site'), as indicated by the redline boundary in Figure 1-1 above, comprises a total area of approximately 200 ha; extending from Ridge Wharf and the River Frome to the west to Bank Gate Cottages at the east.

The EA has developed a proposal to create approximately 78 ha of new intertidal habitat at the Moors at Arne, adjacent to Poole Harbour. This will be done by making three openings (breaches) in the existing tidal embankment along the northern boundary of the Site.

Two new saline lagoons will be constructed in the west of the Site and will have controlled and regulated tidal exchange.

Existing areas of freshwater habitat will be retained behind the new eastern and western embankments. These freshwater habitats will be selectively improved and enhanced. Important terrestrial and freshwater habitats and species that currently inhabit what will become the new intertidal area, will be translocated into these freshwater areas before the breaches are made in the embankment and the Site is inundated with sea water.

2.2. Construction Overview

The construction of the Project will be divided into three 'Development Stages'.

It is proposed that the main construction period will commence in 2023 and will take place over three summer seasons between 2023 and 2025.

Some enabling works will be undertaken in the winter months, but the bulk of construction works will take place annually within the summer months (April to September inclusive). This is necessary to ensure the driest ground conditions to undertake the works, as very wet ground conditions are present on the Site in the autumn, winter and early spring months, creating adverse conditions for construction and vehicle movements. Summer working also reduces the risk of other delays due to storms and inclement weather and maximises use of available daylight hours. This working window will also avoid the potential impact of disturbance to wintering birds (present between October and March inclusive) using the site, which are qualifying features of Poole Harbour Special Protection Area (SPA) and Poole Harbour Ramsar site.

The key steps in the construction Development Stages comprise:

- 2023
  - Planning consent received
  - Enabling works (construction compounds and internal access routes)
  - Archaeological excavation and recording work
  - Enhance freshwater areas retained behind new embankments
  - Construct new Furzebrook outfall structure
- 2024
  - Excavation of material from borrow pits
  - Construction of western and eastern embankments
  - Construction of new River Frome access track
  - Excavate new internal creek network
  - Construct lagoon bird islands
  - Construct footpaths at Sunnyside Farm and in eastern part of Site
- 2025
  - Excavation of material from borrow pits
  - Construction of lagoon embankments
  - Clear intertidal area and complete habitat/species translocations
  - Excavate foreshore tidal channels
  - Create breaches in embankment – tidal inundation commences
  - Complete any reinstatement required and demobilise construction

The Project Overview Plan ENVIMSW002130-ATK-IZ-3AW-DR-C-000001 is provided in Appendix B.

3. Sand Lizard Baseline

3.1. Survey Findings / Core Areas

Suitability of the Site for reptiles, with particular attention afforded to sand lizards, was assessed during an Extended Phase 1 Survey of the Site and immediately adjacent habitats on 6th and 7th August 2020. The initial presence/ likely absence and Population Size Class Assessment (PSCA) surveys of potential habitat were undertaken on Site in September and October 2020 and May to July 2021. During Summer 2021, sand lizard habitat suitability and incidental sightings of sand lizard were also recorded within the central mound and central western area. No supplementary PSCA surveys were deemed to be required within these areas as it was considered likely the records were opportunistic individuals foraging in the areas. The central mound, however, was targeted within the sand lizard egg-laying habitat surveys undertaken in September 2021 as it was identified to have some suitability for shelter and egg-laying. Overall the survey effort confirmed presence of habitat of suitability for sand lizard and sand lizard populations within habitats throughout the Site, rather than just those subject to presence/likely absence and PSCA surveys.

During these surveys four areas in particular were identified as being suitable for sand lizard and requiring further survey. These are the existing tidal embankment, the north-eastern embankment, the eastern path and the heathland. Two additional areas with some suitability are also present and these are the central mound and central-western area, but were excluded from presence/absence surveys. The six areas are further described in Appendix C, Section C.1 and the location indicated on Sand Lizard Survey Area Map ENVIMSW002130-ATK-XX-3XX-DR-EN-0000157 in Appendix C.

3.2. Survey Results

Habitat Suitability Assessment

A habitat suitability assessment in areas suitable for egg-laying were undertaken within the Site Boundary between 6th and 23rd September 2021.

Habitat of optimal suitability for sand lizard with loose unconsolidated sandy substrate is confined to the central mound, north-east embankment and the existing tidal embankment, and largely absent from the rest of the Site, which is predominantly grazing marsh. On the whole the Site comprises limited optimal habitat for sand lizard, with the majority comprising sub-optimal habitat of transient or foraging suitability only (Appendix D Sand Lizard Habitat Suitability Assessment ENVIMSW002130-ATK-XX-3XX-DR-EN-0000155). Therefore, although the Site offers some habitat resource, there is a very limited amount of habitat, such as exposed sandy cliffs / banks and heathland, suitable to sustain sand lizard populations for egg-laying and hibernation. Connectivity throughout the Site is enabled through the numerous vegetated ditch networks at field boundaries and gravel access tracks with vegetated margins. Wider connectivity to habitats beyond the Site boundary is limited with localised crossing points on the eastern boundary of the Site where dense vegetation within the canal enables pioneering individuals to cross into RSPB Arne reserve. Connectivity to the south is also possible into heathland habitats, as Arne Road although likely to deter dispersal, is not considered an inhospitable barrier to sand lizards as it is a narrow country road (approximately 5 metres wide) with grassland and scrub vegetated road verges.

Sand Lizard Egg-Laying Habitat Surveys

Alongside the sand lizard egg-laying habitat surveys, a concerted effort to detect sand lizard hatchlings found sand lizard hatchlings in two distinct areas: the existing tidal embankment and the central mound (see Appendix E Sand Lizard Habitat Suitability and Habitat Loss Plan ENVIMSW002130-ATK-XX-3XX-DR-EN-0000184). A total of 19 sand lizard hatchlings were found across the four surveys. These individuals were recorded on the existing tidal embankment on all four visits, whereas only one individual was found in the central mound, on one occasion. This was during the first visit, where hatchlings were seen on top of a stack of hay bales, before retreating within. Adult and sub-adult sand lizard were also recorded during the sand lizard egg-laying habitat surveys. No egg-laying suitability or evidence of egg-laying has been recorded on the naturally high ground to the west of the eastern breach (refer to Appendix D Sand Lizard Habitat Suitability Assessment ENVIMSW002130-ATK-XX-3XX-DR-EN-0000155). Results are presented in Appendix F, Section F.1.

Presence / Likely Absence Surveys

Between September and October 2020, May to July 2021 and May to September 2022 a total of 20 presence / likely absence surveys for sand lizard were undertaken on Site. These 20 surveys are supplemented by sand lizard sightings being recorded during refugia deployment on 08/09/2020 and a visual only survey on 14/09/2020, resulting in a total of 22 visits. Of these 22 visits, sand lizards were recorded on 17 visits, with no sightings recorded on refugia checks 9, 10, 11, 13, and 16. Results of the presence / likely absence surveys are provided in Appendix F, Section F.2.Sand lizard presence/ likely absence survey results plan ENVIMSW002130-ATK-XX-3XX-DR-EN-0000158 in Appendix F shows where sand lizards were recorded. Sand lizard records from egg-laying habitat surveys are also provided in Appendix F, in figure ENVIMSW002130-ATK-XX-3XX-DR-EN-0000156.

Additional evidence found during the presence / likely absence surveys included adult sand lizard sloughs (found on Deployment, check 1, 12 and 14). Sloughs cannot be factored into PSCA as without DNA analysis, it cannot be determined whether they are from adults different to any others counted during a given survey. However, even to include the sloughs into the PSCA for each of the visits of Deployment, check 1, 12 and 14 would not result in the PSCA being upgraded. This is also the case for lizards whose species could not be identified due to the fleetness of sighting. Due to the inability to confirm whether viviparous lizard or sand lizard, such instances have not been included in sand lizard population size class assessments. However, even if they had been included in any of the sand lizard species counts, the peak count would not have been upgraded.

3.3. Impacts on Sand Lizards

Enabling works for the Scheme will comprise the construction of a haul route between April and June 2023, running laterally between the eastern and central breaches. Although the route is situated less than 10 m south of known sand lizard populations within the existing tidal embankment at its nearest, it is separated from the existing tidal embankment by a large drainage ditch that runs the majority of the length of the embankment. The excavation of the internal creek network will include works between July and September 2024 and creation of the breaches October to December 2025. Excavation of the internal creek network will result in habitat suitable for foraging. The breaching of the existing tidal embankment will result in a loss of habitat suitable for egg laying and hibernation for sand lizards, as well as disturbance to sand lizards present within retained habitats.

The inundation of the Site (at the point of breaches being excavated), scheduled for October 2025 will result in a large loss of core foraging habitat for sand lizard, as well as habitat of transitory use only.

The Project would result in the permanent loss of approximately 40 ha of indicative core foraging habitat suitable for sand lizard and 344 m of linear sand lizard habitat within the Site. The Project retains 14 ha of existing suitable habitat for sand lizards landward of the Eastern embankment. The permanent loss includes habitat suitable for egg laying (0.5 ha and 175 m) and hibernation (1 ha and 170 m), as well as foraging, basking, sheltering habitat.

4. Mitigation Strategy

4.1. Introduction

The purpose of this section is to show how, through the mitigation measures being implemented, the conservation status of sand lizards will be maintained. It sets out the project constraints in relation to sand lizard and the approach to be taken to avoid or minimise the risk of causing an offence. This includes the habitat enhancement and compensation proposals that will ensure the conservation status of the species is maintained in the long-term, once the project is operational.

A programme for the proposed mitigation is outlined in Table 3-1 below with non-licensable and licensable activities indicated (green and orange, respectively).

4.2. Summary of Mitigation Strategy

The construction of new embankments and breaching of the existing tidal embankment will lead to loss, disturbance and isolation of sand lizard habitat. In addition to measures to protect individual sand lizards, mitigation for habitat loss, specifically the creation of additional egg-laying habitat in key areas of retained or created habitat, will be provided within the Site. The purpose of this method statement is to detail the above-mentioned mitigation and habitat creation measures.

Proposed measures to reduce adverse effects on individual sand lizards include taking a precautionary approach to works and using phased habitat manipulation in sub-optimal habitat, where the risk to sand lizards is low, which are non-licensable activities.

A programme of licensable trapping and translocation proposed along the existing tidal embankment is set out in Table 4-1, below. A detailed programme of trapping and translocation will be provided within the licence application and is not discussed in this document. This will include relocating sand lizards to enhanced and created habitats during various phases of the construction works. Habitat connectivity will be maintained with suitable habitat outside the Site to the east with the construction of the eastern embankment tie-in, a land bridge created by the infilling of the canal on the eastern Site boundary.

4.3. Works to be Overseen by the Suitably Qualified Ecologist

The non-licensable and licensable activities relating to sand lizards are set out below. Non-licensed works will be supervised by a Suitably Qualified Ecologist[1] (SQE) / ECoW, whilst the main construction works undertaken under the EPS licence for sand lizard will be supervised by an SQE who will be the EPS licence holder or accredited agent named on the licence.

4.3.1. Habitat Manipulation (non-licensable)

4.3.1.1. Phased Vegetation Removal

A precautionary approach will be taken to early works in areas of sub-optimal value to sand lizards. This will comprise a programme of habitat manipulation with hand searching where necessary. Habitat manipulation / vegetation removal works will be supervised by an SQE / ECoW.

The early non-licensed works will comprise:

- Pre-commencement vegetation clearance to enable water level management and the construction site compound set-up;
- Construction of haul routes (away from optimal sand lizard habitat in the north and north-west of the Site); and,
- Construction of the Western Freshwater Area.

Prior to vegetation removal, all potential sand lizard refugia will be moved from the area, i.e. areas where there is a low risk of encountering sand lizard. If work has to be undertaken during the core bird nesting season, a detailed inspection for nesting birds of all vegetation due for clearance will be carried out by the SQE / ECoW no more than 24 hours prior to any works being undertaken to

[1] In this instance, the term Suitably Qualified Ecologist is used to describe the named ecologist, or an accredited agent experienced at working with sand lizards.

minimise opportunities for nest building between the survey and the start of works. Any nest in use or being built during this inspection will be left undamaged, with an appropriate buffer of surrounding vegetation for the entire nesting period and alternative approaches to the works proposed. This buffer will be dependent on the species present and the adjacent habitat and will be determined on a case by case basis by the Ecologist

Phased vegetation removal will be conducted in a three-stage approach. All cutting of vegetation will be supervised by a SQE / ECoW and undertaken in a phased way that comprises cutting vegetation to an initial height of no less than 300 mm at the first cut, 150 mm at the second cut and as close to ground level as is practicable following the third cut. The area will be left for 24 hours following each cut and, where necessary, the arisings collected / removed whilst undertaking a visual check for sand lizards. Following this third cut, vegetation will be maintained at this height throughout the works period or until the habitat is made inhospitable by ground works.

4.3.2. Capture, Relocation and Exclusion (licensable)

The majority of the main construction works will be undertaken under the EPS licence for sand lizards. The specific activities / work components are listed below with details on the proposed approach detailed in the proceeding text:

- Vegetation clearance (Phase 1) on the existing tidal embankment and on the high ground adjacent to the existing tidal embankment;
- Site clearance of higher risk sand lizard foraging habitat (extent to be confirmed on Site);
- Local discouragement, capture and destructive search of existing tidal embankment to allow temporary culvert installation (if required);
- Destructive search of breach channel extent (where required) and where necessary the existing high ground adjacent to existing tidal embankment;
- Vegetation clearance (Phase 2) on the existing tidal embankment and on the high ground adjacent to the existing tidal embankment;
- Temporary habitat enhancement works of retained north-eastern embankment;
- Bracken clearance / enhancement works east of the canal;
- Fence installation (if required);
- First pass translocation from existing tidal embankment and where necessary the existing high ground adjacent to the tidal embankment (into temporarily enhanced habitats);
- Vegetation clearance (Phase 3) on the existing tidal embankment;
- Main translocation from existing tidal embankment and where necessary the existing high ground adjacent to the tidal embankment (into temporarily enhanced habitats);
- Main translocation from existing tidal embankment (onto established habitats on eastern embankment);
- Destructive search of breach locations.

4.3.2.1. Phased Vegetation Removal

Suitable habitat for sand lizard egg-laying, hibernation, foraging, basking and shelter will be permanently lost through the undertaking of works on or in proximity to the existing tidal embankment. This includes the following works:

- Creek installation (the northern extent affects the existing tidal embankment);
- Foreshore channel excavation (the southern extent affects the existing tidal embankment);
- Breach excavation within the existing tidal embankment.

The initial stage will involve vegetation removal to encourage sand lizards into suitable habitats eastward along the existing tidal embankment or expose them, allowing for capture. Phased vegetation removal will be conducted as outlined under Section 4.3.1 above. Any incidental sand lizards captured during habitat manipulation will be released in receptor areas in the northeast of the Site (see below for details). Three separate phases of vegetation removal are proposed due to winter break in construction works.

4.3.2.2. Timing and effort

The capture and relocation effort will aim to achieve as many days of capture as possible within suitable weather conditions over the course of one season (ideally 60 days), prior to works. The trapping effort may only be ceased once five clear days of no sand lizards being observed have been completed within this period during suitable weather conditions. Suitable weather conditions are defined as per HGBI (1998)[2] as sunny, air temperature ≥9°C, with little or no wind or precipitation. If weather conditions allow, trapping would commence sooner to reduce the risk of trapping extending into the works period.

Monitoring and supervision of the trapped area would continue until the relevant construction activity has been completed. Doing so ensures that any sand lizards going to ground and able to evade initial capture are detected. Additionally, if any egg clutches have been laid within the capture area, the hatchlings would also be detected and captured.

4.3.2.3. Capture methods and care of captured reptiles

Sand lizards use artificial refugia comparatively rarely (Sewell et al, 2013)[3] and therefore, the primary method used to locate and capture sand lizards would be noosing and capture by hand. Each capture visit would entail a SQE repeatedly walking the capture area, searching for lizards within all suitable areas of habitat. Repeated covering of the same area enables the ecologist to build up a detailed understanding of sand lizard use of the habitat, particularly the identification of favoured basking spots. The ecologist will continue to cover the area until the weather conditions, or the time of day become unsuitable, or no more lizards are seen. Once captured, sand lizards will be released immediately into suitable habitat, the location dependent on time of capture. Early captures (prior to eastern embankment construction and establishment) will be released in temporarily enhanced habitat in the north-eastern corner of the Site, whilst all captures during the main translocation will be released on to the new eastern embankment.

As the majority of sand lizards will be released into newly enhanced and/or created habitats on Site, where no sand lizards or very few sand lizards have been previously recorded, there is no threat to any would-be resident sand lizards present within the receptor area, such as exceeding carrying capacity or introduction of pathogens.

Throughout the construction programme during the active period for sand lizards, individuals incidentally discovered will also be captured and relocated as detailed here.

4.3.3. Exclusion (licensable)

Where necessary, as part of trapping, temporary exclusion fencing will be erected. This will comprise linked fencing extents (exact fencing specification still to be confirmed). Installation of fencing (if required) will be undertaken prior to trapping after vegetation clearance and will be installed using hand tools under the supervision of the licence holder. Machinery may be used, for example, a plant with a trenching tool, but this will be dependent on practicalities such as access. It is suggested that fence installation may be undertaken as early within the active sand lizard season as possible, providing conditions are suitable for sand lizards to be active, to enable as many capture days as possible prior to construction activities. All fencing will be left in situ throughout the trapping effort as well as the relevant works.

4.4. Habitat Creation

4.4.1. In-situ retention of breeding sites/resting places

It is not proposed to maintain habitat suitability within the extent of the existing tidal embankment as any remnant population would be subject to isolation and possible in-breeding. Therefore, habitat manipulation and trapping will be undertaken (as detailed above).

Although the central mound will be subject to disturbance from the creation of the eastern embankment and enabling works, suitable habitat for egg-laying, hibernation, foraging, basking and

[2] Herpetofauna Groups of Britain and Ireland (1998) Evaluating local mitigation/translocation programmes: Maintaining Best Practice and lawful standards. HGBI advisory notes for. Amphibian and Reptile Groups.
[3] Sewell, D., Griffiths, R.A., Beebee, T.J.C., Foster, J., & Wilkinson, J.W., 2013. Survey protocols for the British herpetofauna. Version 1.0. Available online: http://www.narrs.org.uk/documents/Survey_protocols_for_the_British_herpetofauna.pdf [Accessed 06/12/2022].

shelter will also be retained in this area. Habitat connectivity will be provided towards the north-east of the Site and further opportunities for hibernating, egg-laying, foraging, basking and shelter provided in the form of the sand lizard bunkers along the eastern embankment (refer to Appendix A Habitat Creation and Enhancement Plan ENVIMSW002130-ATK-XX-3XX-DR-EN-000083).

4.4.2. New breeding site/resting place creation – dimension details, location details, materials to be used (where applicable), aspect etc.

The final construction of the eastern embankment will comprise a new habitat feature approximately 850 m in length. The eastern embankment will span from the north-easternmost extent of the Site boundary, continuing southwards for approximately 350 m before curving towards the central mound westward. Through the course of this distance and configuration, the landward side of the embankment provides habitat of southern, south-eastern, and eastern orientations.

Habitat connectivity between the Site and the wider Arne SSSI is currently limited, with the canal separating the two. The canal will be infilled at the northern extent of the eastern embankment with gorse and heather encouraged within the infill providing contiguous habitat connectivity for sand lizard between the Site and the wider Arne SSSI, tying into the suitable habitat within the western-most extent of Arne SSSI, where sand lizards are known to occur. A continuous swathe of acid grassland will be created along the entire landward side of the eastern embankment immediately upslope of the sand lizard bunkers providing continuous suitable habitat for travelling lizards, maintaining habitat connectivity with habitats to the north of the Site and with the sand lizards present on the central mound. With movements of sand lizards across the Site enabled, the risk of fragmentation and isolation is significantly reduced.

Nine sand lizard bunkers will be installed along the landward side of the eastern embankment. Of the nine bunkers, four will be east facing, three southeast facing, and two south facing. The bunkers will be trapezoidal in plan, approximately 2.5 m wide and 20 m in length. The sand deposited within the bunkers will be between 0.3 – 0.5 m in depth, and constructed to enable sloping sandy substrate, thereby providing a suitable depth for egg-laying and hibernating, and lined with a hessian material, if required, to promote sand retention. The bunkers will be of a raised profile, with sides of a 1:4 gradient of a sandy/granular material substrate to support interspersed grassland and scrub, such as gorse, bracken and heather (see Sand Lizard Habitat Creation ENVIMSW002130-ATK-00-3AW-DR-C-000040 in Appendix G). Sand within the bunkers will be managed when necessary to ensure open area of bare sand remain present. This will be undertaken approximately every three years following the Project's completion.

Within the Environmental Statement (July 2022), habitat creation features for sand lizards are included on the naturally high ground situated immediately west of the eastern breach (hereafter the 'high ground', see location as indicated on the Habitat Creation and Enhancement Plan in Appendix A). Habitat measures include infilling part of the existing ditch immediately south of the existing tidal embankment to provide connectivity to the existing tidal embankment, acid grassland establishment and the addition of sand lizard bunkers. Following preparation of draft method statements for the EPS sand lizard mitigation licence and the proposed trapping along the existing tidal embankment, the risk of a remnant population is considered to be significantly reduced. Therefore, creation of additional habitat on the high ground is unlikely to be required to meet the 'favourable conservation status' test. However, potential provision of habitats enhancements on the high ground may be provided. This will be confirmed following completion of the EPS sand lizard mitigation licence. Should there be changes to the habitat features provided on the high ground as a result of the preparation of the EPS sand lizard mitigation licence, Dorset Council will be advised in writing of said changes.

Table 4-1 - Mitigation Programme (green bars – non licensed work; orange bars – work under EPS licence)

Activity	2023												2024												2025											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Early works (non-licensed): Vegetation clearance, site access and compound set up																																				
Early works (non-licensed): Haul routes																																				
Early works (non-licensed): Western freshwater area																																				
Local discouragement, capture and destructive search of embankment to allow temporary culvert installation at breach locations (if required) (licensed)																																				
Existing tidal embankment vegetation clearance (Phase 1) (licensed)																																				
Site clearance of higher risk sand lizard foraging habitat areas (licensed)																																				
Destructive search of breach channel extent (where required) (licensed)																																				

Activity	2023												2024												2025											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Existing tidal embankment vegetation clearance (Phase 2) (licensed)																																				
First pass translocation (into temporary habitats) (licensed)																																				
Existing tidal embankment vegetation clearance (Phase 3) (licensed)																																				
Main translocation (into temporary habitats) (licensed)																																				
Main translocation (onto eastern embankment) (licensed)																																				
Destructive search of breach locations (licensed)																																				
Capture of incidentals throughout construction programme																																				

5. Habitat Management and Monitoring Programme

5.1. Habitat Management

5.1.1. Sand lizard bunkers

Provision and maintenance of open sand is possibly the most critical management practice for sand lizard conservation (Moulton and Corbett, 1999)[4] as sand lizards are dependent upon bare sand for egg-laying. The habitat creation proposals include the creation of sand lizard bunkers. Whilst some vegetation growth is supported within the created bunkers, providing foraging, mosaic basking (basking within partial sunlight, such as through dappled foliage, rather than completely exposed in sunlight), shelter and cover for egg-laying females, the amount of vegetation will need to be managed. To provide conditions most likely to encourage successful incubation, sand lizard eggs require a fine, well drained sand containing at most only a very small amount of organic matter. The bunkers will be subject to vegetation removal (digging or pulling) to ensure that bare sand remains a component of the habitat. If the organic matter content within the sand bunkers is assessed as being too high, remedial action to reduce the amount of organic matter will be considered. Any vegetation removal or other sand management will be undertaken between mid-April and mid-May on sunny days as sand lizards are active and above ground during this period, following emergence from hibernation and before egg-laying will occur.

It is proposed to undertake the management of the bunkers every three years, as outlined in the Habitat Creation, Management and Monitoring Plan (HCMMP)[5] for the duration of the plan period i.e. five years post-construction. However, the frequency, approach and duration of management will be confirmed / agreed in the EPS sand lizard licence. Beyond 2030, at the end of the five years covered by the HCMMP, the RSPB, as the landowner, will produced a management plan, which will be aligned with the objectives of the HCMMP and maintenance of the conservation status of sand lizards on Site.

5.1.2. Gorse and bracken control

In areas known to currently accommodate gorse, such as the central mound, an annual assessment must be undertaken to determine whether gorse removal or coppicing is required. This frequency of assessment is required due to the prevalence and persistent nature of gorse growth. Whilst the presence of gorse within a mosaic of other scrub and vegetation within suitable sand lizard habitat can be beneficial, if allowed to become too prevalent, it can shade open ground and reduce the basking and foraging opportunities.

Successful removal of gorse usually requires chemical spraying, which involves being sprayed with Picloram, or similar, following cutting, or holes drilled into the stumps and filled with Glyphosate. Whether through the undertaking of gorse coppicing or removal, the number of persons conducting the works will be kept low to reduce disturbance to sand lizard habitats. Only hand tools should be used and all arisings removed by hand. Once removed from areas of suitability for sand lizard, gorse arisings may be burnt or dealt with in a way deemed more appropriate, if there is a particular fire risk. Any gorse control works should be conducted during mid-September – end of February to avoid impacts to active reptiles and nesting birds; the works are unlikely to impact sand lizards below-ground outside the active season.

In areas known to currently accommodate bracken, such as the central mound, an annual assessment will be undertaken to determine whether bracken cutting or removal is required. As for gorse, bracken forms part of the habitat mosaic and offers potential basking, sheltering and foraging opportunities. Dominance of bracken can shade open ground and reduce the above habitat benefits. Cutting is effective if undertaken regularly (such as two or three times per season between mid to late summer). If required, bracken spraying should be undertaken between July and August to be effective whilst the fronds are fully unfurled but not hardened off. All works, whether cutting, spraying, or removing arisings will be done by hand to not only reduce potential disturbance to sand lizard habitat, but also reduce the likelihood of chemicals being deposited outside target areas.

The use of herbicides will be used in a way that reduces any impacts to not only sand lizard but any other fauna, non-targeted flora or aquatic features such as the extensive ditch networks on Site or the immediately adjacent sensitive habitats on Sites. Recommendations regarding the use of herbicides for vegetation control are as per

[4] Moulton, N and Corbett, K. (1999) The Sand Lizard Conservation Handbook. Species Recovery Programme Series English Nature, 1999. ISBN 1857164601, 9781857164602

[5] Atkins (2023) The Moors at Arne Coastal Change Project Habitat Creation, Management and Monitoring Plan. March 2023.

those recommended within supportive literature for sand lizard habitat management (Moulton and Corbett, 1999)[6]. The ultimate decision making with regard to the application of any herbicides used will be to the discretion of the specialist contractor appointed for the works in liaison and agreement with the Environment Agency, the landowner, RSPB and Natural England.

5.1.3. Management responsibilities

The Construction Environmental Management Plan (CEMP) will outline the management measures required during construction (up to 2025). The scheduling and details of habitat management for the following five year period (2025-2030), are defined in the HCMMP and management measures within the HCMMP relating to sand lizard are set out in Table 5-1 - Habitat Management and Monitoring Measures below.

Table 5-1 - Habitat Management and Monitoring Measures

Broad Management Aims / Objectives per Habitat Component	Proposed Habitat Management Approach (for achieving aims / objectives)	Timing (start/ frequency)
Management of Sand lizard foraging habitat - on the landward side of the Eastern Embankment		
Establish and maintain good quality acid grassland on the landward facing slope of the Eastern Embankment.	Monitor grassland establishment / cover and undertake remedial measures (e.g. overseeding) as required.	Start: Year 1 (2026) Timing: April to October Frequency: at least once
	Once established, maintain habitat quality through low intensity grazing. Remedial measure: localised removal of scrub / ruderal species where these reduce habitat quality.	Start: Year 1 (2026) Timing: July to October Frequency: annually
	Maintain fencing on the landward side of the Eastern Embankment (which allows areas to the south and east of the embankment to continue to be managed by livestock-grazing, whilst keeping livestock off the establishing embankment).	Start: Year 1 (2026) Timing: Anytime Frequency: annually
Maintain extent / quality of acid grassland within the three retained areas on Site: central mound (within the Eastern Embankment), higher ground within the Western Freshwater Area and within retained habitat on the eastern boundary of the Site	All three areas will be subject to periodic low intensity grazing by livestock	Start: Year 1 (2026) Timing: April to October Frequency: annually

[6] Moulton, N and Corbett, K. (1999) The Sand Lizard Conservation Handbook. Species Recovery Programme Series English Nature, 1999. ISBN 1857164601, 9781857164602

Management of Sand lizard bunkers – Eastern Embankment, measures for specific species receptors		
Maintain the integrity of sand lizard bunkers on the Eastern Embankment by ensuring areas of open sand remain available and there is no intrusion from scrub / undesirable species.	Management works to be informed by monitoring and could be staggered to only disturb half or one third of the reptile habitat on the embankment in any given works season. Bare ground / sand to be maintained within bunkers during the establishment period. Digging or pulling of vegetation is likely to be required every three to five years. Remedial measure to improve the sand bunkers may be required if the organic matter content gets high enough to deter egg-laying. Works should be undertaken within the period sand lizards are active, avoiding the core breeding season, which will allow animals to move away and reduce the risk of disturbing hibernating lizards. Consideration should also be given to other ecological constraints, such as nesting birds.	Start: Year 2 (2027) Timing: April or October Frequency: every three to five years

Post-construction, the Site will be managed following the HCMMP, as required by planning conditions and to cover a five year period 2025 – 2030. During this time, it will be the responsibility of the Environment Agency, the RSPB and Natural England to ensure that the above management and maintenance techniques are undertaken. Annual assessment of habitat quality in relation to gorse and bracken growth, and the extent of open sand habitat will be conducted for five years following the post-construction HCMMP.

Following the completion of the five year HCMMP plan period, the landowners (RSPB) will manage the Site (excluding Sunnyside, owned by Natural England that does not have potential for sand lizards) in accordance with their own management plan and will include appropriate management measures for sand lizards and align with the objectives set out in the HCMMP.

A habitat management programme for sand lizard habitats is outlined in Table 5-2 - Habitat Management and Monitoring Programme below.

5.2. Population Monitoring

The post-construction monitoring surveys undertaken over the course of five years following the Project's completion will aim to confirm that sand lizards are present on Site and utilising created and improved habitats on the landward side of the Eastern Embankment and other retained / enhanced habitats.

Surveys will include the central mound to ensure that sand lizard populations have persisted despite disturbance associated with the completion of the Eastern Embankment. The timing of the monitoring surveys will be defined within the EPS mitigation licence for sand lizards.

The result of the monitoring surveys will determine:

- Presence of sand lizard, including population size class (where necessary);
- The age classes present and whether these indicate breeding activity, i.e. the presence of hatchlings;
- The timing of sand lizard presence, i.e. recently emerged adults, indicating hibernation;
- The location of recorded animals, indicating distribution, the favoured habitat areas and relative connectivity of the habitat.

The surveys will aim to confirm that sand lizards are successfully utilising created and enhanced habitats Site.

Success is considered to be the presence of a Low population of sand lizard within the Site, i.e. no loss of conservation status from pre-construction baseline, evidence of breeding and successful hibernation, good distribution throughout the Eastern Embankment, including the central mound, which indicates that the habitat is providing good connectivity.

Survey methodology for the monitoring surveys will be confirmed in the EPS mitigation licence for sand lizards. In the event that presence is confirmed within any of the locations mentioned above, population size class assessments will then be undertaken. This is likely to be a requirement of the EPS licence.

An assessment of the condition / quality of the sand lizard habitats on the Eastern Embankment, including the central mound, will also be a factor in consideration of sand lizard mitigation and habitat management success.

A monitoring programme is outlined in Table 5-2 - Habitat Management and Monitoring Programme below. Sections of the table highlighted in blue indicate monitoring and management measures, whereas light blue indicates habitat control interventions (where needed).

Should the results of monitoring be unfavourable, additional intervention for habitat management may be required. This may include changing the approach to habitat management, re-seeding failed grassland habitat to maintain connectivity, adding additional refugia or hibernacula to increase sheltering and overwintering opportunities or managing post-construction disturbance impacts.

Table 5-2 - Habitat Management and Monitoring Programme

Activity	Specific timings	2026	2027	2028	2029	2030
Habitat / population monitoring	March – May for five years following completion of the Project (2025)					
Gorse and bracken assessment	Annually following completion of the Project					
Gorse control (cutting or removal)	Mid-September – end of February, as required (as discussed in 5.1.2, above)					
Bracken spraying	July and August, as required (as discussed in 5.1.2, above)					
Management to maintain extent of open sand in bunkers for breeding	Between mid-April and mid-May, every 3 years following completion of the Project (2025), (timing to be confirmed within the sand lizard EPS licence)					

5.3. Mechanism for Ensuring Delivery of Post-development Works

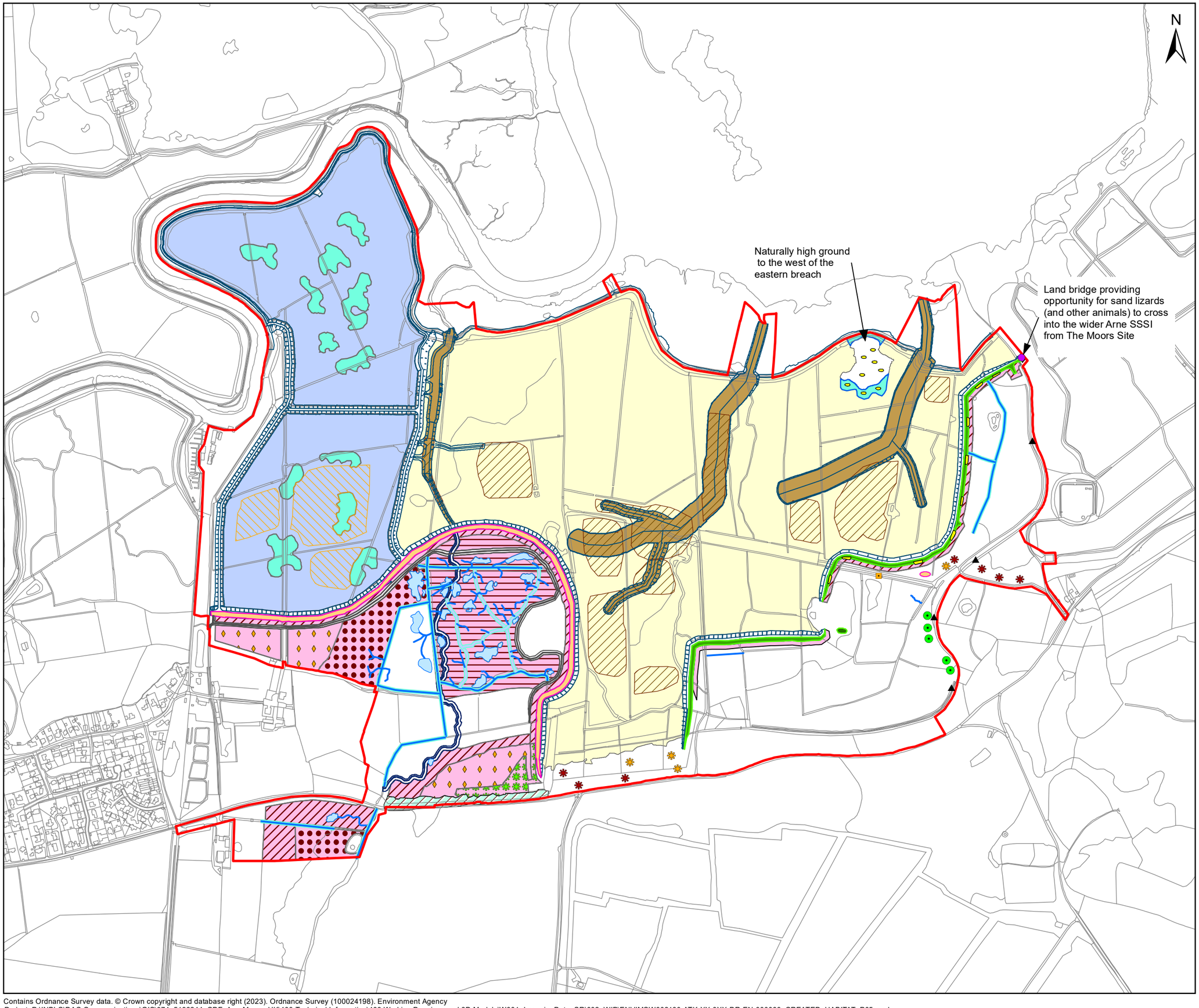
A commitment to the delivery of measures to mitigate and compensate for impacts to sand lizard is made in the Environmental Statement for the Project. To monitor the effectiveness of the mitigation and compensation proposed, a programme of post-construction monitoring and objectives / targets for the Site will be agreed. The HCMMP, a requirement of a planning condition, will detail the monitoring commitment and the mechanism by which it will be delivered for the five years post-construction.

Appendices

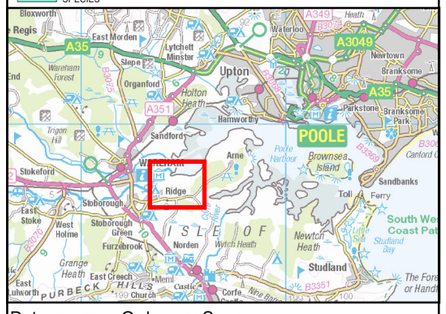
Appendix A. Habitat Creation and Enhancement Plan

CDF-SW-DCS Appraisal
The Moors at Arne Coastal Change Project

HABITAT CREATION AND ENHANCEMENT



- SITE BOUNDARY
- HABITAT PILES
- BAT BOX
- BIRD BOX
- RECEPTOR AREA: CREATED HABITAT ON NEW LAND BRIDGE AND INFILLED DITCH / INTERCONNECTING SAND LIZARD HABITAT
- STOP LOG FEATURE / LOCAL BLOCKAGE IN 'CANAL'
- PROPOSED STOP BOARD TO MAINTAIN WATER LEVEL (AT LEAST UNTIL EASTERN EMBANKMENT OUTFALL#2 IS OPERATIONAL)
- CREATED DITCH
- ENHANCED DITCH
- DITCHES TO BE ENHANCED AND WHERE NECESSARY CREATED, DEPENDING ON SITE SPECIFIC CONDITIONS
- TOE DITCH (ALSO PROVIDING ECOLOGICAL ENHANCEMENT)
- PROPOSED EMBANKMENTS
- CREATED AND/OR MANAGED M23 RUSH PASTURE
- CREATED AND/OR MANAGED M24 FEN-MEADOW AND FRESHWATER DITCHES AND SCRAPES
- CREATED M25B MIRE
- CREATED AND/OR MANAGED M25B MIRE WITH INDIVIDUAL TREE PLANTING
- CREATED AND/OR MANAGED M24 FEN-MEADOW
- CREATED AND/OR MANAGED TRANSITIONAL M23 RUSH-PASTURE / M25 MIRE
- CREATED WOODLAND SCREENING HABITAT / BAT COMMUTING AND FORAGING HABITAT
- CREATED SALINE LAGOONS
- CREATED ACID GRASSLAND AND INTERCONNECTING SAND LIZARD HABITAT
- LAGOON ISLANDS SUITABLE FOR NESTING AND ROOSTING BIRDS AS WELL AS OTHER SPECIES
- FURZEBROOK STREAM ALIGNMENT
- TIDAL POOLS
- LAGOON POOLS
- CREATED ACIDIC GRASSLAND ON LANDWARD SIDE OF EASTERN EMBANKMENT
- CREATED NEUTRAL GRASSLAND ON LANDWARD SIDE OF WESTERN EMBANKMENT
- FRESHWATER PONDS/ CREEKS
- INTERTIDAL
- SUB-TIDAL
- SAND LIZARD BUNKERS
- ENHANCEMENT OF RETAINED HABITAT TO PROVIDE LOCALLY EXPOSED SANDY SOIL, FOR HEATH BEE-FLY AND REPTILES
- INDICATIVE LOCATION OF CREATED BOG HABITAT



Data sources: Ordnance Survey

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Scale (at A3): 1:8,000

Status:	Drawn:	Checked:	Authorised:
S2	SR/LG 14/03/2023	PW 14/03/2023	MB 14/03/2023

Reference: ENVIMSW002130-ATK-XX-3XX-DR-EN-000083

Version: **P05**

Environment Agency

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Project: P:\INBLC\DAC Communications\GIS\074_5193244_CDF_ArneMoors_UK\400-Technical Information\403 Working Drawings and 3D Models\W001_IncomingData_SR\002_WIP\ENVIMSW002130-ATK-XX-3XX-DR-EN-000083_CREATED_HABITAT_P05.mxd

West Glamorgan House, 12 Orchard St, Swansea, SA1 5AD.
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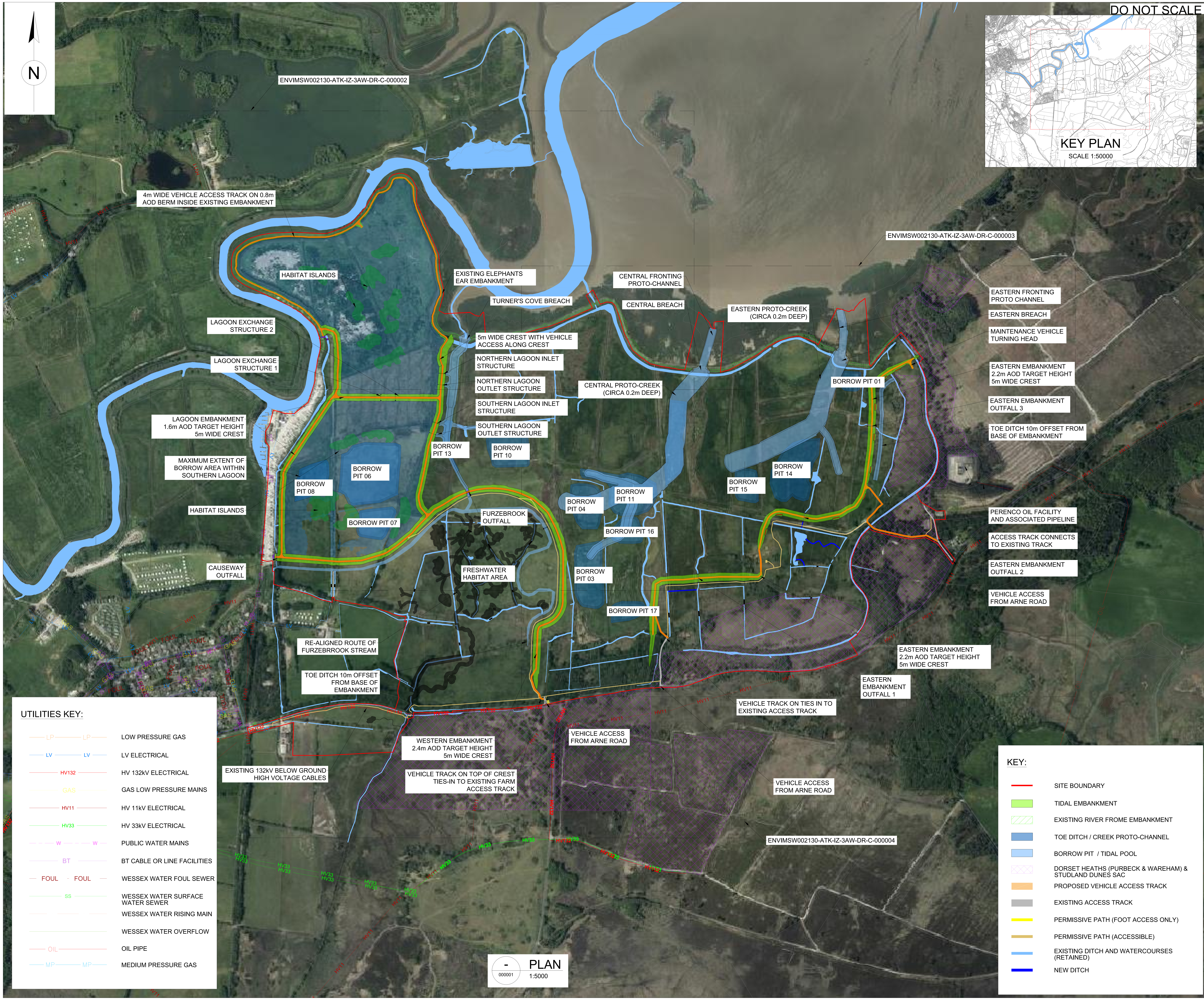
Appendix B. Project Overview Plan



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DO NOT SCALE
KEY PLAN
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ENVIMSW002130-ATK-IZ-3AW-DR-C-000003
ENVIMSW002130-ATK-IZ-3AW-DR-C-000004
4m WIDE VEHICLE ACCESS TRACK ON 0.8m AOD BERM INSIDE EXISTING EMBANKMENT
HABITAT ISLANDS
EXISTING ELEPHANTS EAR EMBANKMENT
TURNER'S COVE BREACH
CENTRAL FRONTING PROTO-CHANNEL
CENTRAL BREACH
EASTERN PROTO-CREEK (CIRCA 0.2m DEEP)
EASTERN FRONTING PROTO CHANNEL
EASTERN BREACH
MAINTENANCE VEHICLE TURNING HEAD
LAGOON EXCHANGE STRUCTURE 2
LAGOON EXCHANGE STRUCTURE 1
5m WIDE CREST WITH VEHICLE ACCESS ALONG CREST
NORTHERN LAGOON INLET STRUCTURE
NORTHERN LAGOON OUTLET STRUCTURE
SOUTHERN LAGOON INLET STRUCTURE
SOUTHERN LAGOON OUTLET STRUCTURE
CENTRAL PROTO-CREEK (CIRCA 0.2m DEEP)
BORROW PIT 01
EASTERN EMBANKMENT 2.2m AOD TARGET HEIGHT 5m WIDE CREST
EASTERN EMBANKMENT OUTFALL 3
TOE DITCH 10m OFFSET FROM BASE OF EMBANKMENT
LAGOON EMBANKMENT 1.6m AOD TARGET HEIGHT 5m WIDE CREST
MAXIMUM EXTENT OF BORROW AREA WITHIN SOUTHERN LAGOON
BORROW PIT 13
BORROW PIT 10
BORROW PIT 06
BORROW PIT 08
BORROW PIT 14
BORROW PIT 15
BORROW PIT 11
BORROW PIT 04
HABITAT ISLANDS
BORROW PIT 07
FURZEBROOK OUTFALL
BORROW PIT 16
PERENCO OIL FACILITY AND ASSOCIATED PIPELINE
ACCESS TRACK CONNECTS TO EXISTING TRACK
EASTERN EMBANKMENT OUTFALL 2
CAUSEWAY OUTFALL
FRESHWATER HABITAT AREA
BORROW PIT 03
VEHICLE ACCESS FROM ARNE ROAD
BORROW PIT 17
RE-ALIGNED ROUTE OF FURZEBROOK STREAM
EASTERN EMBANKMENT 2.2m AOD TARGET HEIGHT 5m WIDE CREST
TOE DITCH 10m OFFSET FROM BASE OF EMBANKMENT
EASTERN EMBANKMENT OUTFALL 1
VEHICLE TRACK ON TIES IN TO EXISTING ACCESS TRACK
VEHICLE ACCESS FROM ARNE ROAD
WESTERN EMBANKMENT 2.4m AOD TARGET HEIGHT 5m WIDE CREST
EXISTING 132kV BELOW GROUND HIGH VOLTAGE CABLES
VEHICLE TRACK ON TOP OF CREST TIES-IN TO EXISTING FARM ACCESS TRACK
VEHICLE ACCESS FROM ARNE ROAD
100m 0m 100m 200m 300m
Scale 1:5000

UTILITIES KEY:

LP —— LP	LOW PRESSURE GAS
LV —— LV	LV ELECTRICAL
HV132	HV 132kV ELECTRICAL
GAS	GAS LOW PRESSURE MAINS
HV11	HV 11kV ELECTRICAL
HV33	HV 33kV ELECTRICAL
W —— W	PUBLIC WATER MAINS
BT	BT CABLE OR LINE FACILITIES
FOUL —— FOUL	WESSEX WATER FOUL SEWER
SS	WESSEX WATER SURFACE WATER SEWER
	WESSEX WATER RISING MAIN
	WESSEX WATER OVERFLOW
OIL	OIL PIPE
MP —— MP	MEDIUM PRESSURE GAS

- PLAN
000001
1:5000

KEY:

- SITE BOUNDARY
- TIDAL EMBANKMENT
- EXISTING RIVER FROME EMBANKMENT
- TOE DITCH / CREEK PROTO-CHANNEL
- BORROW PIT / TIDAL POOL
- DORSET HEATHS (PURBECK & WAREHAM) & STUDLAND DUNES SAC
- PROPOSED VEHICLE ACCESS TRACK
- EXISTING ACCESS TRACK
- PERMISSIVE PATH (FOOT ACCESS ONLY)
- PERMISSIVE PATH (ACCESSIBLE)
- EXISTING DITCH AND WATERCOURSES (RETAINED)
- NEW DITCH

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following:

CONSTRUCTION

A. WORKING CLOSE TO WATERCOURSES - TIDAL ESTUARY,RISK OF DROWNING / COLD WATER EXPOSURE (DRA No. Z01)
B. SOFT GROUND IN DRY AND WET CONDITIONS (DRA No. Z02)
C. HIGH GROUNDWATER IN EXCAVATIONS, RISK OF INSTABILITY AND PLANT BECOMING STUCK. (DRA No. Z03)
D. WHOLE SITE AT RAISED RISK OF TIDAL FLOODING (DRA No. Z04)
E. RAISED UXO RISK ACROSS WHOLE SITE, PARTICULARLY IN EAST OF SITE (DRA No. Z05)
F. EXISTING SERVICE STRIKE. HIGH PRESSURE OIL LINE ADJACENT TO SITE AND RISK OF UNCHARTED SERVICES WITHIN SITE (DRA No. Z06)
G. LIVESTOCK AND WILD ANIMALS (DEER). DEER SHOOTING ON SITE AND IN SURROUNDING AREA (DRA No. Z07 & Z08)
H. EXISTING SITE DRAINAGE FLOWS INTO POOLE HARBOUR. CONTAMINATION RISK FROM CONSTRUCTION WORKS
I. HIGHLY ECOLOGICALLY SENSITIVE AND DESIGNATED SITE (RAMSAR, SAC, SSSI). RISK OF ADVERSE IMPACT TO FLORA AND FAUNA.

MAINTENANCE/CLEANING

AS ABOVE

DECOMMISSIONING/DEMOLITION

AS ABOVE

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER ENGINEERS DRAWINGS AND SPECIFICATIONS.
3. THE POSITION OF ANY EXISTING PUBLIC OR PRIVATE SERVICES, PLANT OR APARATUS SHOWN ON THIS DRAWING IS BELIEVED TO BE CORRECT, BUT NO WARRANTY TO THIS IS EXPRESSED OR IMPLIED. OTHER SUCH PLANT OR APARATUS MAY ALSO BE PRESENT BUT NOT SHOWN. THE CONTRACTOR IS TO UNDERTAKE THEIR OWN INVESTIGATIONS AND IDENTIFY AN APPROPRIATE SAFE SYSTEM OF WORK

Rev.	Date	Description	By	Chk'd	App'd
P02	15/03/21	FOR INFORMATION	LR	CB	CB
P03	07/04/21	FOR INFORMATION	LR	DK	CS
P04	24/02/23	FOR INFORMATION	TR	AM	CS

Drawing Status: FOR INFORMATION
Suitability: S2

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Client: Environment Agency

Project Title: THE MOORS AT ARNE COASTAL CHANGE

Drawing Title: OVERVIEW PLAN

Scale	Drawn	Checked	Reviewed	Authorised
AS SHOWN	TR	KA	AM	CS
Original Size	Date	Date	Date	Date
A1	24/02/23	02/03/23	02/03/23	02/03/23

Drawing Number: ENVIMSW002130-ATK-IZ-3AW-DR-C-000001
Revision: P04

Millimetres 0 10 100

USER: RLTH3790 Date: 02/3/23 12:17:04

Appendix C. Sand Lizard Core Areas and Survey Area Map

C.1. Sand Lizard Core Areas

Existing Tidal Embankment

The existing tidal embankment extends across almost the entire width of the Site and forms its northern boundary, extending approximately 3 km (estimated to be 8 - 12 m in width). Of this approximately 1.2 km was noted as having High[7] suitability for sand lizard. The reasons for this include the south-facing orientation, loosely consolidated surface substrate providing suitability for burrowing, basking and foraging, and the contiguous habitat suitability connecting it to Arne Site of Special Scientific Interest (SSSI). Throughout this document hereafter, this specific survey area is described as the 'existing tidal embankment'.

Eastern Path

A vegetated gravel path extends north-south for approximately 310 m along the eastern Site Boundary. This area was considered to have High habitat suitability for sand lizard. The loose, un-consolidated substrate provides suitability for burrowing, basking and foraging. Furthermore, the path is only separated from Arne SSSI by a small canal (approximately 5 m in width), which provides further suitable habitat. Throughout this document hereafter, this specific survey area is described as the 'eastern path'.

Heathland

Artificial refugia of an unknown origin, comprising Onduline-type, tin and roofing felt typical of targeted reptile surveys, was identified within an area of heathland at the south-eastern extent of the Site, adjacent to Arne Road. The area of heathland was assessed as being of High suitability for sand lizard. Though impacts from the Site in this area are expected to be very low (or completely avoided), survey was considered worthwhile, as artificial refugia was already in place and the efforts may supplement the assessment of sand lizards elsewhere on Site. Throughout this document hereafter, this specific reptile survey area is described as the 'heathland'.

North-eastern Embankment

A raised embankment is located alongside the north-eastern boundary of the Site. This embankment comprises scattered bracken *(Pteridium species*) and tussocks of purple moor grass (*Molinia caerulea*). The embankment is situated west of the canal at the north-eastern extent of Site. This area to the east includes dense gorse scrub, scattered mature and semi-mature Scot's pine (*Pinus sylvestris*) and grey willow (*Salix cinerea*). The edges of the embankment include sandy patches of bare ground with various grass species. The loose, un-consolidated substrate provides suitability for burrowing, basking and foraging. The sandy embankment was assessed as having High suitability to support sand lizards. Furthermore, this area of habitat is well-connected to heathland habitat to the east within Arne SSSI. Hereafter, this specific reptile survey area is described as the 'north-eastern embankment'.

Central Mound

An elevated section comprising species including purple moor grass and soft rush (*Juncus effusus*). Clumps of gorse, of varying age and structure form a major part of the area's vegetation mosaic. Standalone trees are also present including species such as holly (*Ilex aquifolium*) and silver birch (*Betula pendula*). The area comprises a sandy substrate, with bare scrapes present throughout. This is particularly prominent within the basin of the mound where a large excavation occurs. Gorse and exposed sand dominates the fringes of the excavation, where sand lizard have been identified. Hay bales have been present over the course of many years on the mound and are in a state of decomposition. Sand lizard have been observed basking and retreating within the hay bales.

Central-Western Area

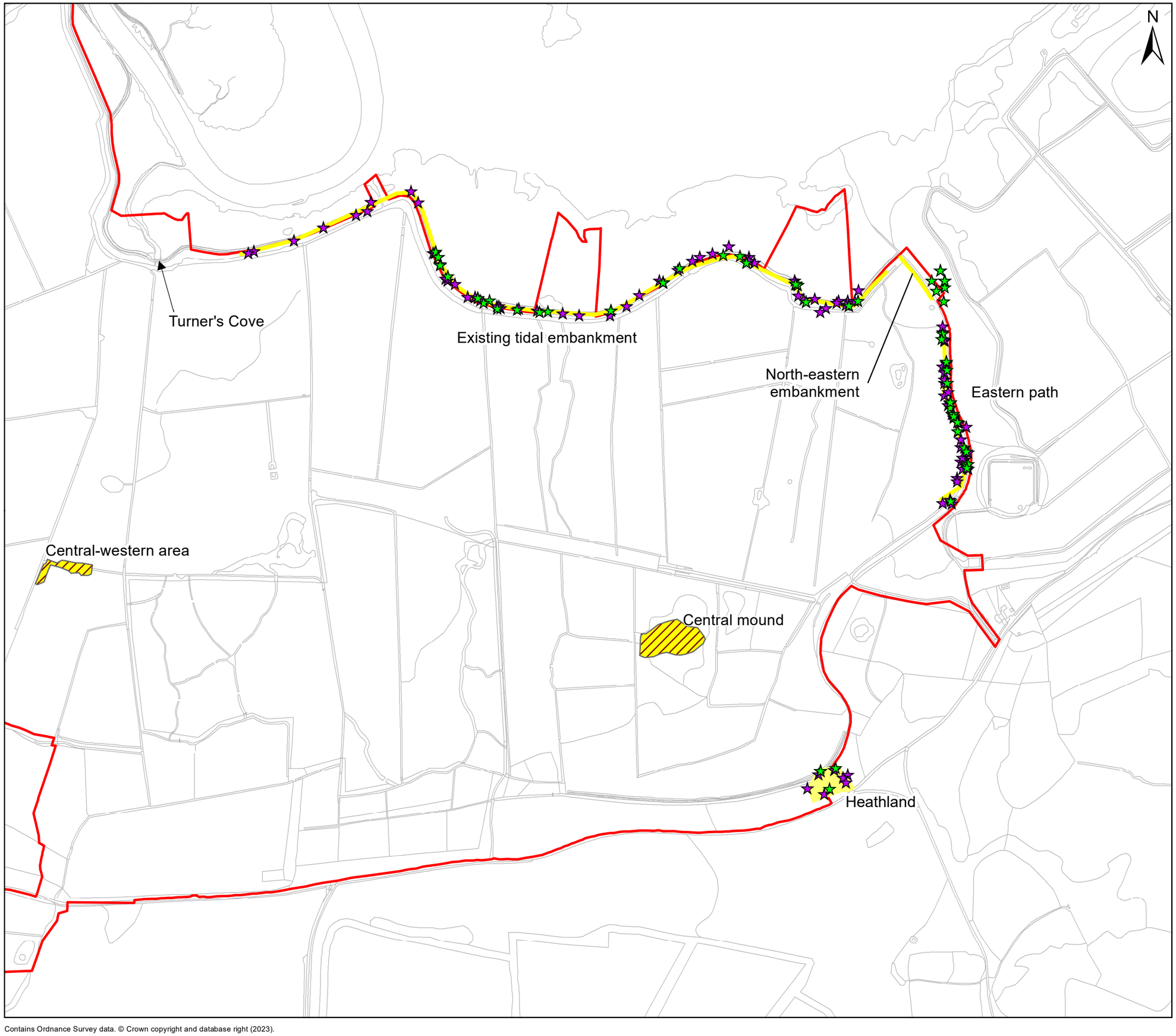
An area of suitable sand lizard habitat comprising a gravel vehicle access track running north to south, adjoined by wet ditches. The gravel access track is gorse-lined, forming an ideal ecotone for basking reptiles. Perpendicular to the access track eastward is another gorse strip lining the wet ditch. Whilst all four common

[7] Reptile habitat suitability classified as per Froglife (1999). *Reptile survey; an introduction to planning, conducting and interpreting surveys for snake and lizard conservation.* Froglife Advice Sheet 10. Froglife, Halesworth

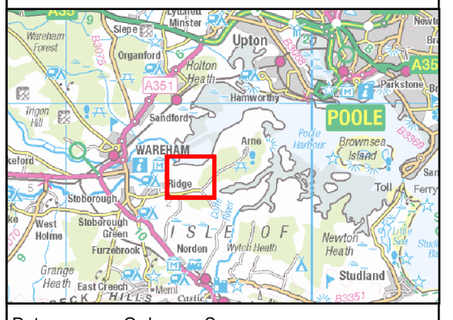
species of reptile have been incidentally recorded within this area, and suitable habitat for sand lizard is present, they have not been identified in this location. Though not particularly sandy, bare, loose, unconsolidated substrate is present along the access track, which would be of suitability to any opportunistic pioneering sand lizards dispersing from core habitats.

CDF-SW-DCS Appraisal The Moors at Arne Coastal Change Project

SAND LIZARD SURVEY AREA MAP



- Site Boundary
- Refugia 2020
- Refugia 2021
- Sand Lizard Survey Area and Suitable Habitat
- Sand lizard suitable habitat (only surveyed as part of egg-laying survey)



Data sources: Ordnance Survey

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Scale (at A3): 1:6,000

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Reference: **ENVIMSW002130-ATK-XX-3XX-DR-EN-0000157**

Version: **P02**

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Appendix D. Sand Lizard Egg-Laying Habitat Survey Results

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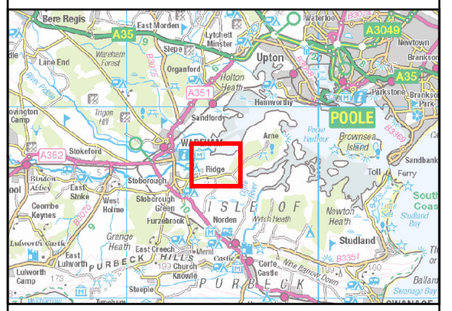
SAND LIZARD HABITAT SUITABILITY ASSESSMENT MAP

N

- Site Boundary
- Habitat Suitable For Sand Lizard Egg-Laying
- Sub-Optimal Habitat Suitable For Sand Lizard Egg-Laying And Hibernation
- Habitat Suitable For Sand Lizard Hibernation
- Indicative Core Foraging Habitat Suitable For Sand Lizard
- Sub Optimal Habitat of Transient or Foraging Suitability Only



Data sources:Ordnance Survey

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Scale (at A3): 1:8,000

Status:	Drawn:	Checked:	Authorised:
S2	SR 27/01/20223	PW 27/01/20223	LS 27/01/20223

Reference: **ENVIMSW002130-ATK-XX-3XX-DR-EN-0000155**

Version: **P02**

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Appendix E. Sand Lizard Habitat Suitability and Habitat Loss Plan

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SAND LIZARD HABITAT SUITABILITY AND HABITAT LOSS PLAN

N

Existing tidal embankment

North-eastern embankment

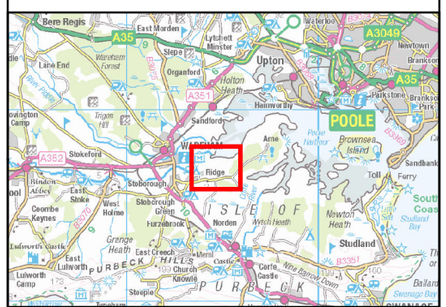
Eastern path

Central-western area

Central mound

Heathlands

- Site Boundary
- Proposed Embankments
- Proposed Toe Ditch
- Proposed Furzebrook Stream Alignment
- Suitable habitat along existing embankment containing areas suitable for egg-laying and hibernation
- Suitable habitat along access tracks to be lost or damaged
- Loss of suitable habitat along ditch networks
- Habitat area suitable for egg laying and hibernation
- Loss of suitable habitat which may include egg-laying and hibernation habitat
- Wider area of habitat loss



Data sources:Ordnance Survey

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Scale (at A3): 1:8,000

Status:	Drawn:	Checked:	Authorised:
S2	SR 14/12/2022	PW 14/12/2022	MB 14/12/2022

Reference: **ENVIMSW002130-ATK-XX-3XX-DR-EN-0000184**

Version: **P01**

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Appendix F. Sand Lizard Presence/ Likely Absence Survey Results

F.1. Results of habitat suitability assessment and sand lizard egg-laying surveys

Table F-1 – Results of habitat suitability assessment and sand lizard egg-laying surveys

Survey Number	Adult	Sub-adult	Juveniles
1	0	2	4
2	3	1	6
3	2	3	7
4	0	6	2

F.2. Results of Presence / likely Absence surveys for sand lizard, including Deployment and Visual Survey

Table F-2 – Results of Presence / likely Absence surveys for sand lizard, including Deployment and Visual Survey

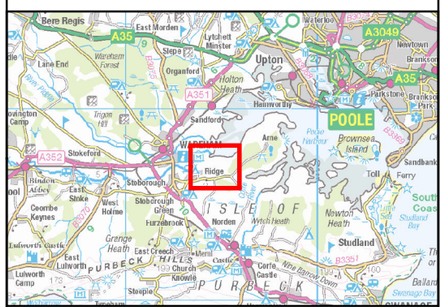
Date	Survey Type	Life Stage						PSCA	Other
		Adult		Sub Adult			Juveniles		
		Male	Female	Male	Female	Unknown			
08/09/2020	Deployment	1	1	0	0	0	3	Low	1 male slough
14/09/2020	Visual survey	0	1	0	0	0	6	Low	N/A
25/09/2020	Refugia check 1	0	0	0	0	0	1	Low	1 female slough
28/09/2020	Refugia check 2	1	0	0	0	0	4	Low	N/A
06/10/2020	Refugia check 3	0	0	0	0	0	4	Low	N/A
12/10/2020	Refugia check 4	1	1	0	0	0	6	Low	N/A
15/10/2020	Refugia check 5	0	0	0	0	0	4	Low	N/A
20/10/2020	Refugia check 6	0	0	0	0	0	1	Low	N/A
27/10/2020	Refugia check 7	0	0	0	0	0	1	Low	N/A
11/05/2021	Refugia check 8	0	1	0	0	1	0	Low	N/A
23/05/2021	Refugia check 9	0	0	0	0	0	0	N/A	N/A

30/05/2021	Refugia check 10	0	0	0	0	0	0	N/A	N/A
01/06/2021	Refugia check 11	0	0	0	0	0	0	N/A	N/A
25/06/2021	Refugia check 12	0	1	0	0	1	0	Low	1 slough
30/06/2021	Refugia check 13	0	0	0	0	0	0	N/A	N/A
05/07/2021	Refugia check 14	0	0	1	0	0	0	Low	1 slough
07/07/2021	Refugia check 15	0	1	0	0	0	0	Low	N/A
24/07/2021	Refugia check 16	0	0	0	0	0	0	N/A	N/A
10/05/2022	Refugia check 17	2	1	0	0	0	0	Low	N/A
17/05/2022	Refugia check 18	1	3	0	0	0	0	Low	N/A
31/08/2022	Refugia check 19	0	1	0	0	0	0	Low	N/A
20/09/2022	Refugia check 20	1	1	0	0	0	0	Low	N/A

CDF-SW-DCS Appraisal
The Moors at Arne Coastal Change Project

SAND LIZARD PRESENCE / LIKELY ABSENCE SURVEY RESULTS 2020, 2021 & 2022

- Site Boundary
- Sand Lizard Survey Records 2020 (September to October)
- Sand Lizard Survey Records 2021 (May to July)
- Unidentified Lizard Species 2021
- Sand Lizard Survey Records 2022 (May, August and September)



Data sources:Ordnance Survey

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Scale (at A3): 1:8,000

Status:	Drawn:	Checked:	Authorised:
S2	SR 15/12/2022	PW 15/12/2022	MB 15/12/2022

Reference: **ENVIMSW002130-ATK-XX-3XX-DR-EN-0000158**

Version: **P02**

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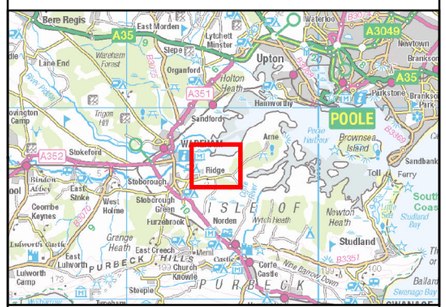
CDF-SW-DCS Appraisal The Moors at Arne Coastal Change Project

SAND LIZARD RECORDS FROM EGG-LAYING HABITAT SURVEYS

- Site Boundary
- Adult Sand Lizard
- Sand Lizard Burrow
- Sand Lizard Hatchling
- Sub-Adult Sand Lizard



Data sources: Ordnance Survey

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Scale (at A3): 1:8,000

Status:	Drawn:	Checked:	Authorised:
S2	SR 25/11/2022	SH 25/11/2022	LS 25/11/2022

Reference: **ENVIMSW002130-ATK-XX-3XX-DR-EN-0000156**

Version: **P01**

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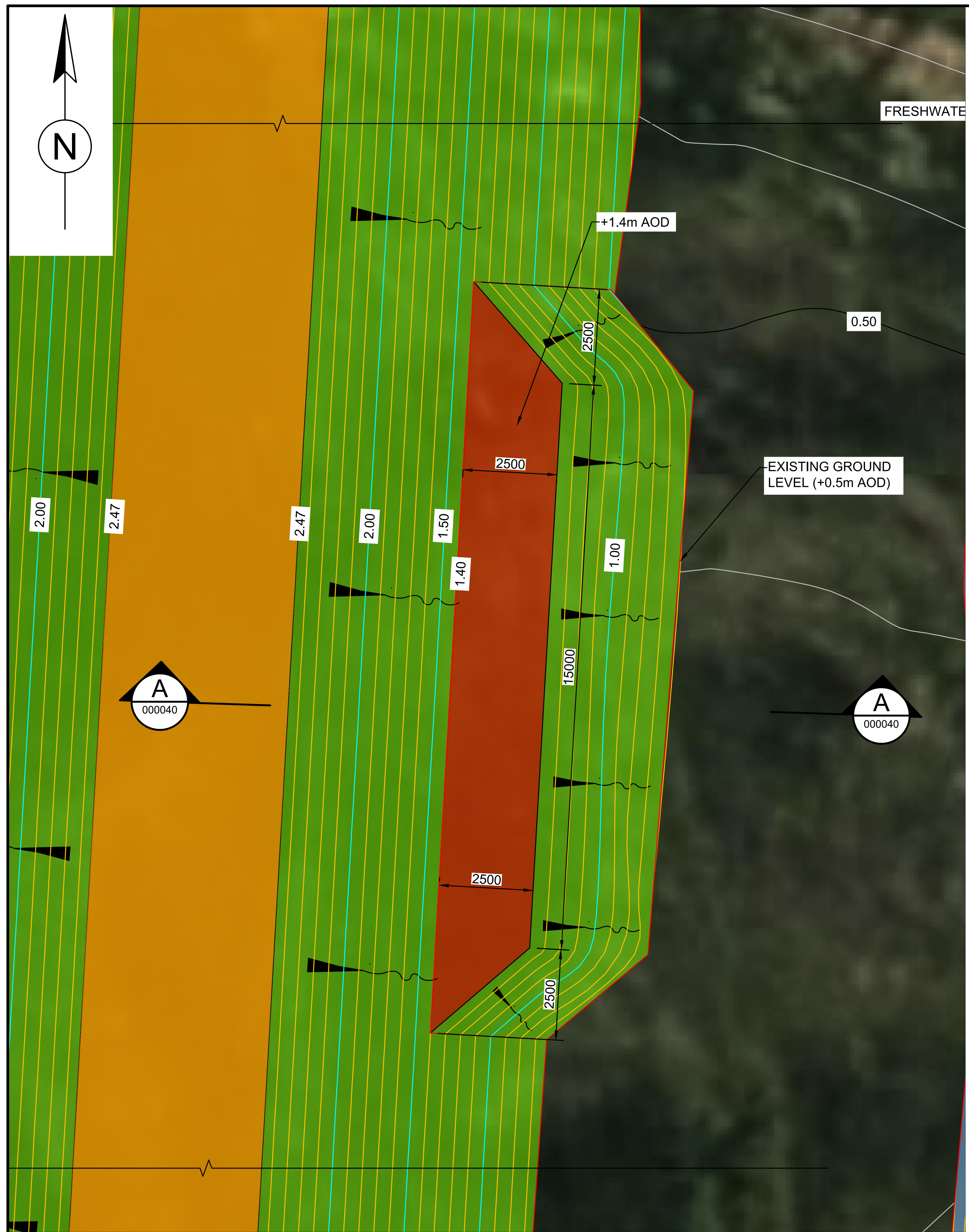
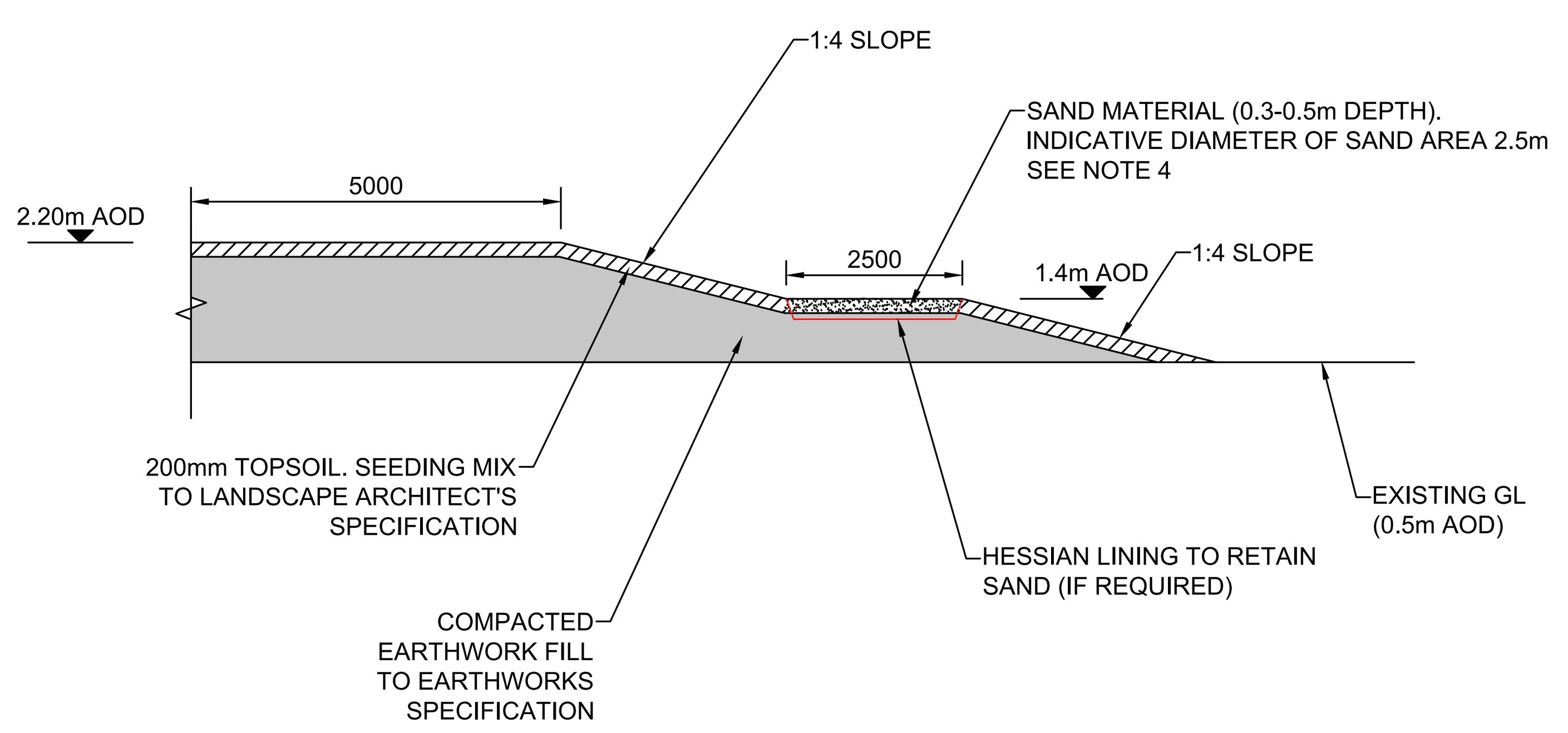
Appendix G. Sand Lizard Habitat Creation

DO NOT SCALE



1 (000040) EMBANKMENT TOE BUNKER PLAN
SCALE 1:100



A (000040) SECTION A-A EMBANKMENT TOE BUNKER SECTION
SCALE 1:100

Scale 1:100

KEY:

- TIDAL EMBANKMENT
- 5m WIDE VEHICLE ACCESS TRACK ON EMBANKMENT CREST
- TOE DITCH
- SAND LIZARD BERM
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following:

CONSTRUCTION

A. SOFT GROUND IN DRY AND WET CONDITIONS (DRA No.Z02)
B. HIGH GROUNDWATER IN EXCAVATIONS, RISK OF INSTABILITY AND PLANT BECOMING STUCK (DRA No.Z03)
C. WHOLE SITE AT RAISED RISK OF TIDAL FLOODING (DRA No.Z04)
D. RAISED UXO RISK ACROSS WHOLE SITE , PARTICULARLY IN EAST OF SITE (DRA No.Z05)
E. EXISTING SERVICE STRIKE. HIGH PRESSURE OIL LINE ADJACENT TO SITE AND RISK OF UNCHARTED SERVICES WITHIN SITE (DRA No.Z06)
F. WORKS ADJACENT TO HIGHWAY APPROPRIATE TRAFFIC MANAGEMENT TO BE IDENTIFIED

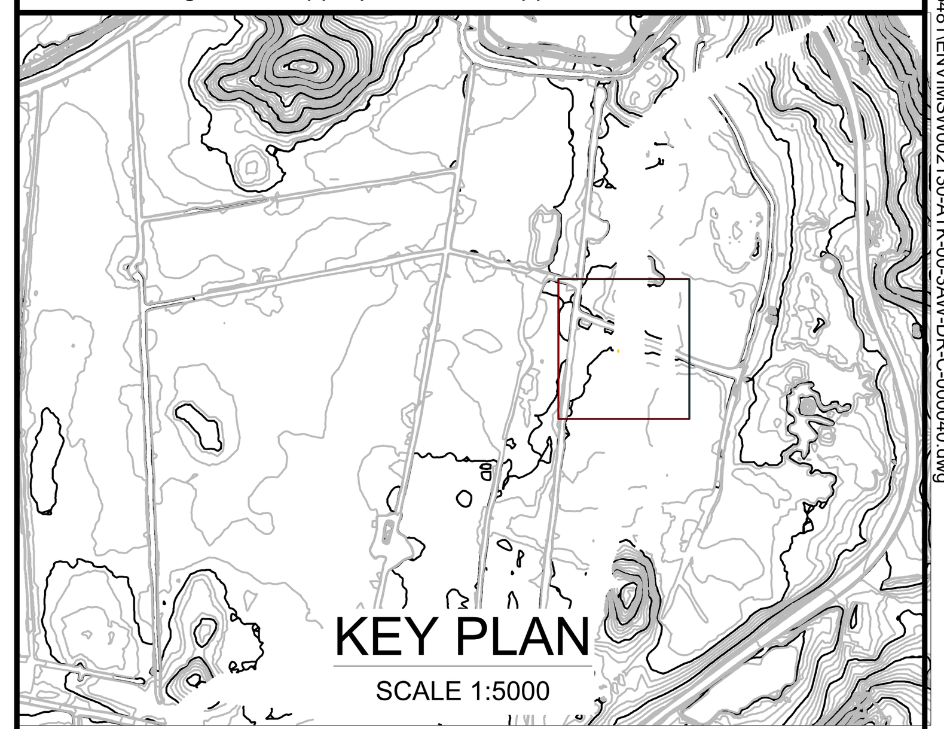
MAINTENANCE/CLEANING

AS ABOVE

DECOMMISSIONING/DEMOLITION

AS ABOVE

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement



KEY PLAN
SCALE 1:5000

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE
2. ALL LEVELS IN METRES ABOVE ORDNANCE DATUM NEWLYN.
3. THE POSITION OF ANY EXISTING PUBLIC OR PRIVATE SERVICES, PLANT OR APARATUS SHOWN ON THIS DRAWING IS BELIEVED TO BE CORRECT, BUT NO WARRANTY TO THIS EXPRESSED OR IMPLIED. OTHER SUCH PLANT OR APPARATUS MAY ALSO BE PRESENT BUT NOT SHOWN.THE CONTRACTOR IS TO UNDERTAKE THEIR OWN INVESTIGATIONS AND IDENTIFY AN APPROPRIATE SAFE SYSTEM OF WORK.
4. SAND BUNKERS TO BE CONSTRUCTED TO ENABLE SLOPING SANDY SUBSTRATE, PROVIDING SUITABLE CONDITIONS FOR EGG-LAYING AND HIBERNATING AND LINED WITH HESSIAN MATERIAL, IF REQUIRED, TO PROMOTE SAND RETENTION.

Rev.	Date	Description	By	Chk'd	App'd
P01	21/02/23	FOR INFORMATION	TR	AM	CS

Drawing Status: FOR INFORMATION
Suitability: S2

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Client: Environment Agency

Project Title: THE MOORS AT ARNE COASTAL CHANGE

Drawing Title: SAND LIZARD HABITAT CREATION

Scale	Drawn	Checked	Reviewed	Authorised
AS SHOWN	TR	AM	AM	CS
Original Size: A1	Date: 21/02/23	Date: 21/02/23	Date: 21/02/23	Date: 21/02/23

Drawing Number: ENVIMSW002130-ATK-00-3AW-DR-C-000040
Revision: P01

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