ECOLOGICAL IMPACT ASSESSMENT

Project Dragon, Port Talbot Docks

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1 INTRODUCTION

1.1 Background

1.1.1 RPS Planning and Development were commissioned by LanzaTech UK Ltd to prepare an Ecological Impact Assessment (EcIA) for the proposed sustainable aviation fuel production facility on land at Crown Wharf, Port Talbot, South Wales (Project Dragon).

1.1.2 The assessment reports on the baseline conditions for terrestrial ecology, and the significance of the predicted environmental effects a result of development activities in a geographical context taking into account avoidance, mitigation and compensation incorporated into the site design.

1.1.3 The assessment also details further measures that will be required to prevent, or reduce effects, or to provide beneficial enhancement.

1.1.4 The conclusions are provided both in terms of the residual effects and their geographic significance taking into account both primary and tertiary mitigation.

1.1.5 The EIA Study Area Boundary includes a section of the open water dock outside of the planning application site boundary. In the EcIA the open water dock has only considered in relation to bird activity. All elements of the marine environment are addressed separately in Chapter 7 of the Environmental Statement.

1.2 Site Description

1.2.1 The Proposed Scheme comprises a new facility for the production of sustainable aviation fuel in the form of Alcohol to Jet Synthetic Paraffinic Kerosene (ATJ SPK and diesel), using technology and processes developed by the Applicant.

1.2.2 In this report the 'Site' refers to most of the planning application boundary comprising the permanent development and temporary construction areas. The marine area and works to Phoenix Way are dealt with separately throughout. The planning application boundary areas are defined on Figure 1 the Development Areas Plan (ECO2340-0001_03) and in total are 17.98 hectares in extent.

1.3 Study Area Location and Context

1.3.1 The Site is located within the Port Talbot Docks landholding. The main proposed development area is located to the south of Crown Wharf and is referred to as the Production Development Zone (PDZ). It is approximately 9.5ha and comprises regenerating willow scrub and very extensive stands of Japanese knotweed (JKW) which extend into the adjoining scrub and are encroaching into grassland. There are few areas within the PDZ where Japanese knotweed (JKW) plants are not present. A large area of sparsely vegetated bare ground (hardstanding) lies in the centre relating to ground that was left after the demolition and removal of the previous development.

1.3.2 A strip of land adjoining the open water dock lies to the north of the PDZ and is referred to as Crown Wharf. The section of Phoenix Way between Crown Wharf and the PDZ also lies within the Site.

1.3.3 The proposed Marine Loading Facility is located at Crown Wharf within the open water dock to the north of the PDZ. Planning permission is not being sought for the Marine Loading Facility. The detailed design of the facility is being finalised. The facility will be the subject of a separate Marine Licence in the coming months, but the parameters of the facility set out in Chapter 4 of the Environmental Statement and movements to and from it, have been considered in relation to the potential impacts to birds, in this assessment.

1.3.4 The Temporary Construction Areas (TCAs) are located within the wider Port Talbot Docks, and measure approximately 7.44ha in total.

1.3.5 Temporary Construction Area (TCA1) is located in part of Margam Wharf, a previously developed parcel of land adjoining the eastern boundary of the open water dock. It is an area that was an active operational area in the recent past and supports a mosaic of bare ground, ephemeral vegetation and naturally regenerating grassland with scattered native and non-native scrub.

1.3.6 Two further temporary construction areas (referred to as TCA East and TCA West) are included in the planning application boundary. Baseline data collection and analysis is currently ongoing for the two additional TCAs. This version of the EcIA report excludes any evaluation or assessment of the effects in these areas. This will be included in the final EcIA at planning application stage, for completeness.

1.3.7 A disused railway siding bounds is located to the south of the PDZ, beyond which lie the extensive operational areas of the Tata Steel Steelworks. The boundary of the site at Crown Wharf is aligned to the southern edge of the open water dock.

Wider Docks

1.3.8 The PDZ forms the eastern section of a c41ha of post-industrial land referred to as the Harbourside which has been subject to ecology surveys in the past as part of baseline studies for a prospective future development proposal by ABP. Whilst not directly related to Project Dragon, the survey outcomes have helped inform an understanding of the detailed nature of habitats on the Harbourside and their status. The surveys are also helpful in understanding the presence of protected species and any common characteristics across the wider Harbourside area.

1.3.9 For the purposes of the survey work in 2021, the Harbourside site was subdivided into five areas, (Areas A, B, C West, C East and D) based on their character and geographic context. These areas are illustrated on Figure 3. Area D is largely aligned to the extent of the PDZ. It was subject to habitat survey in 2021 but was not covered by the Phase 2 species surveys undertaken at this time.

1.3.10 Area A is a broadly triangular area of level ground with open structured naturally regenerating grassland growing on a post-industrial substrate comprises in part steel slag waste.

1.3.11 Area B is a former mineral extraction and has a varied topography reflecting its history with mounds, banks, ramps, low lying depressions and bunds. The lowest lying area in the centre of the former extraction flooded after operations ceased and has developed into a reedbed (approximately 1ha in extent) over the last 10 years.

1.3.12 Area C (West) is a flat area of ground with a low bund on the northern boundary adjoining Phoenix Way. Post-industrial substrates with minimal soil support open grassland and flower-rich ephemeral vegetation is similar to Area A, with more established grassland, and scattered scrub in the eastern section. An artificial sand martin nest bank is located in the centre of this area below the elevated conveyor in the Tata operational site.

1.3.13 Area C (East) adjoins the western boundary of the PDZ. It has a varied undulating topography encompassing habitats that have established on and alongside historic railway embankments, and old trackway with a steep back forming the boundary with the Tata steelworks beyond the southern boundary.

1.3.14 An enclosed harbour defined by harbour walls with a central deep-water berth lies to the west of the Harbourside site. The harbour has shallow sloping stony / rocky foreshore with a strip of open grassland between the foreshore and internal port road.

1.3.15 The internal section of the River Afan lies to the north-west of the open water dock where it flows into Swansea Bay beyond the harbour wall and breakwaters.

ABP Management Works: Japanese knotweed Eradication / Advanced Reptile Relocation

1.3.16 A port-wide Japanese knotweed (JKW) Control Strategy is being prepared on behalf of Associated British Ports (ABP) for the whole of the port landholding with support from specialist contractors who are advising on the best practical options. The JKW strategy (and associated advanced reptile relocation – see below) is being carried out in agreement between JKW and the Council. It is not directly related to Project Dragon but does form part of the landowner works to address the substantial presence of the invasive species at Harbourside. The eradication of the species is a significant community benefit and will support the future development aspirations at Harbourside, including Project Dragon.

1.3.17 Japanese knotweed has been present across on ABP's landholding, including the PDZ, for many years and now forms very extensive stands. Further stands of Japanese knotweed occur in a number of other locations within Port Talbot Docks. The first phase of the control strategy includes targeted actions, being completed under permitted development rights by ABP, at the eastern section of Harbourside site where the Japanese knotweed is most extensive. This includes land falling within the boundary of the PDZ.

1.3.18 Targeted measures are being taken to reduce the vigour of the plants. Due to the spread of Japanese knotweed within other habitats, woody scrub, bramble and dead JKW stems were cut back to ground level in late winter 2023 in order to fully assess the extent of the stands and to create full access for management. Crown stripping originally programmed for spring/summer 2023 has been delayed until autumn 2023/spring 2024. In addition, other JKW stands present in the wider docks are due to be subject to herbicide treatment in early autumn 2023 as the first year of the implementation of the strategy.

1.3.19 In advance of crown stripping, ABP are undertaking a relocation of the three native reptile species present; common lizard *Zootoca vivipara*, grass snake *Natrix Helvetica*, and slow worm *Anguis fragilis*.

1.3.20 ABP have defined the wider Harbourside site as a Temporary Reptile Mitigation Area for the relocation of these species in summer/autumn 2023. This area will be maintained as a Temporary Reptile Mitigation Area ahead of a permanent relocation of reptile populations (including reptiles relocated from the Site) to a created off-site receptor by ABP. These proposals will establishing new populations in the county on suitably sited land allocated by ABP.

1.3.21 The reptile surveys in 2021 confirmed the presence of populations of the three reptile species in the wider Harbourside site with the distributions reflecting differences in habitat quality / suitability.

1.3.22 ABP are increasing the quality of low value areas in the Temporary Reptile Mitigation Area through selected habitat creation and enhancement. These measures extend across Area A, B and C and include creating new grassland and creating patchworks in areas of uniform rank grassland and dense bracken. A large number of log piles, brash piles and hibernacula have been created across the Harbourside site adjacent to the areas of habitat manipulation. These measures will create additional reptile habitat and provide release locations for relocated reptiles.

1.3.23 Based on the results of the reptile survey for the PDZ, it is anticipated that a medium sized population of common lizard and small populations of slow-worn and grass snake will be relocated into the Temporary Reptile Mitigation Area.

1.3.24 ABP are also in the process of defining and creating permanent off-site reptile receptor habitats to provide compensation sites for the Future Port Talbot developments across the docks. It is anticipated that all the reptiles moved into the Temporary Reptile Mitigation Area will be permanently translocated to agreed off-site receptor habitats. ABP will be preparing a detailed strategy for the permanent translocation of reptile populations. The requirements of the individual species will be built into the design specifications for the release site/s and targeted habitat creation, manipulation and enhancement will be completed ahead of the translocations.

1.3.25 In the interim the Temporary Reptile Mitigation Area will be managed by ABP to maintain is value for reptiles re-instating habitat patchworks in early spring each year and ensuring the continued functionality of the log piles and hibernacula.

1.3.26 The effects on reptile populations following the ABP relocation are referenced in the assessment of residual impacts. The implementation of reptile mitigation and conservation in the wider Harbourside site falls outside the control of the Applicant.

1.4 Planning Policy and Legislation Context

Planning Policy

1.4.1 The following national and local planning policy documents and guidance are relevant to the proposed development, and are described briefly in the sections below with reference to the particular sections applicable to nature conservation and biodiversity:

- Planning Policy Wales11
- Technical Advice 5: Nature Conservation and Planning;
- The Nature Recovery Plan for Wales 2020;
- Neath Port Talbot Nature Recovery Plan
- Neath Port Talbot Biodiversity Duty Plan 2017
- • Neath Port Talbot Council Biodiversity and Geodiversity Supplementary Planning Guidance 2018;
- • The Nature Recovery Plan for Wales 2020;
- • Neath Port Talbot Nature Recovery Plan;
- • Biodiversity Duty Plan 2017;
- • Action Plan for Pollinators in Wales; and
- Future Wales – The National Plan 2040.

Planning Policy Wales

1.4.2 PPW Edition 11 (Welsh Government, 2021) provides a national policy framework for Wales. Chapter 6 of PPW covers 'Distinctive and Natural Places'. The following objectives are listed in paragraph 6.4.3 of the document, of which all are relevant:

- *'Support the conservation of biodiversity, in particular the conservation of wildlife and habitats;*
- *Ensure action in Wales contributes to meeting international responsibilities and obligations for biodiversity and habitats;*
- *Ensure statutorily and non-statutorily designated sites are properly protected and managed;*
- *Safeguard protected and priority species and existing biodiversity assets from impacts which directly affect their nature conservation interests and compromise the resilience of ecological networks and the components which underpin them, such as water and soil, including peat; and*
- *Secure enhancement of and improvements to ecosystem resilience by improving diversity, condition, extent and connectivity of ecological networks.'*

1.4.3 The Biodiversity and Resilience of Ecosystems Duty (Section 6 Duty) contained within the PPW states the '*Planning authorities must seek to maintain and enhance biodiversity in the exercise of*

their functions. This means development should not cause any significant loss of habitats or populations of species, locally or nationally and must provide a net benefit for biodiversity. In doing so planning authorities must also take account of and promote the resilience of ecosystems, in particular the following aspects: diversity between and within ecosystems; the connections between and within ecosystems; the scale of ecosystems; the condition of ecosystems including their structure and functioning; and the adaptability of ecosystems.'

Technical Advice Note 5: Nature Conservation and Planning

1.4.4 Technical Advice Note (TAN) 5 (Welsh Assembly Government, 2009) provides advice about how the land use planning system should contribute to protecting and enhancing biodiversity and geological conservation. The TAN provides advice for local planning authorities on:

- the key principles of positive planning for nature conservation
- nature conservation and Local Development Plans
- nature conservation in development management procedures
- development affecting protected internationally and nationally designated sites and habitats
- development affecting protected and priority habitats and species.

1.4.5 Reference is made to developments implementing the Mitigation Hierarchy: avoidance; mitigation; compensation and enhancement.

1.4.6 Enhancement measures (designed to ensure net biodiversity benefit) need to be defined separately from the mitigation and compensation measures being implemented as part of the development proposal to ensure no net loss.

Local Planning Policy

1.4.7 The site of the development is located within the administrative area of NPTCBC. The ecological assessment reported in this chapter has had regard to the following local policy documents.

1.4.8 Relevant local planning policies from the Neath Port Talbot Local Development Plan 2011-2026 (Neath Port Talbot 2016) have been considered in the assessment. The key planning policies relevant to ecology and nature conservation are set out below.

1.4.9 Policy EN 6 Important Biodiversity and Geodiversity Sites Development proposals that would affect Regionally Important Geodiversity Sites (RIGS), Local Nature Reserves (LNRs), Sites of Interest for Nature Conservation (SINCs), sites meeting SINC criteria or sites supporting Local Biodiversity Action Plan (LBAP) or S42 habitats or species will only be permitted where: 1. They conserve and where possible enhance the natural heritage importance of the site; or 2. The development could not reasonably be located elsewhere, and the benefits of the development outweigh the natural heritage importance of the site. Mitigation and/or compensation measures will need to be agreed where adverse effects are unavoidable.

1.4.10 Policy EN 7 Important Natural Features Development proposals that would adversely affect ecologically or visually important natural features such as trees, woodlands, hedgerows / field boundaries, watercourses or ponds will only be permitted where: 1. Full account has been taken of the relevant features in the design of the development, with measures put in place to ensure that they are retained and protected wherever possible; or 2. The biodiversity value and role of the relevant feature has been taken into account and where removal is unavoidable, mitigation measures are agreed.

1.4.11 Policy SP 16 Environmental Protection Air, water and ground quality and the environment generally will be protected and where feasible improved through the following measures: 1. Ensuring that proposals have no significant adverse effects on water, ground or air quality and do

not significantly increase pollution levels; 2. Giving preference to the development of brownfield sites over greenfield sites where appropriate and deliverable; 3. Ensuring that developments do not increase the number of people exposed to significant levels of pollution.

Biodiversity and Geodiversity Supplementary Planning Guidance 2018

1.4.12 Neath Port Talbot's Biodiversity and Geodiversity Supplementary Planning Guidance (SPG), 2015 provides specific direction on how biodiversity should be conserved and enhanced throughout the development control process, whilst drawing on national planning policy, and the policies contained in the Development Plan. Biodiversity must be actively considered by all development proposals.

1.4.13 The SPG sets out a basic framework for dealing with biodiversity and geodiversity in the planning process.

1.4.14 Para 3.2.8 states that *Policy EN 6 sets out the requirements for developments that would affect regionally and locally designated sites, habitats and species. Planning proposals that would not conserve or enhance the natural heritage importance of the site would need to comply with criterion 2 of the policy (i.e. show that the development could not reasonably be located elsewhere and the benefits of the development would outweigh the natural heritage importance of the site).*

1.4.15 Para 3.2.9 states that *In cases where it is demonstrated that criterion 2 applies, the policy requires appropriate mitigation and/or compensation measures to be agreed and implemented. Only where full mitigation is not possible will compensation measures be considered, firstly within the site and, as a last resort, on a suitable site elsewhere.*

1.4.16 Para 2.2.9 states that *Whilst development can significantly impact upon biodiversity across the County Borough through direct loss of habitats and their associated species, disturbance on and off-site, and habitat fragmentation causing species isolation and the prevention of genetic exchange, it can also afford opportunities to enhance biodiversity and reverse previous damage, as well as to avoid net losses through careful planning and design.*

1.4.17 Para 5.1.23 states that *As a last resort, where loss of biodiversity is unavoidable despite mitigation, compensation for the residual loss will need to be agreed and implemented. Compensation will only be considered for developments that can demonstrate that all avoidance and mitigation measures have been investigated first.*

1.4.18 Policies reference the 'Step-Wise Approach' to decision making relating to the provision of biodiversity as part of developments in the following order.

- Safeguarding existing important habitats/species and maintaining ecological connectivity
- designing additional biodiversity features into the development proposal.
- adoption of mitigation to reduce the effects
- provision of on-site compensation where effects cannot be mitigated
- Provision of off-site compensation where measures cannot be accommodated on-site.

1.4.19 Measures to enhance and increase the biodiversity of the site need to be identified separately from mitigation/compensation and a quantitative assessment of biodiversity net loss is required for each important feature.

Action Plan for Pollinators in Wales

1.4.20 The Action Plan for Pollinators in Wales (Welsh Government, 2013) recognises that:

'Pollinators are an essential component of our environment. Honeybees and wild pollinators including bumblebees, solitary bees, parasitic wasps, hoverflies, butterflies and moths and some beetles are important pollinators in Wales, for crops such as fruit and oil seed rape, clovers and other nitrogen fixing plants that are important to improving the productivity of pasture systems for livestock grazing, and wildflowers.'

1.4.21 It recognises the value of pollination as a contribution to the UK crop market and that bee and pollinator health and declining populations have been increasingly highlighted as a cause for concern in the UK and globally. The Welsh Government has thus worked with industry and stakeholders to look in more detail at the evidence and issues around pollinators and their conservation in Wales. The plan describes the current situation in Wales and identifies areas where action is needed. It details the Welsh Government's Vision for Pollinators in Wales and puts that into the context of the Welsh Government's priorities and policies. It also lays out an Agenda for Action comprising the outcomes and areas for action that have been identified and how the Welsh Government will work towards them.

Relevant Legislation and Guidance

1.4.22 The following relevant UK legislation has been considered within this assessment:

- The Conservation of Habitats and Species Regulations 2017.
- The Environment (Wales) Act 2016.
- The Countryside and Rights of Way Act 2000.
- Wildlife and Countryside Act 1981 (as amended).
- The Natural Environment and Rural Communities (NERC) Act 2006.
- The Well-being of Future Generations Act (Wales) 2015.

1.4.23 The EC Directives 2009/147/EC on the Conservation of Wild Birds (the Birds Directive) and 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive) are implemented in the UK principally through the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017.

1.4.24 All wild birds, their nests and eggs are protected under Part 1, Section 1 of the Wildlife and Countryside Act. Birds listed in Schedule 1 of this Act are subject to special protection. Wild animals listed in Schedule 5 received full legal protection and plants listed in Schedule 8 are also under this Act.

1.4.25 Highly invasive non-native plant species are listed under Schedule 9 of the Act.

1.4.26 Where species protected by the regulations would be affected by development, a licence may be granted subject to tests set out in section 55 of the Regulations. These are that:

1) the licence must be necessary for reasons of preserving public health or public safety or other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment;

2) there is no satisfactory alternative; and

3) the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

1.4.27 The Well-being of Future Generations (Wales) Act 2015 includes a number of well-being goals (Part 2 Section 4), the second of which is 'A resilient Wales' described as:

1.4.28 ‘A nation which maintains and enhances a biodiverse natural environment with healthy functioning ecosystems that support social, economic and ecological resilience and the capacity to adapt to change (for example climate change).’

1.4.29 Part 2 Section 3 of the Act places a well-being duty on public bodies (which include the Welsh Ministers) requiring that:

‘(1) Each public body must carry out sustainable development.

(2) The action a public body takes in carrying out sustainable development must include—

(a) setting and publishing objectives (“well-being objectives”) that are designed to maximise its contribution to achieving each of the well-being goals, and

(b) taking all reasonable steps (in exercising its functions) to meet those objectives.……’

1.4.30 The Environment (Wales) Act 2016 includes measures to provide an integrated natural resource management process to deliver the sustainable management of natural resources. That means the collective actions (including non-action) required for managing the maintenance, enhancement and use of natural resources in a way, or at a rate, which enables people and communities to provide for their social, economic and environmental well-being in Wales.

1.4.31 The Act requires public bodies to co-operate, share information, jointly plan for and jointly report on the management of natural resources, of which climate resilience and climate mitigation are key strands.

1.4.32 Section 6 of the Act sets out a biodiversity and resilience of ecosystems duty and replaces Section 40 of the Natural Environment and Rural Communities Act 2006. This applies to a range of public authorities such as the Welsh Ministers, local planning authorities and public bodies. This ensures that biodiversity is an integral part of the decisions that public authorities take in Wales. It also links biodiversity with the long-term health of ecosystems and aligns to the framework for sustainable natural resource management in the Act. The Act requires all public authorities in Wales to report on the actions they are taking to improve biodiversity and promote ecosystem resilience.

1.4.33 In regard to promoting the resilience of ecosystems, the Welsh Government must in particular have regard to the United Nations Environmental Programme Convention on Biological Diversity 1992.

1.4.34 Section 7 of the Act requires the Welsh Government to prepare and publish a list of the living organisms and types of habitat which in their opinion are of principal importance for the purpose of maintaining and enhancing biodiversity in relation to Wales, and to take measures to maintain and enhance these species and habitats. Hereafter these are referred to as’ Section 7 Species’ or ‘Section 7 Habitats’.

1.4.35 Section 6.4.3 of Planning Policy Wales states that:- ‘The planning system has a key role to play in helping to reverse the decline in biodiversity and increasing the resilience of ecosystems, at various scales, by ensuring appropriate mechanisms are in place to both protect against loss and to secure enhancement.’ so that each development achieves Net Benefits for Biodiversity (NBB) with the emphasis on proactive consideration of biodiversity and wider ecosystem benefits being integrated into site layout and design. Development proposals should demonstrate how decisions on design, siting, scale density and other key considerations have been informed by biodiversity and ecosystem resilience considerations as defined by diversity, extent, condition, connectivity and adaptability.

2 METHODS

2.1 Baseline Surveys

2.1.1 The baseline ecological conditions have been assessed for the PDZ, Temporary Construction Area, the Marine Unloading/Loading Facility and Phoenix Way Supporting Infrastructure.

2.1.2 A Phase 1 Habitat survey covering these areas was undertaken in summer 2022. The survey followed the standard methodology (JNCC, 2016), and as described in the Guidelines for Preliminary Ecological Assessment (CIEEM, 2017). The report is presented in Appendix A of this report.

2.1.3 Each of the habitats have been classified, mapped and described in terms of their structure and botanical species composition.

2.1.4 The following species surveys have been completed in 2022 and early 2023:

- Bat activity surveys – transects and remote recording (PDZ, TCA1, Crown Wharf);
- Reptile presence/absence surveys (PDZ, TCA1, Crown Wharf);
- Targeted surveys for badger (PDZ, TCA1, TCA West, Crown Wharf);
- Surveys to assess presence/absence of otter (PDZ, TCA1, Crown Wharf);
- Bryophyte assessment (PDZ, TCA1)
- Great crested newt assessment (Land within 250m of PDZ, TCA1, Crown Wharf); and
- Overwintering bird surveys (open water dock adjoining Crown Wharf and TCA1)

2.1.5 The results of these surveys area presented in the following reports:

- Phase 2 Species Surveys Report (Appendix B) covering bats, reptiles, badger, otter and great crested newts
- Bryophyte assessment (Appendix C)
- Breeding and overwintering bird survey (Appendix D)

Past Surveys

2.1.6 A series of surveys were completed for the Harbourside site (Areas A-C) in 2021. This included a breeding bird survey, wintering bird survey, and terrestrial invertebrate survey. Due to the ongoing works to control/remove the extensive stands of JKW by the landowner, Associated British Ports (ABP), full surveys for these species groups could not be completed in 2023.

2.1.7 Therefore precautionary assessments have been completed for breeding birds and invertebrates, based on the habitat types that were present prior to the initiation of JKW control works, and findings of the 2021 survey data collected for equivalent habitats in the wider Harbourside site. The results of these precautionary assessments are included as part of the Breeding and Overwintering Bird Survey (Appendix D) and form the Invertebrate Assessment (Appendix E).

2.2 Assessment Methodology

2.2.1 The report follows the Charted Institute of Ecology & Environmental Management CIEEM guidance of the preparation of Ecological Impact Assessments (EcIA).

2.2.2 The assessment identifies sites, habitats, species and other ecological features that are of value based on factors such as legal protection, statutory or local site designations such as Sites of Special Scientific Interest (SSSI) or Local Wildlife Sites (LWS) or inclusion on Red Data Book Lists or listed as a Section 7 habitat or species under the Environment (Wales) Act 2016.

2.2.3 Each habitat or species population or assemblage has been assigned a value with reference, its distribution and status (including a consideration of trends based on available historical records) taking into account its rarity and vulnerability. This evaluation of the ecological importance is in accordance with the following scale following the CIEEM guidance:

- International;
- UK;
- National (Wales);
- Regional;
- County;
- District;
- Local/Parish; and/or
- Site and immediate vicinity

2.2.4 The EcIA sets out the potential direct and indirect effects arising from the development; taking into the final scheme design including landscaping, and SuDS.

2.2.5 The magnitude and nature of an impact on a habitat or species has been assessed with reference to the extent; magnitude; duration; reversibility; timing and frequency of the effects on the integrity of the ecological receptor. The assessment also considered the wider effects on ecosystem structure, function, and their future resilience.

2.2.6 The likely impacts of the Proposals have been assessed in terms of the:

- type of impact i.e. whether the Proposals would result in a beneficial or adverse impact on the identified IEFs;
- magnitude of the impact, (size or intensity measured in relevant terms e.g. numbers of individuals lost or gained, area of habitat lost or created);
- extent or spatial scope of the impact;
- likely duration of the impact;
- reversibility of the impact – whether the effect is naturally reversible or reversible through mitigation action; and
- timing and frequency of the impact, in relation to ecological changes.

2.2.7 Table 7.3 below indicates how the magnitude of impacts has been described within this assessment, taking into account guidance provided in CIEEM (2018).

Table 2.1: Definitions of Magnitude

Magnitude	Typical Descriptors
High	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements (Adverse).
	Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality (Beneficial).
Medium	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements (Adverse).
	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality (Beneficial).
Low	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements (Adverse).
	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring (Beneficial).
Negligible	Very minor loss or detrimental alteration to one or more characteristics, features or elements (Adverse).
	Very minor benefit to or positive addition of one or more characteristics, features or elements (Beneficial).
No change	No loss or alteration of characteristics, features or elements; no observable impact in either direction.

2.2.8 The significance of the effects on the identified features have been assessed taking into account the value of the sites, habitats and species that would be affected and the predicted magnitude of impact. The nature of the effects has been classified as adverse or beneficial at a geographic scale or as a neutral effect.

2.2.9 Additional measures proposed to address potential adverse effects are defined including proposals outside of the Site.

2.2.10 The predicted significance of the residual effects has been defined with reference to the full implementation of all the proposed additional measures and commitments during construction and over the operational life of the development.

2.2.11 For the purposes of the assessment the following timeframes are referred to in relation to the duration of effects and/or the time required for mitigation measures to become effective:

- Short-term: Up to one year.
- Medium-term: Between 1 and 10 years.
- Long-term: greater than 10 years.

3 BASELINE ENVIRONMENT

3.1 Designated Sites

3.1.1 There are three international statutory designated sites within 10km of the application site boundary Kenfig SSSI/NNR/SAC located 5km to the south; Crymlyn Bog and Pant y Sais SSSI/NNR/SAC located 6.6km to the north of the site; and Cefn Cribwr SSSI/SAC, 9.5 km to the south-west of the Site

3.1.2 There are no other national statutory designated sites within 2km; the closest being Margam Moor SSSI, located 3.5km to the south, beyond the Tata steelworks.

3.1.3 Five non-statutory Sites of Interest to Nature Conservation (SINC) are located within 2km of the application site.

3.1.4 The Lower River Afan Estuary SINC is 6.63ha adjoining the open water dock, located 690m to the west of the PDZ and 580m west of the TCA West at the closest points. It is primarily designated for the coastal saltmarsh and intertidal mudflats and the population of sea stock *Matthiola sinuate*. The Lower River Afan also lies with the NPT Watercourses SINC which is an extensive designation covering the watercourses and waterways across the county borough covering coastal, urban and industrial areas including those around the steelworks and docks.

3.1.5 Little Warren SINC is 1.47ha and lies to the north of the mouth of the River Afan. 1km from the PDZ and 930m from TCA West. It is designated for its coastal sand-dunes with associated slacks, seepages, grassland, and scrub habitat along with an important population of sea stock. This SINC is connected to Lower River Afan Estuary SINC and the Baglan Bay Dune System SINC to the north.

3.1.6 Harbourside Law Courts SINC is a 3.04ha brownfield site supporting Open Mosaic Habitats on Previously Developed Land designated and the associated populations of plants, invertebrates, reptile and birds. This SINC lies 625m from both TCA1 and the PDZ.

3.1.7 Bryn Goytre Cycleway SINC is a 2.5 mile linear section of disused railway line in the Cwm Dyffryn Valley, over 1.3km to the east of the Site at the closest point. The SINC is primarily designated for the ancient sessile-oak/birch woodland supporting abundant ferns and a suite of ancient woodland Indicators.

3.1.8 NPT Watercourses SINC is an extensive designation covering all watercourses and waterways across the county covering coastal, urban and industrial areas including those around the steelworks and docks. The River Afan falls within this SINC site.

Other designations

B-Lines

3.1.9 The steelworks and associated docks form part of a regional ‘B-Line’ network which is a national initiative led by Buglife for pollinators and wider biodiversity. The B-Lines in Neath Port Talbot and in and around Swansea have been identified by Buglife Cymru working in partnership with local organisations including both planning authorities. Around Port Talbot the B-Lines cover coastal, urban, and industrial land and form wide network of corridors with the objective of facilitating projects that restore, enhance and create wildflower-rich habitat for pollinators as stepping stones along the corridors.

Ancient woodland

3.1.10 The closest area of ancient woodland to the site is a small block on the south-western side of the M4 motorway located 825m from TCA1 and 1.2km from the PDZ . Additional blocks of semi-natural ancient woodland and Plantations of Ancient Woodland Sites are located beyond 1.75km from the Site.

3.2 Habitats

Willow Scrub

3.2.1 Regenerating willow scrub was the most extensive habitat type within the PDZ being c3.8ha in extent and making up approximately 30% of the total vegetation cover.

3.2.2 The shrub willows were all multi-stemmed and form a continuous 6-10m high canopy across the habitat. Other shrub species occur rarely, most notably silver birch *Betula pendula* and goat willow *Salix caprea*. The non-native invasive butterfly bush *Buddleia davidii* has also established on the edges of the scrub.

3.2.3 The ground flora was generally species-poor with large areas of sparsely vegetated ground. Dewberry *Rubus caesius* is abundant in some parts locally becoming dominant while bramble *Rubus fruticosus* is more localised. Other woodland ground flora species occur at low frequency (Yorkshire fog *Holcus lanatus*, creeping bent *Agrostis stolonifera*, rough meadow-grass *Poa trivialis*, false oat grass *Arrhenatherum elatius*, hairy sedge *Carex hirta*, spiked sedge *Carex spicata*, sand sedge *Carex arenaria,* common reed *Phragmites australis*, male fern *Dryopteris filix-mas*, and herb Robert *Geranium robertianum*).

3.2.4 The scrub habitat was less than 20 years old comprising even-aged self-sown species dominated by a single species. Both structural and species diversity is limited reflecting the recent origin of the habitat that has established on previously disturbed ground.

3.2.5 The willow shrubs and ground flora comprises common and widespread species limiting the current value. The presence of JKW around the edges and within the scrub habitats limits the current and future value of the habitat.

3.2.6 The willow scrub habitat contributes to the biodiversity value of the application site and occurs in less extensive blocks in the wider docks. Due to the extent of Japanese knotweed within the scrub habitats it has been classified as having importance for biodiversity in the context of the **site.**

Other Scrub

3.2.7 Areas of mixed species scrub and bramble scattered in the PDZ primarily associated with the margins of the regenerating grey willow with gorse dominated areas on the eastern side where the substrate is drier. The habitat extents are relatively small (bramble 0.45ha, gorse and mixed species scrub 0.45ha) but contribute to the scrub grassland habitat mosaic along with small stands of bracken.

3.2.8 In TCA1, shrub species are scattered primarily on the margins. Self-sown grey willow and the non-native butterfly bush are the main species with a few small areas of gorse. All are young have not yet coalesced to form blocks of dense scrub. Outside the western boundary a strip of bramble has established, ivy and scattered scrub, have established on the engineered platform running adjoining the wall of the open water dock.

3.2.9 Habitats at Crown Wharf adjoining the site of the Marine Loading/Unloading Facility are a 1.5m high bramble thicket with grades into dense bracken at the western end. A small group of semi-mature multi-stemmed sycamore trees *Acer pseudoplatanus* trees grow on the edge of the dock wall and a number of individual butterfly bush shrubs have colonised.

3.2.10 Overall the mixed species and gorse scrub habitats contribute to the biodiversity value of the application site. The bramble scrub forming thickets is a widespread low value habitat. Japanese knotweed is growing amongst these scrub habitats in the PDZ and having limited extent have been classified as having importance for biodiversity in the geographic context of the **site.**

Invasive Non-Native Plant Species

Japanese Knotweed

3.2.11 Extensive stands of long-established Japanese knotweed cover approximately 40% of the PDZ with the largest expanses located in the south-western part. In many locations the stands were growing within willow scrub.

3.2.12 Areas with dense old growth of Japanese knotweed are widely distributed. Young shoots were noted around the edges of many of the stands and some individual young plants were noted growing in the willow scrub and grassland a significant distance from older growth.

3.2.13 This species is a significant negative factor adversely affecting the current biodiversity value of the PDZ. It is increasing in extent over time with the associated loss of grassland and bramble scrub. If left unmanaged, Japanese knotweed would result in the loss of all but the willow scrub.

3.2.14 Japanese knotweed stands make up over 2.25ha of the 9ha PDZ with multiple small stands and young shoots present in other habitats. This habitat has **negligible** importance for biodiversity value and reduces the value of all the habitats in which it establishes.

Other Species

3.2.15 Montbretia *Crocosmia x crocosmiiflora* is very locally abundant in several locations in the centre of the PDZ. Wall cotoneaster *Cotoneaster horizontalis* has established in a few locations in the PDZ and forms a locally dominant cover adjoining the western boundary of the TCA.

3.2.16 Sea buckthorn *Hippophae rhamnoide*s has colonised the boundaries of the PDZ in two locations where it will have spread into the site by seed from established stands in the wider docks. Butterfly bush is scattered within the PDZ and TCA. These species have **negligible** importance for biodiversity value and reduce the biodiversity value of habitats in which they occur.

Grassland

Coastal Grassland and Dune Slack Vegetation

3.2.17 These two habitat types are very small in extent located in the central part of the PDZ. The coastal grassland is c0.05ha and is growing on a very sandy substrate. The grassland has an open structure with coarse grasses only present at low frequency. Dewberry is abundant with the associate species of hairy sedge, Yorkshire fog, common restharrow *Ononis repen*s, creeping willow *Salix repens,* and ribwort plantain *Plantago lanceolata*. Japanese knotweed is encroaching into this habitat on all sides.

3.2.18 It is characterised by a high percentage cover of herbs and sedges with minimal bare ground. The overall species assemblage is moderately diverse with some variation. Locally frequent species include bird's-foot trefoil *Lotus corniculatus*, thyme-leaved sandwort *Arenaria serpyllifolia*, red fescue *Festuca rubra*, sand sedge, common restharrow, *Ononis repens*, and common storks-bill *Erodium cicutarium*.

3.2.19 The dune slack vegetation has established on seasonally flooded ground on the margin of the central hardstanding in an area less than 10m x 10m. The species composition is characterised by creeping willow, water mint *Mentha aquatica*, dotted sedge *Carex punctata* and glaucous sedge, sharp rush *Juncus acutus* and sea rush *Juncus maritimus*.

3.2.20 Other species occurring at low frequency included creeping bent, dewberry, eyebright species *Euphrasia* sp., bird's-foot trefoil, and selfheal *Prunella vulgaris*. Young willow and birch are colonising the habitat which is currently partially shaded. Over time, the shrubs will become the dominant cover with the reduction and ultimate loss of the specialist dune plants.

3.2.21 These two areas are located about 30m apart and divided by woodland. This assemblage of species in both areas is typically of dune grassland and slacks and are equivalent to semi-natural dune habitats that classify as Section 7 Habitats. Although small in extent the coastal grassland supported populations of 22 SINC indicators species as well as additional species that are locally uncommon. Together the habitats have importance for biodiversity in a **local** geographic context.

Naturally Regenerated Grassland

3.2.22 The multiple areas of naturally regenerated grassland habitat in the PDZ together reach 1.25ha in extent. The largest area lies in the eastern section of site forming linear strips between scrub habitats and on the north-western boundary adjoining the Phoenix Way.

3.2.23 Further smaller areas of grassland are present as 'glades' between regenerating willow, Japanese knotweed and bramble in the western half of the site and at the base of the railway embankment on the southern boundary.

3.2.24 Across the PDZ the different areas of grassland show variation in the structure and species diversity. All the open structured grassland has a broadly similar composition with dewberry and hairy sedge both generally abundant.

Eastern Area

3.2.25 Eastern area of grassland a patchy sward height and areas of more sparsely vegetated ground. A wide range of herb species are widespread but only occur at lower frequency. These include the indicators St Johns wort, yarrow, agrimony *Agrimonia eupatoria*, evening primrose, meadow vetchling, heath bedstraw *Galium saxatile*, wild strawberry *Fragaria vesca,* and common knapweed *Centaurea nigra*.

3.2.26 In the north-eastern corner of the PDZ the substrate is drier ground with patches of bare ground. Additional indicator plants included red bartsia *Odontites vernus*, yellow-wort *Blackstonia perfoliata*, common broomrape *Orobanche minor,* fern grass *Catapodium rigidum*, sheep's sorrel *Rumex acetosella*, eyebright *Euphrasia* sp, vervain *Verbena officinalis*, and common centaury *Centaurium erythraea*. Hawkweed oxtongue *Picris hieracioides* is occasional and a small number of spikes of oxtongue broomrape *Orobanche picridis* (Schedule 8) was recorded in late June 2022.

3.2.27 Several negative indicator ruderal species were present at low frequency: spear thistle *Cirsium vulgare*, creeping thistle *Cirsium arvense*, white clover *Trifolium repens*, ragwort *Jacobaea vulgaris*, and hogweed *Heracleum sphondylium*. Willow and butterfly bush saplings are also colonising the grassland.

North-western Area

3.2.28 The grassland in the north-western boundary of the PDZ, adjoining the internal port road has a more patchy composition with a mix of open and closed grassland. Open areas have a similar composition to the glade grasslands with dewberry and hairy sedge both frequent and in places forming the dominant cover on a sandy substrate. Patches of closed grassland are characterised by coarse grasses (hybrid sea couch and false oat-grass *Arrhenatherum elatus*).

3.2.29 As a whole, the north-western grassland supports a moderately diverse sward assemblage with most of further species only occurring occasionally or rarely. Pyramidal orchid *Anacamptis pyramidalis* was locally frequent in both the open and closed grasslands.

Central and Southern 'Glades'

3.2.30 The glade areas were characterised by a patchy long grass and dewberry sprawling through the sward creating a relatively closed grassland structure. Yorkshire fog and creeping bent were the Several common grass species were abundant grass. Locally frequent herbs included creeping cinquefoil *Potentilla reptans,* greater bird's-foot trefoil *Lotus pedunculatus* and hedge bedstraw *Galium mollugo*.

3.2.31 The more diverse areas of glade grassland areas supported populations of yarrow *Achillea millefolium*, creeping willow, evening primrose *Oenothera* sp, wild parsnip *Pastinacea sat*iva, common vetch *Vicia sativa*, and greater knapweed *Centaurea scabiosa*. The species composition indicates that the substrates become seasonally waterlogged with common figwort *Scrophularia nodosa*, meadow vetchling and square stemmed St john's wort *Hypericum tetrapterum* southern marsh orchid *Dactylorhiza praetermissa*, hard rush *Juncus inflexus,* and common fleabane *Pulicaria dysentric*a also recorded.

Overall

3.2.32 Overall the generally open grassland areas supported populations of over 44 SINC indicator species of grassland or post-industrial habitats (where over 20 indicator plant species is equivalent to county status). The grasslands have variable diversity with a few abundant species (hairy sedge and dewberry) present throughout.

3.2.33 Japanese knotweed has established on the margins and in many areas is encroaching into the grassland areas reducing their current and future biodiversity value. Consequently the naturally regenerating grassland habitats as a whole have importance for biodiversity in a **local/district** geographic context

Seasonally Flooded Ground

3.2.34 Three seasonally flooded areas in the PDZ support open stands of common reed bounded by regenerating shrub willows and patches of Japanese knotweed. Combined they are 0.18ha in extent.

3.2.35 Each area holds water throughout winter but rapidly dry out in spring. Dense stands of seasonally dry reedbed occupying c0.09ha. Where reed growth is less dense, a small number of bryophyte species create a dense carpet below the common reed. Other aquatic plants include sea club rush *Bolboschoenus maritimus* and slender spike rush *Eleocharis uniglumis*, both indicators of brackish water. Other wetland plants present at low frequency are common spike-rush *Eleocharis palustris*, reedmace *Typha latifolia*, jointed rush *Juncus articulatus*, and water plantain *Alisma plantago-aquatica*.

3.2.36 These seasonally flooded areas are small in extent does not classify as Section 7 habitat as they hold water for less than half a year. They considered to have biodiversity importance in context of the **site**.

Bare ground / Ephemeral Vegetation

3.2.37 An area of recolonising bare ground / hardstanding lies in the centre of PDZ (0.53ha) with a smaller areas adjoining the northern boundary and in the eastern section of the site (0.2ha)

3.2.38 Much of the main area is flooded in winter and very dry in summer. A thin layer of accumulated silt on top of the hardstanding which remains largely unvegetated with scattered plants of water mint *Mentha aquatica*, silverweed *Potentilla anserina*, hard rush *Juncus inflexus* and yellow-wort *Blackstonia perfoliata* primarily around the margins where the recolonising shrub willows are also recolonising.

3.2.39 The small northern area of recolonising concrete hardstanding supports ephemeral vegetation and some bryophytes. Colonising species include perforate St john's wort *Hypericum perforatum*, bird's-foot trefoil, eyebright *Euphrasia* species, hard rush, common reed, southern marsh orchid, creeping willow, creeping cinquefoil and hairy sedge.

3.2.40 The main area is sparsely vegetated and does not form a habitat mosaic, In contrast the northern area has characteristics of Open Mosaic Habitat (OMH) but less than 0.25ha in extent. Consequently neither meets the criteria for classification as this Section 7 Habitat which is associated with previously developed ground. These habitats have importance in the geographic context of the **site**.

Open Mosaic Habitat

3.2.41 Within the planning application boundary, the open mosaic habitat is located within TCA1, an area of land that was recently operational and bare ground created when operations ceased and structures were removed is gradually recolonising. The substrate is a flat expanse of unsealed made ground consisting of mix of materials including crushed concrete and waste steel slag with very localised areas of unvegetated solid bare concrete and sealed tarmac.

3.2.42 There is negligible soil cover and much of the area supports bare ground / sparse ephemeral vegetation, with areas of mixed ephemeral vegetation. Scattered scrub has colonised in patches and an open grassland is forming around these areas.

3.2.43 A good assemblage of early successional plant species have colonised and spread with the nutrient-poor nature of the substrate virtual absence of soil creating conditions suitable for non-ruderal pioneer vegetation with many species adapted to dry grassland conditions where the growth of more competitive plants is severely limited.

3.2.44 TCA1 primarily comprises a habitat mosaic of sparse ephemeral vegetation, mixed species ephemeral vegetation, open structured grassland, and bare ground. The percentage cover of herbs, grasses and bryophytes varies across the habitat influenced by variation in the underlying substrate.

3.2.45 In total 39 SINC indicator species of grassland and post-industrial habitats were recorded in the open mosaic habitat in TCA1, most abundantly kidney vetch, bird's-foot trefoil, black medick *Medicago lupilina*, and hawkweed oxtongue. Eyebright compact brome *Bromus madritensis*, fern grass. and fescues *Vulpia* spp were locally frequent. A few grasses are widely distributed but generally only form a sparse cover with creeping bent and Yorkshire fog the main colonising species.

3.2.46 A wide range of herb species occur at low frequency including many indicators of neutral grassland. calcareous grassland and open mosaic habitat including wild carrot *Daucus carota*, yellow-wort, common centaury *Centaurium erythraea*, hare's-foot clover *Trifolium arvense*, and hop trefoil *Trifolium campestre*. Additional indicators occurring rarely were quaking grass *Briza media*, bee orchid *Ophrys apifera*, flattened meadow-grass *Poa compressa*, tansy *Tanacetum vulgar*e and sheep's fescue *Festuca ovina* were all rare or present as localised populations.

3.2.47 The open mosaic habitat that has developed on recently disturbed ground has importance for biodiversity in **local/district** geographic context primarily due to the botanical diversity.

Oxtongue Broomrape

3.2.48 Colonies of oxtongue broomrape, a nationally rare plant legally protected under Schedule 8 of the WCA. It is a parasite of hawkweed oxtongue and requires good populations of the hosts species to sustain colonies.

3.2.49 The plant occurs at variable density within the open mosaic habitat in TCA1 with the highest density of spikes at the northern end of TCA1 and in the eastern section of Margam Wharf outside

but adjoining the application site. Fewer broomrape plants were present in the very sparsely vegetated ground in the centre and areas of scattered scrub. Only two spikes of oxtongue broomrape were also recorded in grassland in the north-eastern part of the PDZ in 2022.

3.2.50 Oxtongue broomrape also occurs in a number of locations in the wider docks with colonies in the wider Harbourside site (Areas A, B and C West) and in the grassland adjoining the harbour foreshore, all outside the planning application boundary. The LPA ecologist has highlighted recent records of further colonies in the wider area outside the dock; but it is nationally rare plant with only a small number of colonies in other locations in the UK.

3.2.51 The proportion of the local population of oxtongue broomrape occurring in TCA1 has at least **local** importance in context of docks. This area forms part of the Port Talbot population which is important in a **nationa**l context.

Lower Plants

3.2.52 A total of 44 species were recorded in the PDZ and TCA1 almost entirely limited to the areas of sparsely vegetated ground and open structed grassland on sandy substrates.

3.2.53 The ruderal communities of bryophytes growing on sparsely vegetated ground in the centre the most diverse comprising common species such as *Didymodon fallax*, *Cratoneuron filicinum*, *Homalothecium lutescens*, *Schistidium crassipilum*, *Streblotrichum convolutum* and *Syntrichia ruralis*.

3.2.54 The coastal grassland supported a narrow range of common species, such as *Homalothecium lutescens* and *Syntrichia ruralis* and *Calliergonella cuspidata* which was locally abundant. The flat topography and lack of variation in ground condition limited the diversity of mosses in this habitat.

3.2.55 The sparsely vegetated in the TCA were moderately diverse with a total of 36 species. The open structed grasslands has lower diversity with a few abundant species including *Calliergonella cuspidata* and *Homalothecium lutescens*.

3.2.56 The epiphyte flora in the PDZ is particularly poor, with the notable absence of common epiphytes growing on the regenerating shrubs willows possibly influenced by the levels of airborne dust.

3.2.57 No bryophytes of species of conservation interest or assemblages of conservation interest are present within the application site. Epiphytes within the scrub were very poorly developed and almost all trees were completely devoid of bryophytes.

3.2.58 Effects on bryophytes are assessed as part of the impacts and effects on the relevant habitats in which they occur and are considered separately in the EcIA.

3.3 Faunal Species

Bats

3.3.1 There are no potential roost features within the PDZ, TCA1 and TCA West. All the shrub willows were multi-stemmed and had narrow diameter trunks and there are no more large semi-mature or mature broadleaf trees will be affected. Daytime inspections confirmed the absence of any potential roost features in the line of cypress trees and the open-sided metal carport, on the eastern of the PDZ.

3.3.2 Assessment of buildings in TCA East are ongoing, with the initial Preliminary Bat Roost Assessment concluding that four buildings have low roost potential. These are being subject to emergence surveys to further assess the presence/absence of roosts.

3.3.3 In relation to activity, four bat species were recorded within the planning application site during the transect surveys and/or remote recording: common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle and noctule.

Common pipistrelle

PDZ

3.3.4 Common pipistrelle was by far the most frequently encountered species with extended foraging by a small number of bats in the north-eastern and eastern parts of the PDZ, where open grassland adjoins willow scrub, gorse and bramble and where there is shelter alongside the line of cypress trees.

3.3.5 In this part of the PDZ, remote detectors recorded an average of 185 common pipistrelle passes recorded per night in mid-summer. Observations from transects also confirmed that bats feed on insects around streetlights on the northern boundary of the PDZ. The scrub habitat on the southern boundary of the PDZ (adjoining the off-site embankment down from the railway sidings) and on the north-western boundary were also shown to be used as bat flight lines. Lower levels of common pipistrelle activity were recorded in other parts of the PDZ, typically limited to occasional commuting passes.

Crown Wharf and TCA

3.3.6 Occasional common pipistrelle activity was also recorded at the proposed Marine Loading/Unloading Facility primarily associated with the small group of young multi-stemmed sycamore trees. In TCA1 the number of passes per night was less than 10 on all but one night when 63 passes were recorded. This increased level of activity is very likely to relate to a brief period of higher numbers of airborne invertebrates.

Overall

3.3.7 The site is associated with very low levels of activity but includes localised areas that are regularly associated with low to moderate levels of activity. Common pipistrelle is a commonly occurring species and the local population will utilise many different foraging habitats and commuting routes. Overall the site is classified as having up to **local** value as a resource for the local population of this species.

Other Bat Species

3.3.8 The three other bat species were typically recorded at very low levels across the Site. The peaks of activity recorded on the Crown Wharf dockside in late summer, with an average of 24 passes per night for soprano pipistrelle activity and an average of 3 passes per night for noctule activity. Although higher than normal these still represent low levels of activity.

3.3.9 A single Nathusius' pipistrelle pass was detected; recorded on a remote detector on the western perimeter of the PDZ confirming use of the boundary of the PDZ as a commuting route. For these three bat species the habitats within the application site are classified as being as a resource of importance in up to a **site** context.

Otter

3.3.10 Past records of otter from the River Afan confirm the presence of a local population. Otters typically hold large territories, and it is assumed that the intertidal section of the river to the north-west of Port Talbot Docks will be part of an active territory. Fish species will be present and may be abundant in the open water dock and as a potential prey species it is assumed that otters will at least occasionally use the open water dock habitats when hunting, typically at night.

3.3.11 During the daytime, otters use holts and dense cover in undisturbed locations to lay up. The open stands of common reedbed growing through a carpet of bryophytes are flooded in winter and lack dense cover when an otter would remain hidden. Prey species favoured by otter will also be absent. Willow scrub adjoining the reed has a sparse vegetation with no cover at ground level due to the seasonal flooding. Potential cover limited to the localised areas of bramble scrub on slightly higher ground.

3.3.12 The strip of terrestrial habitats alongsideCrown Wharf berth lie very close to the Phoenix Way and will be subject to high levels of indirect disturbance. The very open short vegetation with scattered scrub in TCA1 provide negligible cover. Both areas were considered unsuitable to be used as resting places.

3.3.13 Surveys found no evidence of any otter activity or potential laying up places in the PDZ or the TCA1.

3.3.14 The naturally regenerated habitats in the PDZ and TCA1 have negligible value as places of shelter for otter.

3.3.15 Under the precautionary principle it is assumed that wider open water dock is part of a foraging territory and is classified as potentially having importance for otter in a local **context**.

Badger

3.3.16 No signs of badger were recorded within the site. The potential value of the habitat for the establishment of setts and as foraging habitat is sub-optimal because of the post-industrial nature of the site. The site has negligible importance for badger and are not considered further in the EcIA.

Breeding Birds

3.3.17 A precautionary assessment of the breeding bird assemblage using the PDZ has been made based on the types of habitat and observations of activity in these features in the wider docks.

3.3.18 The breeding bird survey in the wider docks in 2021 covered the 23ha area of land to the west of the PDZ with the survey area subdivided into Areas A, B, C West and C East. A total of 31 species were recorded in these habitats or hunting over the survey area, of which 24 were classified as breeding within the Harbourside site. A further six species recorded as foraging were classified as nesting in nearby habitats.

3.3.19 The regenerating willow scrub and grassland habitats in Area C East are very similar in structure and composition to these habitat types in the PDZ with the willow scrub habitat overlapping the boundary. In total 11 species were recorded as breeding in Area C East, with each of these species nesting in scrub habitats.

3.3.20 Overall, it is estimated that at least 12 species and up to 20 species have bred in the PDZ with the estimated numbers of nesting pairs higher than in Area C East due to the greater extent of scrub.

3.3.21 The assemblage includes all the species that were breeding in Area C East in 2021 and additional species based on the habitats and observations and records from the wider Harbourside site.

Breeding Bird Assemblage

3.3.22 The majority of nesting habitat within the Site is associated with the denser structured vegetation, principally bramble, gorse and woody hawthorn scrub which have a scattered distribution across the PDZ. The dense bracken also provides potential cover for species associated with scrub that nest on the ground.

3.3.23 Low levels of activity were recorded in the regenerating willow scrub in Area C East and was consistent with observations in the PDZ in 2022. The open growth structure and narrow diameter branches and generally sparse ground cover provides few nesting opportunities. The areas of open structured grassland enclosed by scrub and Japanese knotweed have negligible value for species of ground nesting birds such a skylark and meadow pipit.

3.3.24 Nine of the 20 species meet at least one of a range of criterion relating to nature conservation including Species of Principal Importance (Section 7, Environment Wales 2016), Birds of Conservation Concern in Wales (BoCCW) Red or Amber lists, or species protected under Schedule 1 of the Wildlife and Countryside Act 1981.

BoCCW Red List species

3.3.25 Goldcrest *Regulus regulus* (1 pair) - Goldcrest has been confirmed as breeding in the line of cypress conifers on the eastern boundary.

3.3.26 Linnet *Linaria cannabina* is common resident breeding species in the county. and linnet is a potentially breeding species in gorse and bramble with an estimate of up to 2 pairs.

3.3.27 Whitethroat *Sylvia communis* is a confirmed breeding species in the PDZ and is a common breeding passage migrant with an estimate of up to 3 pairs.

BoCCW Amber List species

3.3.28 Bullfinch *Pyrrhula pyrrhula*, dunnock *Prunella modularis*, chaffinch *Fringilla coelebs*, and magpie *Pica pica*, are all common resident breeding species in the county.

3.3.29 Song thrush *Turdus philomelos* is a Section 7 species but was reclassified as BoCC green (low conservation concern) in 2022.

Schedule 1 Species

3.3.30 Cetti's warbler *Cettia cetti (*Schedule 1) is regional status locally common resident with PDZ having the potential to support a single pair.

3.3.31 A few bird species nest on the margins of the wider open water dock as whole. The engineered sides to the dock at Crown Wharf and adjoining the TCA1 provide little cover and no breeding bird activity was recorded in these locations.

3.3.32 Species that are assumed to be nesting in reed and scrub habitats around the open water dock include the passerines reed warbler, sedge warbler (both BoCCW Green List), reed bunting (BoCCW Red List) and Cetti's warbler (Schedule 1, BoCCW Green List). Wetland species nesting in the dock area include mute swan, Canada goose, mallard, and moorhen (all BoCWC Green List). Herring gull and lesser black backed gull (both BoCCW Red List) nest on the roofs of nearby industrial buildings.

3.3.33 The breeding bird assemblage within the application site is classified as having **local** importance.

Wintering Bird Assemblage

3.3.34 A total of 16 species of conservation interest were recorded during monthly counts of the open water dock undertaken between October and March 2023 and during surveys of the PDZ undertaken between October and March 2021.

3.3.35 The species composition recorded in 2022/ 2023 closely matched the monthly counts completed over five years at the time when Wetland Bird Survey (WeBS) surveys were being undertaken.

3.3.36 The assemblage of wetland birds regularly using the dock is small comprising species that are common and widespread in coastal/wetland habitats during winter months. All the species occur in small numbers, with the exception of the gull species.

3.3.37 The peak counts in the open water dock during the (WeBS) between 2012-2016 were notably higher than the peak counts in winter 2022/2023. During the WeBS counts only four wader species were recorded: lapwing (BoCCW Red List), oystercatcher, snipe and common sandpiper (BoCCW Amber List). All were infrequent visitors and recorded in small numbers with the exception of snipe, a species which will be present in habitats on the in the immediate vicinity of the dock each winter. Small numbers of snipe were recorded in the PDZ and nearby off-site land, associated with seasonally flooding. Woodcock (BoCCW Red List) was also occasionally recorded in the PDZ.

3.3.38 The willow and other scrub habitats are used by a range of passerine species over winter feeding on seeds and invertebrates. The BoCCW species recorded were mistle thrush, grey wagtail, magpie, snipe and woodcock.

3.3.39 Passerine species also occasionally feed on berries in the TCA1, especially during early winter with abundant fruit on the invasive non-native species wall cotoneaster. BoCC red or amber list species were limited to individual meadow pipit, mistle thrush and magpie. The PDZ, TCA1 and open water dock (partly located within the application site) have **local** importance for wintering bird populations.

3.3.40 Outside the application site, the rocky habitats and intertidal mud and sand on the sides of the tidal section of the River Afan are used by gull flocks and some number of overwintering wader species during low tides. The rocky intertidal areas on the margins of the river channel are also foraging habitat for small numbers of waders. The small assemblage of wetland species associated with the dock and low tide intertidal habitats of the River Afan has importance in the context of the **local** area.

Reptiles

3.3.41 Reptile surveys in 2022 confirmed the presence of populations of three native reptile species, slow worm, grass snake and common lizard, which all occur in the PDZ. Individual grass snakes and common lizard were also present on the edge of the bracken adjoining Crown Wharf. No reptiles were found in the TCA1 indicating likely absence in this location.

Common Lizard

3.3.42 The PDZ supports a good population common lizard with a peak count of 18 adults found in the PDZ. Almost all the juveniles were recorded under refuges in the eastern area of grassland. The common lizard population within the PDZ forms a small part of a much larger population utilising suitable habitats present across many parts of the wider Harbourside site. The common lizard population occurring within the Site has importance in context of **local area.** It forms a part of larger population across Port Talbot Docks of county importance.

Grass snake

3.3.43 Grass snake were confirmed to be breeding in the PDZ and this species also utilise the adjacent habitats alongside the dock at Crown Wharf. Adults were recorded in the PDZ on three occasions, with two observed during one visit. Individual juvenile grass snakes were recorded once in the PDZ and twice at Crown Wharf. Sub-adults were also recorded in the wider area around the PDZ and in the wider Harbourside site.

3.3.44 The areas of seasonally dry reedbed and unmanaged bracken provide conditions suitable for egg laying but would not support amphibian prey species. The population of grass snake resident within the application site have **local** importance.

Slow worm

3.3.45 Very small numbers of slow-worm *Anguis fragilis* were found in grassland and scrub on the margins of the regenerating willow, indicating that the population within the PDZ was small and primarily associated with habitats on the perimeter.

3.3.46 Larger numbers of slow-worm were recorded in Area C East where there are more extensive south-facing scrub edge habitat.

3.3.47 The slow worm population within the application site has importance in the geographic context of **site.** The individuals in the PDZ will form part of a larger population primarily occurring outside the application site. The wider population within the dock will have at least local importance.

Amphibians

Great Crested Newts

3.3.48 No waterbodies with potential to support great crested newts *Triturus cristatus* (GCN) within 250m of the boundary of the application site.

3.3.49 The temporary/seasonal waterbodies located in operational yards within the Tata steelworks have negligible potential value as breeding habitat for GCN.

3.3.50 GCN surveys of waterbodies in wider docks have confirmed the very likely absence of this species from the two areas of permanent open water within the Harbourside site, the reedbed with areas of open water in the base of a former mineral extraction (Area B) and a very small man-made waterbody constructed below the artificial sand martin nesting bank (Area C West).

3.3.51 Based on the survey findings, the habitats in the PDZ and TCA have negligible importance for GCN. and are not considered further in the EcIA.

Invertebrates

PDZ

3.3.52 A range of habitats and micro-habitats offering a wide range of opportunities for invertebrates occur within the wider docks. This includes bare sandy ground, varied topography, open water, reedbed, open mosaic habitat, open structed flower-rich grassland, tussocky grassland and scrub.

3.3.53 These features contribute to the value of the local area for invertebrates. Many invertebrate species have very precise requirements for habitat ‘niches’ and the range of ground conditions increases the diversity of micro-habitats available to invertebrates. The wildflower populations will provide valuable sources of nectar and pollen in the context of the site and its surroundings.

3.3.54 The terrestrial invertebrate survey in the Harbourside site in 2021 (covering Areas A – C) recorded a total assemblage of 317 species from sampling in mid and late summer confirmed the presence

of a number of Red Data Book (RBD), nationally scarce and Section 7 species, primarily associated with the grassland, banks, and flower-rich habitats.

3.3.55 The clearance of scrub habitats in the PDZ by ABP (following dialogue with the Council to enable the Japanese knotweed control measures), prevented full invertebrate surveys being undertaken in 2023.

3.3.56 Compared to the highest value parts of the Harbourside site, the PDZ is a relatively flat area lacking the variation in topography and many of features that were associated with invertebrate abundance.

3.3.57 Area C East, immediately adjoining the PDZ to the west has a similar range of scrub and grassland habitats and the invertebrate assemblage in the PDZ should have a large crossover with this area having equivalent habitat structure and composition.

3.3.58 In the 2021 survey, a total of 157 invertebrate species were recorded in Area C East over the three survey visits, which was classified as a surprisingly good diversity given the extent of regenerating even-aged scrub dominated by grey willow. The invertebrate diversity was primarily associated with the willow scrub/grassland margins, mixed species scrub including gorse and broom, and open structured grassland as well as a large south-facing sandy bank.

3.3.59 Based on the habitat types and extents and following a precautionary assessment the PDZ is predicted to have a total diversity of between 145 - 155 species. This is a conservative estimate taking into account the extent of Japanese knotweed, absence of bank features and homogeneity of the regenerating grey willows as well as recognising that a proportion of the species assemblage using the PDZ have not been recorded.

3.3.60 In the 2021 the ratio of species with conservation status (Red Data Book, National Scarce, Section 7) varied from 7 to 9% in the different survey compartments. The percentage of the assemblage in the PDZ that classify as key species is expected to be consistent with this.

TCA1

3.3.61 The TCA1 comprises flat ground with open structured grassland, sparse vegetation and localised areas of open flower-rich vegetation growing on previous developed land that has disturbed in the recent past with close similarities to another area of the docks that was included in the survey in 2021 where a total of 85 species were recorded.

3.3.62 Under a precautionary approach the species diversity is expected to be broadly equivalent with differences in the species composition where a total of 85 species were recorded. TCA1 is only 2.1ha and under a precautionary assessment the total species diversity is expected to be less than 60 given its smaller size and the absence of any boundary grassland banks. The percentage of species of conservation concern equated to 9% of the total assemblage in these pioneer habitats and it is assumed it will be comparable in the TCA1.

Overall

3.3.63 Following a precautionary approach, the application site is predicted to have **local** importance for invertebrates due to the varied conditions and micro-climates created by the patchwork of scrub and naturally regenerating grassland.

4 IMPACT ASESSMENT

4.1 Summary of Development Proposals of Relevance to the EcIA

4.1.1 The Proposed Scheme will comprise a new facility for the production of sustainable aviation fuel in the form of Alcohol to Jet Synthetic Paraffinic Kerosene (ATJ SPK) and sustainable diesel.

4.1.2 The proposed development comprises the primary process areas and administrative operational facilities.

4.1.3 As a production facility for Jet Fuel from Ethanol the development must meet the requirements of the Control of Major Accident Hazards (COMAH) Regulations to prevent major accidents involving dangerous substances.

Landscape Scheme

4.1.4 The layout has been designed to minimise potential fire hazards and this has included the design of the landscaped areas within the PDZ. The 12.5kW/m2 thermal radiation level has been modelled around the processing areas defining the zone in which habitat features cannot be integrated into the development.

4.1.5 This has limited to extent of landscaping and vegetation cover which is located towards the boundaries and to maximise value the individual features have been designed to have multifunctional benefits for biodiversity, landscaping and sustainable drainage (SuDS).

4.1.6 The largest landscaped spaces are located within the administration area, between the truck loading area and Phoenix Way and towards the western boundary alongside a proposed internal road. The main proposed habitat is flower-rich grassland and pioneer vegetation which will be established on nutrient-poor substrates, features that should be equivalent to habitats of biodiversity value in the wider dock. The vegetation proposed is associated with industrial sites which can support key foodplants for invertebrates and provide sources of pollen and nectar. Both habitat types are suitable for periodic disturbance, with low maintenance requirements.

4.1.7 Site-won substrates will be used where possible (subject to the results of ground investigations), or alternatively similar inert post-industrial substrates will be sourced from the wider dock or will be imported.

4.1.8 The landscaping features within the PDZ will include:

- Flower-rich grassland/pioneer vegetation
- Modular biodiversity (bespoke gabion) walls
- Biodiverse green/brown roof with solar on the administration building
- Small green/brown roofs on small buildings (Site Entrance 1 and Gatehouse 1)
- Gravel substrate rain gardens (adjoining hard landscaping)
- Insect hotels
- Large rock features

4.1.9 The development will have permeable paving (staff car parking areas), trapezoidal ditches (gravel based swales) along the Phoenix Way and macro-permeable paving (frontage of warehouses).

Enabling and Construction

Site preparation is expected to commence in 2024 (i.e. site enabling works) and require up to 3 years to construct, inclusive of commissioning of the processing plant and overall facility. As such, the Proposed Scheme is expected to be operational by the end of 2026/early 2027.

4.1.10 The existing topography in the PDZ will be partial reprofiled to create a broadly level site at 8m AOD. Remedial measures will be employed to address any identified contamination and unstable or compressible ground.

4.1.11 A temporary drainage strategy will manage surface water runoff volumes and quality during the construction stage. It is anticipated that the temporary drainage strategies for the PDZ and TCA areas will incorporate attenuation features which will remain part of the operational surface water drainage system and take advantage of any post-development attenuation SuDS without compromising the long-term operation of the SuDS features.

4.1.12 The core construction working hours will be from 07:00 to 19:00 across all days with potential for works outside these hours, subject to agreement with NPTCBC. Temporary construction lighting will be required in the working areas across the PDZ and the TCAs. Illumination during construction will be sufficient for safe access and working, during daytime hours and at night. Temporary light poles will be installed around buildings, and in parking area. All common areas, pathway, roads used for construction will be lit by light poles on concrete bases. Lighting locations will be planned and defined on site according to requirements. For prolonged night-time Illumination will be a minimum illumination of 100 Lux. Pedestrian passages, vehicle turning, loading and unloading points will be a minimum of 50 Lux and pedestrian walkways a minimum of 5 Lux.

PDZ Operations

4.1.13 The sustainable aviation fuel production facility will be operational 24 hours a day, 365 days a year and will be artificially lit.

4.1.14 A Lighting Assessment (AECOM, August 2023) sets out the principles of operational lighting design within the PDZ. A lighting strategy has been developed by Technip Energies which provides an overview of the proposed lighting equipment selection. The lighting assessment considers the effects of the proposed development based on a worst-case scenario, i.e. site area, build height and spatial setup during operation, with all lighting which may be utilised during phased requirements switched on. Screening and obstruction by buildings and vegetation outside of the Site boundary was not included in the light level modelling. Vegetation will create variable screening throughout the year.

4.1.15 All areas of the operational site will be artificially lit at night. Indicative modelling provided for the assessment predicts light levels of between 0.5 and 2 Lux on all four boundaries of the site with 1 Lux contours extending up to 5m from the site boundary which quickly falls to 0.5 and 0.1 lux.

4.1.16 The detailed lighting scheme will be prepared at the detailed design stage.

4.1.17 Controls of obtrusive light to maintain suitable limits referenced as potential mitigation measures in the lighting assessment include the following mitigation measures as part of good lighting design practice.

4.1.18 Installation of shields or baffles on the linear Module lighting would minimise / obscure source intensity in affected viewing directions and contribution to sky glow from upward lighting. Careful consideration to luminaire positioning and orientation can avoid direct effect on boundary features.

4.1.19 Building lighting curfew periods into the operation, would allow lighting to be shut off and/or dimmed at times when there are higher magnitude effects on wildlife.

4.1.20 Lighting units on the site boundaries should use Neutral or Lower colour temperature lamps (CCT ≤ 4000K) should be used to protect the potential value of nearby habitats for bats, birds and invertebrates.

4.1.21 Within the PDZ a 'contaminated' drain system will be installed for the management of contaminated water arising from the processing areas and associated bunded areas. Water entering the drainage system will pass through an on-site Effluent Waste Water Treatment Package before discharge.

4.1.22 An enclosed ground flare extends up to 20 metres in height and its use is essential for operational safety purposes during 'start-up' and 'shut-down' stages which would be intermittently required.

Marine Unloading / Loading Facility

4.1.23 A marine unloading / loading facility or wharf will be constructed in the open water dock to the north of the Site with ethanol and SAF to be transported to and from the operational site via ships.

4.1.24 The detailed design of both the temporary construction and separate permanent operational wharf structures for the marine unloading/loading facility at Crown Wharf is not yet fixed.

4.1.25 The following assumptions have been made to inform the assessment, it is anticipated that the operational wharf will comprise a rectangular 'island' berth, connected to the wall at Crown Wharf, which will provide an access road to the berth and docked ships. 'Loading arms' will be located at the facility to pump ethanol and ATJ SPK to/from the docked ship. A pipe and racking system will connect the facility to the PDZ which will be installed either beneath or above the Phoenix Way.

4.1.26 A temporary construction wharf (with associated slipway) is likely to be installed for the purpose of unloading several larger plant/equipment (i.e., storage tanks) and will be removed prior to the start of operations.

4.1.27 It is assumed that there will be periodic ship movements during the construction phase. During operations average it is estimated that there will be approximately eight vessel movements a month, equating to 110 (two-way) additional vessel movement a year.

4.1.28 Unloading of ships will take up to 18hrs and would be undertaken once every 7 to 14 days,

4.1.29 For the purposes of the assessment it is assumed that the final marine loading facility and temporary construction wharf will be artificially lit.

Phoenix Way

4.1.30 The Proposed Scheme also includes approximately 0.28km of Phoenix Way running east-west alongside the open water dock between Crown Wharf and TCA1.

Temporary Construction Areas

4.1.31 Margam Wharf will be used throughout the construction period. The enabling works for the TCA1 are anticipated to begin in September 2024 and the area will remain in use until the completion of construction at the end of 2026.

4.1.32 The TCA1 substrate is primarily inert rock land fill and forms a very compact solid platform for its temporary use. The existing substrate will be covered with a geotextile membrane and gravel/chippings to support our laydown activities.

4.1.33 The existing substrate will be retained in-situ below the temporary surfaces. At the end of the construction period with the removal of gravel/chippings and the geotextile, will re-expose the existing substrate.

4.1.34 Temporary Construction Areas (TCA West and TCA East) are being assessed and will be included in the EcIA to be submitted with the planning application.

4.2 Assessment of Construction Effects

Statutory Designated Sites

International Designations

4.2.1 During the construction phase there are no identified direct or indirect pathways that could affect any statutory designated nature conservation sites.

4.2.2 The assessment considers the three internationally designated sites located within10km of the development as defined in Section 3. The closest internationally designated sites are located greater than 5km from the development.

4.2.3 None of the habitats within the planning application site are 'functionally linked' to the life and reproduction of a qualifying species for which the international sites have been designated or secondary species listed under the citations.

4.2.4 The potential for the development to cause a significant effect on the features and/or conservation objectives of the identified designated sites has been reviewed. Given the level of physical separation there are no potential impact pathways between construction activities and any internationally designated sites. Under a precautionary principle approach it can be concluded with confidence that there would be adverse effects associated with construction that could impact on the interest features of the relevant European sites.

4.2.5 Activities from the Proposals were identified that could impact on site features and conservation objectives by assessing the magnitude of each impact pathway on the features of the designated site. Direct disturbance, discharges, and emissions from the Proposals were considered.

4.2.6 Through the assessment of each impact pathway project activities or features of each site were screened out accordingly if it was identified there would unlikely be a significant effect from the activity or the feature would not be significantly affected. At this step, in line with recent case-law, assessments are made without consideration of mitigation/avoidance measures, noting that no embedded mitigation measures are in place specifically to ensure that impacts to designated sites are avoided.

National Designations

4.2.7 The closest nationally designated sites are Margam Moors SSSI (supporting coastal/floodplain grazing marsh) and Eglwys Nunydd SSSI (large waterbody). Both are located over 3km to the south with the Tata steelworks creates a very high degree of separation between the application site and the SSSIs.

Non-statutory Sites

4.2.8 The Lower River Afan Estuary SINC and the adjoining Little Warren SINC, lie over 690m from the boundary of the PDZ and 580m from TCA West. These sites are primarily designated for the coastal habitats and the presence of sea stock, a nationally rare plant species also listed under Section 7. With no direct linkage between the SINC designated sites and the construction areas, there will be no predicted direct impacts.

4.2.9 Due to the distances between the construction areas and the SINCs, potential indirect effects on species using the SINC would be limited to noise. Effects on relevant faunal species are considered in the species sections of this version of the EcIA. The modelling of noise is presented in the Noise Assessment, July 2023 by Hunter Acoustics). Dust deposition, artificial lighting and increased human activity are too distant to result in any adverse effects.

4.2.10 Construction noise generated by activities in the PDZ and Crown Wharf will not impact on the features for which the SINCs have been designated. The activity of faunal species using habitats in the SINC could be affected by elevated noise associated with construction but are not primary reasons for the site's designation. These potential effects are assessed in the relevant species sections, primarily otter and wintering birds.

4.2.11 The temporary effects during construction will have a negligible magnitude impact on a county value resource and the effect would not be significant in any geographic context.

4.3 Habitats

Permanent Habitat Loss

4.3.1 The development of the PDZ would result in the permanent loss of the following habitat types and extents:

- Willow scrub – 3.88ha
- Japanese knotweed – 2.25ha
- Naturally regenerating grassland – 1.25ha
- Mixed species scrub, gorse and bramble – 0.9ha
- Hardstanding/sparsely vegetated ground – 0.53ha
- Ephemeral vegetation/bare ground – 0.26ha
- Bracken – 0.25ha
- Seasonally flooded ground – 0.18ha
- Coastal grassland – 0.04ha
- Conifer tree line – 0.03ha
- Dune slack vegetation – 0.01ha

4.3.2 Additional small extents of several of these habitats will be lost from the development of the Marine Loading/Unloading Facility; bramble 0.17ha, bracken 0.1ha and naturally regenerating grassland 0.02ha.

4.3.3 Further small areas of scrub (0.7ha) and ephemeral vegetation (0.11ha) occurring alongside the unnamed part road may be lost.

4.3.4 The habitat loss would be a permanent high magnitude impact on the assemblage of habitats. The largest extents of loss relate to regenerating willow scrub (site value) and the stands of Japanese knotweed (negligible value). The effect is classified as significant in the context of **Site** but not in terms of Japanese knotweed (the removal of this invasive species is a positive benefit of the development and wider regeneration of the port).

4.3.5 The losses of mixed species scrub, bramble, bracken, ephemeral vegetation including bryophytes and the seasonally flooded ground are relatively small in extent and their permanent loss from the PDZ has significance in the context of the **Site** and immediate surrounds.

4.3.6 For the higher value habitats coastal grassland and dune slack vegetation (Section 7 habitat) and the naturally regenerating grassland (equivalent to county importance due the number of SINC indicator plant species) the high magnitude effect of their permanent loss will have significance in a **Local** context.

4.3.7 The removal of Japanese knotweed and other Schedule 9 invasive species will have a beneficial effect of significance in the context of the **Site**.

4.3.8 The use of part of Margam Wharf as TCA1 will result in the temporary loss of c2ha open mosaic habitat (OMH), over 80% of the total extent of this Section 7 habitat at Margam Wharf.

4.3.9 All habitats within the TCA1 will be lost at the outset of its use for construction.

4.3.10 The existing species composition of the OMH is a mix of annuals and perennials with locally abundant mosses. There will be no plant growth, flowering or seeding over the period when the land is in use as the TCA1. However, the seeds of most annual/biennial and all perennial species will remain viable for several years in the retained substrates below the temporary surfacing.

4.3.11 The removal of the asphalt and gravel as part of the decommissioning of the TCA1, will expose the buried post-industrial substrate. If left undisturbed for several growing seasons the germination and recolonisation of pioneer species would at least partially reverse the effects resulting from its use during construction. Subsequent use of the area for port activities would result the effects of use for TCA1 being permanent.

4.3.12 This loss of OMH would be a medium magnitude, likely permanent impact effecting a Section 7 habitat and is classified as having significance in a **Local/District** context.

Oxtongue Broomrape

4.3.13 The Margam Wharf population of oxtongue broomrape is one of many colonies present across the docks and wider area. The number / density of spikes in Margam Wharf in 2022 represented a large population, although there is typically considerable variation between years.

4.3.14 Over two growing seasons the majority of the oxtongue broomrape seed bank will survive in the substrate beneath the working area with most remaining viable for over 10 years.

4.3.15 A small proportion of the oxtongue broomrape seedbank in TCA1 is expected to be depleted over the duration of the construction period because the seed attached to the roots of the host plant (hawkweed oxtongue) will perish.

4.3.16 Oxtongue broomrape is a species adapted to dry sparsely vegetated ground with populations of the host species. The re-exposed of the existing substrate will create conditions which the population could re-establish but only if left undisturbed for several years.

4.3.17 The eastern section of Margam Wharf is located outside the application site and which is owned by Tata Steel. The retained population of oxtongue broomrape and the host plant hawkweed oxtongue should aid the rate of relocation once the TCA1 following decommissioning of the construction areas if left undisturbed for an open mosaic habitat to naturally regenerate and recolonise.

4.3.18 The loss of a proportion of the population of this Schedule 8 legally protected plant over a minimum period of 3 years period would be an impact of medium magnitude. With the Margam Wharf population only part of the total population present across the docks and wider area. The effect is classified as having significance in a **Local** context.

4.4 Invasive Species (Schedule 9)

Japanese knotweed

4.4.1 During construction, ground levelling will result in substrate with rhizomes being moved within the site. In the absence of robust biosecurity measures there is a very high risk of plant material being spread during construction activities. On site bio-secure working practice will mitigate this risk will be detailed in the EMP.

Other Schedule 9 Species

4.4.2 The other two plant species listed under Schedule 9 species that occur in the PDZ (Montbretia and wall cotoneaster) have very localised distributions compared to the Japanese knotweed and there is a much lower risk of spread outside the site.

4.4.3 Plant materials will be disturbed during ground levelling with the potential for plant materials to more widely dispersed if appropriate measures are not incorporated into working practices and environmental protection measures ahead of earth movements.

Sea Buckthorn

4.4.4 Although sea buckthorn is not listed in Schedule 9 in Wales or England, it is non-native in South Wales and is an invasive species in the docks where it has colonised grassland habitats. All the established plants are spreading into the surrounding habitats and in few places form extensive stands.

4.4.5 Following good environmental practice enabling works and construction activities should be designed to avoid the spread sea buckthorn plant or root material capable of establishing new plants. Consequently, the sea buckthorn scrub and the root systems should be excavated and either buried on-site (in an approved location, at least 2m below ground level), or removed from site as detailed in the EMP.

4.5 Species

Bats

4.5.1 There are no construction effects on roosting bats in the PDZ, marine loading/unloading facility, or TCA1. The potential for demolition in TCA East to effect roosting bats is being assessed and will be reported in an updated EcIA.

4.5.2 The permanent loss of all habitats within the PDZ and there will be a partial loss of habitats adjoining the Crown Wharf berth and at Margam Wharf (TCA1).

4.5.3 Consequently the development will result in the permanent loss of localised habitat areas that are regularly used by foraging common pipistrelle, and more occasionally used by soprano pipistrelle and noctule bats.

4.5.4 The overall level of activity is generally low with localised areas of more regular foraging. For example the streetlights on the Phoenix Way adjoining to scrub and grassland and the line of conifers were both locations where common pipistrelle was more frequently recorded. In comparison, the continuous scrub and extensive stands of Japanese knotweed in the PDZ were associated with very low levels of bat activity.

4.5.5 Nathusius pipistrelle was the only other bat species recorded with a single pass on a remote recorder.

4.5.6 The PDZ is located within a green corridor connected to a large 1ha reedbed to the east and further scrub and grassland to the west. The loss of linear strip of scrub on the southern boundary of the PDZ, adjoining the railway sidings, will fragment a bat flight line.

4.5.7 A linear plantation woodland and grassland bank to south of sidings is also an east-west flight line and this feature will maintain a degree of connectivity in the immediate surroundings of the development. The bat species recorded in the application site have high sensitivity to light and are able to cross more open ground when moving through the landscape.

4.5.8 Common pipistrelle, soprano pipistrelle and noctule bats will be relatively common and widespread in habitats in the surrounding area but are also Section 7 species.

4.5.9 The use of lighting during construction will have the potential to periodically reduce activity around scrub habitats adjoining the development area. Lighting used for periods of construction activity outside of the core hours will requiring artificial lighting when bats will be actively foraging and commuting. Artificial lighting is already a factor in the existing site and the small number of bat species foraging in the site do not have sensitivity to lighting. During periods of night time working there will be increased light spill in the PDZ, Crown Wharf and TCA1 potentially affecting the activity of a small number of species.

4.5.10 With very low levels of activity associated with Crown Wharf and TCA1 the removal of habitats will have only a very minor effect on behaviour.

4.5.11 The magnitude of the effect on common pipistrelle is medium in the context of the wider docks with direct and indirect affects locally affecting flightlines, and resulting in a small reduction in the total extent of foraging habitat available to the local bat populations. The effect is predicted to have significance in the context of the **site** and immediate surrounds.

4.5.12 The other three species were detected at very low levels throughout the extended periods of recording and the magnitude of the effect will be minor and has **negligible** significance.

European Otter

4.5.13 There will be increases in noise (including piling), artificial lighting, and human activity during construction period.

4.5.14 Direct effects on perimeter of the open water dock will be limited to a short section at Crown Wharf, while the works associated with Phoenix Way. The same is true of the wharf construction (subject to separate Marine Licence) The construction of the Proposed Scheme does not create any physical barriers to the movement of otters through the open water dock or River Afan.

4.5.15 There was no evidence of otters using habitats in the PDZ all of which had low potential value with no features in which a holt could be established or cover where individuals could rest in dense cover during the daytime. There is no further assessment of direct impacts on otters as a result.

4.5.16 Indirect effects on otters laying up in the wider dock during the day or foraging at night could arise from artificial lighting, noise, and human activity associated with construction. Terrestrial cover around the perimeter of the wider open water dock is provided by localised areas of scrub of low suitability for otter. The areas of reedbed on the margin of the dock will be permanently waterlogged and unsuitable for use during the day.

4.5.17 Therefore potential effects are limited to indirect disturbance of individuals hunting (primarily at night) at the eastern section of the open water dock. Noise generating activities carried out outside of the core daytime working periods would be more likely to influence otter activity if present in the open water dock. Any otters with territories extending into the open water dock will be habituated to industrial activity and the species is known to be tolerant of noise. Behavioural changes at times during construction are possible but these would not impact on the status of the local otter population.

4.5.18 Construction activities would be expected to periodically result in a low magnitude impact on the with **negligible** significance to the otter population.

Breeding birds

4.5.19 The direct effects on breeding birds primarily relate to the loss of nesting habitats across the PDZ. All the habitats of potential value for nesting birds will be removed; principally dense scrub including gorse, bramble thicket, willow scrub, stands of common reed, and bracken.

4.5.20 Clearance of vegetation and earth moving during the breeding season would also have the potential impact on active nest sites. For most species the breeding season runs from the start of March to the end of August. Loss of the localised areas of dense structured scrub including bramble will result in a reduction in the available habitat within the dock, and dispersal of species from the application site.

4.5.21 The loss of grassland areas will have a negligible effect on ground nesting birds (skylark and meadow pipit) while the stands of Japanese knotweed also provide sub-optimal habitat for nesting birds with no impact from their removal.

4.5.22 The BoCC and/or Section 7 species that could be affected by the loss of scrub include bullfinch, chaffinch, dunnock, goldcrest, linnet, magpie, song thrush and whitethroat, along with Cetti's warbler, protected under Schedule 1.

4.5.23 Indirect effects following the establishment of the construction site will relate to noise, human activity and artificial lighting which will change the context of habitats. Given the operational nature of existing activities in the docks, resident birds will be habituated to background noise and human activity. In this context any indirect effects would be expected to be limited.

4.5.24 In the context of the local populations of Section 7 and BoCC species, the development will locally reduce in the extent of available habitat with a negligible change in the total breeding populations of these species with the docks. All these species are listed as common and widespread in a regional context.

4.5.25 Loss of habitat at Crown Wharf and in TCA1 only have the potential to displace very low numbers of nesting birds. Indirect impacts on nesting birds would relate to noise with a low likelihood of a small number of nesting pairs being displaced from adjoining habitats. There will be elevated noise at dockside reedbed to the north-east of Crown Wharf but it is separated from the construction areas by open water and continued use of the habitat is expected.

4.5.26 Overall, the potential magnitude of impact on breeding birds during construction is defined as moderate which would have significance in a **local** context.

Wintering birds

PDZ

4.5.27 Wintering bird activity will be directly impacted by the loss of habitat and indirectly effected by noise and potentially artificial lighting during activities in the PDZ and at Crown Wharf.

4.5.28 In relation to the direct effects, the main impacts relate to the PDZ. The habitats in this area are provide part of the wintering food source for a range of passerine species and also are used by small numbers of waders (snipe and woodcock).

4.5.29 All species will be displaced and all the habitats within the PDZ used by wintering birds will be lost. There will be a permanent reduction in the habitats available to these species in the dock. The grey willow scrub, mixed species scrub, gorse and bramble all provide shelter and a source of food. The magnitude of the direct effects on the PDZ is high with an effect of significance in a **local** context.

Open Water Dock, Crown Wharf and TCA1

4.5.30 The construction phase will create indirect effects on wintering birds using the open water dock. Activities within and on the edge of the dock at Crown Wharf will result in indirect disturbance through noise, human activity, movement of equipment/ships and artificial lighting. Peak average noise levels will be above 55dB across much of the open water dock throughout the construction period (see Noise Assessment, Hunter Acoustics, July 2023). At this level the behaviour of wetland species would be expected to change. Variation in noise level with intermittent loud noises would also increase the chances of behavioural changes.

4.5.31 Most birds will show a degree of response to noise stimuli. Birds that remain in the affected area may not forage efficiently and if there are additional pressures on the birds then this may impact upon the survival of individual birds or their ability to breed (Cutts et al., 2013).

4.5.32 For auditory disturbance, high level constitutes sudden noise events over 60 dB at the bird or a more prolonged noise of over 72 dB. Moderate level disturbance is classified as a consistent elevated level noise between 60-72 dB over long periods. In areas with existing background noise long-term is regularly above 72 dB disturbance may be moderate where the decibel level does not significantly vary and birds become habituated to it. Low level disturbance is considered to occur where elevated noise is between 45dB and 60dB in rural locations or between 55-72 dB in highly disturbed areas e.g. industrial or urban areas and adjacent to roads.

4.5.33 During construction, modelling of the different construction activities has defined the worst case noise levels around the development. Within the open water dock the levels of noise at the eastern end between Crown Wharf and Margam Wharf and incorporating the adjacent reedbed are predicted to be up to 60 to 65dB which would be a moderate level disturbance with probably sudden noise events creating periodic high level disturbance.

4.5.34 In the central part of the open water dock the predicted worst case noise levels are between 55 and 60dB and in the northern and western section between 45 and 55dB equating to low level disturbance.

4.5.35 The open water dock lies within an industrial context and the species that currently utilise the area will be habituated to vehicle movements, general background noise from operational sites and to a lesser extent human activity, although most of the dock edge is not regularly accessed by people on foot.

4.5.36 It is anticipated that gull species on open water in the south-eastern part of the open water dock will move away from the construction areas to use more distance parts of the open water or alternative roost sites in the wider area.

4.5.37 Other wetland bird species associated with the open water and reedbed would also be expected to disperse further away from the construction area during activities generating long term moderate level noise.

4.5.38 Potential impacts from human activity and artificial lighting around Crown Wharf will be more localised only affecting the immediate vicinity of the dockside construction area.

4.5.39 Worst case noise levels at the River Afan will be below 50dB at the intertidal habitats of the River Afan and at the enclosed harbour construction noise has been modelled as below 40dB. There is no expectation of dispersal or displacement of gulls, waders or other wetland species from these areas.

4.5.40 The open water dock is one of a number of locations in the local that will be used by wintering gulls and other common wetland species including gull roosts within the Tata Steel steelworks.

4.5.41 During periods where there is elevated noise across the majority of the open water dock, temporary displacement is anticipated with birds most likely to move into adjoining intertidal habitat or to waterbodies in the surrounding area.

4.5.42 The magnitude of the impact will be influenced by the frequency and duration of elevated noise events. For the assessment the magnitude of the impact is classified as medium and the effect on wintering bird populations would have significance in the context of the **Site**. Low levels of existing activity are associated with the terrestrial habitats adjoining Crown Wharf and TCA1 and the direct effects on bird activity in these locations will have a **negligible** effect.

Reptiles

4.5.43 Construction activities in the PDZ will result in the loss of multiple areas of grassland adjoining scrub, habitats with confirmed use by three resident reptile species. The habitats within this area

provide prey, cover, refuge and hibernation features with juveniles of all three species recorded within the PDZ. Development in Crown Wharf will also displace very small numbers of grass snake and common lizard which form part of the populations within the PDZ.

4.5.44 The reptile survey indicated the absence of reptiles from TCA1 and no predicted potential impacts on reptiles from the use of this area.

4.5.45 The development will result in the permanent loss of the available reptile habitat with the application site. Indirect effects could occur on reptiles using habitats adjoining the application site. Construction effects relating to noise, human activity and ground vibration would be expected to result in individuals dispersing away from the working area.

Slow-worm

4.5.46 Only one slow worm was only recorded in PDZ development area with adults and juveniles recorded adjacent to the western boundary outside the site where there is a similar mix of grassland and scrub habitats. In the absence of mitigation, the permanent loss of all reptile habitats within the PDZ and Crown Wharf and the potential killing and injury of individuals during construction would be a high magnitude impact on a population of site importance and the adverse effect would have significance in the context of the **Site**.

Common Lizard

4.5.47 The habitat or primary importance for common lizard are the areas of grassland and their loss will permanently remove over 4ha area of grassland habitat that will displace a good-sized population. Common lizard is also widespread in the wider Harbourside Site with past surveys confirming presence in all areas where there is a patchwork of long and short grass with areas suitable for basking.

4.5.48 In the absence of mitigation, the permanent loss of all reptile habitats within the PDZ and Crown Wharf and the potential killing and injury of individuals during construction would be a high magnitude impact on common lizard population with adverse effect of **local** significance.

Grass snake

4.5.49 The habitats supporting a breeding population of grass snake will be permanently lost. In the absence of mitigation, the permanent loss of all reptile habitats within the PDZ and Crown Wharf and the potential killing and injury of individuals during construction would be a high magnitude impact on the grass snake population with adverse effect of **local** significance.

Invertebrates

4.5.50 The development of PDZ will result in the loss of all habitats within the application site. The use of TCA1 will result in the loss of 80% of the open mosaic habitat at Margam Wharf over 2 to 3 years.

4.5.51 The habitats in the application site make a contribution to the value of the whole of the docks for invertebrates. The combination of flower-rich mosaics of open grassland, ephemeral vegetation, banks, hollows, woodland edge, rank grassland and seasonally flooded ground create a wide range of micro-habitats.

4.5.52 Although the habitats within the PDZ are also present in the wider docks their loss will result in a decrease in the extents of these habitat types in the context of the docks as a whole.

4.5.53 A proportion of the regenerating willow scrub across the docks occurs in the PDZ but this is a habitat of lower value for invertebrates.

4.5.54 The habitats within the docks as a whole are exploited by a diverse assemblage of invertebrates, but the PDZ has less variety than other areas including the former mineral extraction and unavoidable losses can be considered in the wider context of docks.

Habitat loss

4.5.55 Overall the permanent habitat loss will reduce the population size of less mobile species and reduce the available habitat for more mobile species. It is assumed that most populations in the planning application site will be lost or will disperse into the alternative habitats within the docks. Based on the invertebrate assemblages recorded in the wider docks it is anticipated that that this would include a small number of invertebrate species whose distribution is centred on the PDZ.

4.5.56 The loss of pioneer vegetation and open regenerating grassland in TCA1 will result in the loss of the habitat mosaic for a minimum of 3 years. The species assemblage using the habitats will be lost/displaced permanently unless the post-industrial habitats are allowed to re-establish over many years to return to pre-construction diversity.

4.5.57 The habitats that will support invertebrate populations located outside the site boundary with further areas of regenerating willow scrub, mixed species scrub, pioneer vegetation and naturally regenerating grassland. The partially vegetated ballast railway embankment immediately adjoining the southern boundary lies outside the application site.

Construction Lighting

4.5.58 Artificial lighting will be a further potential impact on invertebrates during the construction phase with the need for lighting identified in the PDZ at each of the TCAs and at the developments on the dock side.

4.5.59 Based on the use of directional ‘warm light' LED (below 3000 kelvin) the potential magnitude of the effect on invertebrates would be reduced. development and will be expected to result in localised Temporary effects on invertebrate activity in habitats would be expected in thew working areas and adjoining habitats. Point light sources that are visible from further from the site could affect the activity of some invertebrate species in a wider zone including reedbed in the open dock and grassland and bank habitats to the west of the PDZ.

4.5.60 TCA1 lies close to an artificially lit entrance to the Tata Steel steelworks and the Harbour Way and is not classified as being dark corridor. Consequently any effects in this part of the planning application site will be more limited.

4.5.61 The core working hours are outside the hours of darkness and the use of artificial lighting in spring and summer would be periodic when working hours extend beyond sunset. Artificial lighting during winter would be used for a significant proportion of the time, but during a season where invertebrate activity will be low.

4.5.62 Overall the magnitude of the combined impacts on invertebrate assemblage during construction are considered to be medium and the effect is classified as having potential significance in a **local** context.

4.6 Assessment of Operational Effects

Statutory Designated Sites

4.6.1 The potential for the operation of the development to cause a significant effect on the features and/or conservation objectives of Cefn Cribwr SSSI/SAC, Kenfig SSSI/SAC and Crymlyn Bog SSSI/SAC has been reviewed.

4.6.2 Given the level of physical separation the are no potential direct impact pathways between activities associated with operations and any of these internationally designated sites.

4.6.3 Consequently changes due to emissions to is the only potential impact pathway to be considered. The emissions associated with operations and their potential to effect statutory designated sites are presented in Appendix 11.8 of ES Chapter 11 Air Quality.

4.6.4 The modelled levels of NOx, SO2, nutrient nitrogen deposition and acid deposition are set out in ES Chapter 11 Figures 11.2 and 11.3. The effects have been assessed under normal operating conditions i.e. long-term emissions from all on-site point sources and the use of the M4 motorway by operational traffic to provide a 'complete' impact assessment from all potential operational sources.

4.6.5 The predicted concentrations of NOx, SO2, N-deposition and Acid-deposition are all less than 1% of the relevant critical loads (CLs and CLOs) at each of the internationally designated sites for the development and in-combination with other committed developments. Therefore the emissions are deemed to be negligible for annual mean NOx, annual mean NH3, N-deposition and Acid deposition.

4.6.6 The modelling assessment has concluded that any effect would be negligible in respect of emissions. The details of the modelling is provided in Appendix 11.8.

4.6.7 It is concluded that there are no direct or indirect pathways associated with operational activities that would adversely affect the conservation status of any statutory internationally designated nature conservation sites, i.e. there would be no likely significant effect (LSE).

4.6.8 On this basis a shadow Habitat Regulations Assessment (HRA) is not considered to be a requirement.

Non-statutory Designated Sites

Air Quality

4.6.9 The predicted operational emissions associated with both on-site point sources and operational traffic, have been assessed in relation to the SINC sites and ancient woodland in the locality.

4.6.10 The air quality modelling has confirmed that the on-site point source emissions of NOx, SO2, N-deposition and Acid-deposition have modelled concentrations of less than 1% of the relevant CLs and CLOs at the Little Warren SINC, Lower River Afan SINC, Harbourside SINC, Bryn Goytre SINC and in all areas of ancient woodland, are deemed negligible.

4.6.11 For a section of the River Afan (located in the NPT Watercourses SINC), the process contribution (PC) is 1.1% of the CL for NOx deposition, but below 1% of the CL for SO2, N-Depostion and acid deposition. Further analysis of the NOx emissions shows that the PEC is less than 70% of the CL at this SINC site with the threshold for potentially significant effects on locally designated sites defined as 100% of the CL or greater.

4.6.12 Consequently the potential AQ effects on all SINCs from emissions to air is therefore concluded as not significant. The sensitivity of the ecological receptors is considered to be high. The magnitude of change is considered to be negligible. Therefore, there is likely to be a direct, permanent, long-term negligible effect.

Noise

4.6.13 There are no potential direct effects on any SINC sites associated with the operation of the PDZ or marine unloading and loading facility due to lighting, or visual disturbance from human activity due to the distance and separation between the SINCs and the operations.

4.6.14 The modelling of operational noise levels generated by the main development and noise levels associated with marine loading and unloading facility (including the unloading of ships by pump over an 18 hour period has confirmed that the intertidal habitats would typically be subject to additional noise levels below 40dB Laeq during the day and night. The use of the emergency flare is the only period when the habitats associated with the SINC designation would be exposed to

noise between 40dB-45dB. Very short term elevated noise would occur during ship movements on the tidal river to enter the dock.

4.6.15 These would only occur at high tide when there is very low levels of use by birds with no potential adversely affect any bird species or populations. Periodic ship movements into and out of the dock at high tide will not adversely affect any features for which the SINC is designated.

4.6.16 The intertidal habitats are the primary reason for the designation of this section of river as a SINC and the status of the designated site would remain unaffected with no significant effect at any geographic scale.

Habitats

4.6.17 No habitats will be retained within the application site with no potential for additional effects during the operations of the proposed development.

Japanese knotweed control and eradication

4.6.18 Treatment of Japanese knotweed regrowth through areas of unsealed hardstanding is likely to be an ongoing requirement within the operational site for at least the first few years of operation. This could affect the establishment of flower-rich grassland in landscaped areas around the truck loading facility, administration area and alongside the internal road on the western boundary.

4.6.19 It is anticipated that any Japanese knotweed shoots emerging in landscaped areas will have a localised distribution and would be subject to herbicide spot treatment or stem injection minimising the effects on other vegetation and habitats in which they occur. A glyphosate based herbicide which is absorbed by plants through foliage / stems and breaks down when in contact with soil with minimal take up by roots would enable targeted control alongside sensitive vegetation.

4.6.20 When the modular biodiversity walls are created a root barrier membrane will be installed beneath them to prevent Japanese knotweed growing up through these structures.

New habitats

4.6.21 Areas of flower-rich grassland and pioneer vegetation will be established on post-industrial substrates equivalent to similar habitats that thrive with minimal management throughout the docks. The habitats have been designed to have an open vegetation cover with herbs occurring at a high abundance than grasses. Monitoring of natural colonisation and regeneration will be ongoing. Management actions will be designed to achieving and maintaining high diversity target conditions. Both elements will be subject to a post-development habitat management plan.

4.6.22 The green/brown roof on the administration building will be designed with biodiversity features and will be subject to regular maintenance.

4.6.23 Good housekeeping and maintenance would remove or control potential adverse factors relating to daily operations. Standard operational use of the site will not adversely affect created habitats.

4.6.24 There are no predicted effects on the habitats adjoining the PDZ or Crown Wharf developments during the operational phase.

4.6.25 The establishment of new habitats and eradication of Japanese knotweed from the PDZ through ongoing herbicide treatment of regrowth as part of standard site maintenance operations will be **beneficial** in a **Site** context.

Faunal Species

Bats

PDZ

4.6.26 Various wildlife species may respond differently to a ultra violet (UV) rich spectral composition depending on how reliant they are on darkness and a warmer light colour would be preferred; many nocturnal animals may continue their social habits and feeding behaviours with increased activity in the area while others may decrease their activity and possibly desert their habitat.

4.6.27 Artificial lighting alongside the internal roads and on buildings within the PDZ will permanently change the lighting conditions across the development site and on the boundaries. The background operating noise would not affect the use of this feature by foraging or commuting bats.

4.6.28 Scrub habitats on the boundary of the development, outside the development area will have an altered context including willow scrub adjacent to the western boundary and adjoining the south-eastern boundary of PDZ.

4.6.29 The plant will be operational 24 hours a day and light levels on the site boundary will have the potential to influence the behaviour of bat species. None of the species recorded with the development area have high sensitivity to light and foraging was observed in the vicinity of streetlights on the side the Phoenix Way.

4.6.30 Few species will be affected, with common pipistrelle the only species regularly foraging in the site and immediate surroundings. The construction impacts will reduce the connections between potential foraging habitat and artificial lighting will affect remaining corridors on the site boundary.

4.6.31 A 500m long tree belt and 35m wide north facing grassland bank lies 50m south of the PDZ on the southern side of the sidings. This feature will not be subject to any additional light spill and will remain a linear east-west bat flight line.

4.6.32 Willow scrub to the south-east of the PDZ also forms on east-west flighting on the northern side of the sidings. This area of scrub adjoins a large reedbed and is assumed to be regularly used as a bat flight line. The potential effect of operational lighting on bats would be moderated by the site's location in an area that is subject to widespread artificial lighting. Relatively low levels of activity where associated with the unlit site boundaries. With the removal of habitats within the PDZ, Crown Wharf and TCA1 the impact magnitude on local populations is classified as low but could have an effect of significance in the context of the Site.

Otter

4.6.33 Operational noise levels will result in an increase in noise levels across parts of the open water dock in the day and during the night time. A small part of the dock would be subject to light spill from the marine loading facility so that it is 'suitably and adequately lit'.

4.6.34 Otters will be primarily using the habitats in the River Afan, which is higher quality habitat with varied prey items at high and low tide. As an operational dock partially boundary by industries, any individual otters that currently use the dock will be habituated to lighting, background noise and human activity.

4.6.35 Otters can tolerate considerable levels of artificial lighting (they are known to travel through built-up areas), but it is recognised that in some circumstances lighting can affect otter behaviour.

4.6.36 The proposed development has the potential to result in a permanent localised increase in artificial lighting on one section of the dock margin. The adjoining operational land to the west is already floodlit and there many streetlights close to the edge of the dock.

4.6.37 There development will not create any additional physical barriers to the movement of otters between the River Afan and the open water dock. Otter activity may change during the brief periods when ships move in and out of the dock.

4.6.38 Environmental protection measures will ensure that water quality is not adversely affected. There will not change the abundance of prey species.

4.6.39 The open water dock would remain a foraging habitat available to this species with potential avoidance limited to the small section around the marine loading facility. In relation to the local otter population the potential magnitude is negligible and the effect would not be significant in any geographic scale.

Birds

PDZ

4.6.40 Habitats adjoining the boundary of the PDZ will be subject to light spill (above 0.5 – 1 lux) and have lower potential value for nesting birds, with lighting associated with changes in behaviour and potential declines in chick survival. The adjoining habitats would also be subject to an increase in noise due to the operation of the site.

4.6.41 The willow scrub and bramble habitats outside the development boundary would be expected to support small numbers of nesting pairs, potentially including BoCCW species such as whitethroat.

4.6.42 Under a precautionary assessment a level of avoidance/displacement is likely to occur from habitats adjoining the operational areas in PDZ.

4.6.43 Potential nesting habitat adjoining the marine loading and unloading facility is limited and the lack of observations of breeding bird activity in this zone indicates that any operational effect will be negligible. Overall, the operational effects will have at most a low magnitude effect and would not have significance in any geographic context.

Open Water Dock

4.6.44 Noise modelling has been completed to a number of scenarios relating to the operation of the PDZ, periodic flaring, generator testing, marine loading and unloading facility and ship movements. The detailed modelling is presented in Appendix 12.2. There is a degree of uncertainty in the source noise data used in the modelling as the scheme is not yet fully designed, and the full plant noise data is not currently available.

4.6.45 Overall, typical operational noise levels identified is considered low outside of the southern and eastern sections of the open water dock. Most of the eastern section of the open water dock including part of the reedbed will be subject to slightly elevated noise, between 50 and 55dB with lower noise levels in other parts of the open water dock, below 50dB.

4.6.46 During normal operations, average noise levels in the open water adjoining Crown Wharf will be between 55dB and 60dB increasing to 60-65dB at the dock edge.

4.6.47 During ship off-loading activities (which will take up to 18 hours and would occur once every 7-14 days) there will be periods of higher noise levels in the dock with approximately 70% of the open water subject to 50dB – 60dB with localised high noise 65dB to 80dB at the unloading facility and in adjoining section of open water.

4.6.48 Ship movements along the tidal river at night also has predicted noise levels of 50-60dD across the open water, with higher noise directly next to the ship.

4.6.49 The development is located near to a well-established industrial areas and have an industrial noise component in their existing sound climate.

4.6.50 During standard operations some changes in bird activity are anticipated. It is generally recognised that noise below 45dB is considered unlikely to result in changes in bird behaviour, especially where birds occur in industrial areas where the population is habituated to noise and human activity.

4.6.51 The most numerous species are gulls, which have a high tolerance to industrial activities. Gull flocks should continue to roost/loaf in the parts of the open water dock where the noise levels are below 50dB with only the small area of open water closest to the loading facility is likely to be avoided.

4.6.52 During periods of unloading the effect of displacement is expected to be more marked.

4.6.53 The level of effect on birds will be reduced by the context of the dock and the existing habituation of birds to industrial activities. The overall assemblage of common wetland species wintering and/or nesting in the dock should not significantly change when the proposed scheme is operational.

4.6.54 Outside the open water dock, a range of bird species use habitats in the Lower River Afan Estuary SINC, primarily gull flocks and but also wildfowl and wader species which generally occur small numbers at low tide; including curlew, redshank, lapwing, oystercatcher and mallard.

4.6.55 Ship movements will be at high tide when all the intertidal habitats will be covered and there are no anticipated effects on foraging. Individual birds roosting on the sides of the channel at high tide would be very unlikely to disperse from the area due to the movement of a ship. .

4.6.56 Overall the magnitude of the impact will be low to medium and any effect is not considered to have significance in the context of the **site**.

Reptiles

4.6.57 Reptiles will be present in habitats to the west of the PDZ which lie within the ABP Temporary Reptile Mitigation Area. Previous surveys undertaken on behalf of a third party (XLCC) on the land to the west of the PDZ recorded populations of slow worm and common lizard in grassland and on the boundaries of the scrub habitats.

4.6.58 No reptiles were recorded in the open sparsely vegetated ground in the railway sidings to the south but are present in the adjoining scrub habitats.

4.6.59 The habitats that are being created within the operational site will have negligible value for reptiles. No predicted additional adverse effects on reptiles associated indirect effects of lighting and background noise from the PDZ operations.

Invertebrates

PDZ

4.6.60 It is recognised that artificial lighting can alter the behaviour of invertebrate species and change the distribution of invertebrates with a high proportion of species being nocturnal or partially nocturnal.

4.6.61 Many invertebrate species will move towards lights from surrounding unlit areas. This change in behaviour with potential adverse effects on populations through a number of factors including an increased susceptibility to predation and depletion of populations in the surrounding habitats.

4.6.62 The operational site will emit artificial light from external lighting and there will be some level reflected light from lit surfaces within the development. The development will be lit 24hrs a day. The lighting specifications are for warm light LED units with less than 3000 kelvin which have lower effects on wildlife.

4.6.63 Where consistent with operational requirements additional mitigation will be implemented through the use of night time controls to limit the duration and intensity of artificial lighting in areas that are not in frequent use.

4.6.64 Light spill on the boundaries of the PDZ onto the adjoining habitats will reduce their value for invertebrates. Point light sources have been minimised through incorporated shielding and cowls but some lighting features will remain visible from outside the site and would be expected to attract invertebrates.

4.6.65 The magnitude of the impact on invertebrates will be influenced by the value of the habitats affected for invertebrates.

4.6.66 The existing operational site, Hanson cement works, and streetlights along the Phoenix Way create existing light spill along the northern boundary of the PDZ and at Crown Wharf. In contrast much of the PDZ and boundaries are currently dark, with only the eastern and north-eastern boundaries being subject to light spill from artificial lighting.

4.6.67 Floodlights in Tata Steel steelworks operational areas also limit the extent of dark corridors in the wider context.

4.6.68 Habitats beyond the site boundary will be subject to minor light spill. Effects in habitats to the north and east of the PDZ would have limited effect given the existing levels light spill.

4.6.69 The potential effect will be greater to the west and south where light point sources could attract invertebrates from grassland, scrub and plantation woodland in the vicinity of the PDZ. The movement of individuals away from these areas would be expected to affect populations and the potentially the species assemblage.

4.6.70 The scrub, grassland and banks habitats to the west have confirmed value for invertebrates, while the grassland and tree belt will also support an assemblage of species.

4.6.71 Features being created within the operational site including the biodiversity walls and insect hotels will be subject artificial lighting and could affect the assemblage of species that utilise them.

4.6.72 The magnitude of the impact has been reduced through the shielding of point light sources to minimise visibility outside the site.

Marine Loading and Unloading Facility

4.6.73 Lighting will also be used at the facility on the edge of the dock. Details of the operational lighting requirements have not yet been defined. The facility will be located in close proximity to the Hanson operational site on the southern side of the open water dock, to the west of Crown Wharf. The use of directional lighting for their 24 hr operational site creates very limited light spill onto the open water dock.

4.6.74 The marine loading and unloading facility will permanently introduce additional sources artificial light within the dock. It is envisaged that the use of directional lighting at the facility will result in similar controls on light spill minimising effects on the sides of the dock and marine environment.

Overall

4.6.75 Overall the magnitude of the impact to invertebrates is predicted to be medium and the effect is classified as having significance in the context of the **Site and immediate surroundings**.

5 ADDITIONAL MITIGATION/MONITORING

5.1 On-site Habitat Creation

5.1.1 Flower-rich grassland, pioneer vegetation, modular biodiversity walls and the green/brown roof(s) will be subject to annual monitoring for a minimum of five years from the start of operation to assess the extent to which plant populations are establishing in the green space.

5.1.2 A low intensity management approach would be adopted, appropriate for the habitats being created in the PDZ. The open grassland would be subject to the removal of colonising shrubs (periodic cutting) and the control of the perennial weeds (thistles, common nettle and docks).

5.1.3 Long term management of the on-site habitats will be adapted to promote floristic diversity. Periodic cutting and removal of arisings will be adopted where dominant plants lower the diversity and value.

5.2 ABP Off-site Habitat Compensation

5.2.1 Separate to Project Dragon, Associated British Ports (ABP) is promoting proposals for the Future Ports: Port Talbot Programme (FPT) and an associated programme of ecological mitigation, including acquiring land in the vicinity of Port Talbot to ensure that mitigation is delivered for FPT and Project Dragon. ABP and Lanzatech have reached agreement that, if required and agreed to be as a suitable site as part of the liaison process with NPTC, that the land it has acquired will be able to be utilised for Project Dragon.

5.2.2 The Project Dragon off-site mitigation proposals are being developed in light of those programmes and in liaison with ABP and NPTBC to ensure that:

- the impacts of Project Dragon are mitigated and a NBB outcome is secured;
- the mitigation is reactive to and appropriate for the land that is able to be utilised for the purposes of delivering the off-site mitigation;
- mindful that the land is not control of LanzaTech, seeking to apply where it is possible to do so.

5.2.3 The proposed off-site mitigation and enhancement outcomes at the chosen off site location will address the ecological and biodiversity effects of Project Dragon. Wherever possible, compensation for adverse effects on Section 7 habitats will be like for like, but where a habitat type cannot be directly compensated, alternative habitat compensation will come forward to ensure that an overall balance is positive and that NBB is delivered.

5.2.4 It is anticipated that woodland /scrub compensation will be brought forward for the losses of low-value self-sown willow scrub, mixed species scrub, and gorse. It is also anticipated that grassland compensation will be provided off-site to fully offset unavoidable effects on coastal grassland, and naturally regenerated grassland. Off-site compensation will also address the loss of biodiversity value associated with habitat change in TCA1.

5.2.5 It is expected that the delivery of the ecological mitigation will be subject to a suitably worded planning condition to any granting of planning permission for the Proposed Scheme, or planning obligation so that NPTCBC can ensure the mitigation occurs.

5.2.6 Biodiversity compensation and enhancement will be a combination of port based and significant off-site measures to ensure biodiversity gain is achieved to meet the requirements of Environment (Wales) Act 2016 and Planning Policy Wales (PPW 11).

5.3 Legislation Compliance

5.3.1 All construction and operational activities with the potential to affect legally protected species would be subject to precautionary measures to be consistent with environmental good practice and to comply with wildlife legislation.

Japanese knotweed - Biosecurity Procedures

5.3.1 A detailed Biosecurity Plan will be prepared for all enabling works and construction activities in the PDZ. The vegetation clearance and earthworks during enabling works will high risks of spread of Japanese knotweed. Although the herbicide treatment and removal of the Japanese knotweed crowns ahead of these activities should significantly reduce the vigour of the plant. All areas of bare soil within the PDZ construction area could contain viable Japanese knotweed rhizome.

5.3.2 Consequently robust cleaning procedures will be implemented and enforced for the duration of construction. All vehicles and clothing and footwear must be thoroughly cleaned, with all soil completely removed, prior to leaving the working area and moving onto the Phoenix Way.

5.3.3 Separate designated hard surfaced vehicle and footwear cleaning areas will be established close to all exits from the PDZ and will be operational from the outset of enabling works.

5.3.4 Any person entering the PDZ construction site will be legally responsible for fully adhering to the mandatory biosecurity procedures with LanzaTech holding ultimate responsibility for compliance across all contractor teams.

5.3.5 Other Schedule 9 Plant Species including montbretia and wall cotoneaster are present in localised areas within the PDZ. The contractor will excavate all plants, corms, and roots of these species under an ecological watching brief in advance of large-scale vegetation clearance and ground remodelling. All excavated plant material of these species would be incinerated in a nominated control area within the working site.

5.3.6 Following good practice sea buckthorn a further non-native species (but not listed under Schedule 9) will also be treated the same way to avoid transfer of viable plant material within the PDZ.

Fauna

Reptiles

5.3.7 The conservation of the reptile species is an integral part of the Japanese knotweed control being undertaken by ABP in the PDZ development area. All three reptile species are being relocated into species-specific receptor habitats in a temporary reptile mitigation area in the wider docks.

5.3.8 A 19ha area of the wider docks is being used by ABP as a temporary reptile mitigation area for the species being re-located from the PDZ for the JKW works and to ‘pre-mitigate’ the impacts of the of the proposed development.

5.3.9 With reptile populations already present in the mitigation area a series of receptor habitats areas and habitat modifications have been completed in advance of the relocation to provide multiple additional refuge, hibernation features alongside the management of uniform long grassland and dense bracken to create mosaics of open ground and dense cover in locations where there will be good prey populations.

5.3.10 Specifically designed hibernation and refuge features have been created across the temporary reptile mitigation area. The carrying capacity of the receptor habitats will be higher than the worst-case population size for each of the species being moved.

5.3.11 ABP is relocating the reptile populations from the PDZ in 2023 prior to herbicide treatment and the stripping of crowns.

5.3.12 ABP have installed a semi-permanent reptile exclusion fencing around the boundary of their working area. The ABP exclusion fence is set back from the boundary of the PDZ construction area to the south and west. and. Ongoing maintenance of the fence as a continuous barrier will be ongoing until the start of the construction.

Slow-worm

5.3.13 Only one slow worm was recorded in PDZ development area with adults and juveniles recorded adjacent to the western boundary outside the site where there is a similar mix of grassland and scrub habitats. The ABP relocation of small numbers of slow worm into the adjoining scrub and grassland habitats will have a low magnitude impact on the population and have negligible significance. Under a more precautionary assessment based on slow-worm being under recorded the effect of ABP relocation would have significance in the context of the Site.

Common lizard

5.3.14 The habitat or primary importance for common lizard are the areas of grassland and their loss will permanently remove over 4ha area of high-quality habitat that will displace a good-sized population. Common lizard is also widespread in the Temporary Mitigation Area with past surveys confirming presence in all areas where there is a patchwork of long and short grass with areas suitable for basking.

5.3.15 The ABP creation of hibernacula and log refuges in close proximity to areas of enhancement where uniformly rank grassland has been modified to create more structurally varied patchworks will create new features for the relocated common lizard population.

Grass snake

5.3.16 Grass snake are being relocated by ABP from the PDZ to the former mineral extraction area, 700m to the west, which comprises extensive grassland and a 1ha reedbed/ waterbody in an area with very varied topography. Additional refuge and hibernacula features have been created adjoining the rank grassland on the banks of sides of the former extraction area.

Nesting birds

5.3.17 During bird nesting season (between the start of March to August inclusive) prior to works that involve the removal of vegetation (trees, scrub, bramble, bracken, grassland) or the initiation of activities on extensive open ground, inspections/ surveys for nesting birds will be completed comprising inspections for nests in vegetation and observations of any territorial activity. These precautions relates to each part of the application site includingTCA1 ; and will be required for trees, shrubs, dense ground vegetation and sparsely vegetated ground.

5.3.18 To avoid effects the construction programme will seek to establish cleared working areas in advance of the breeding season wherever reasonable and practicable. The construction teams will be legally responsible for protecting any active nest sites if established in the working area with a minimum stand off of 5m.

5.3.19 Cetti's warbler is the only species protected under Schedule 1 that could breed within the application site. The presence of an active nest of this species would require a larger buffer zone of at least 25m to avoid disturbance of adult birds at the nest.

General

5.3.20 Vegetation clearance in the construction area will be undertaken systematically following standard good practice to enable faunal species to disperse away from the development into surrounding habitats.

5.3.21 All excavations must be constructed with escape routes for wildlife to prevent entrapment which could include soil ramps or planks. Alternatively, excavations can be completely covered overnight.

Bats

5.3.22 The proposed off-site mitigation and enhancement outcomes to address the ecological and biodiversity effects on bats might include:

– Provision of bat boxes, and creation of standing deadwood aligned to increasing in the number of oak trees.

– Grassland and woodland edge habitat enhancements to increase abundance of invertebrate species on which bats prey.

Birds

5.3.23 The proposed off-site mitigation and enhancement outcomes to address the ecological and biodiversity effects on birds might include:

– Woodland habitat enhancements to create new habitats for breeding birds in the short and medium term.

– New nest sites including barn owl boxes to be installed on mature trees adjacent to potential foraging habitat.

– Mixed species scrub planting to broaden the resources available to birds in the breeding season and winter.

Invertebrates

5.3.24 The proposed off-site mitigation and enhancement outcomes to address the ecological and biodiversity effects on birds might include specific habitat creation for invertebrates including the provision of deadwood, purpose- built banks, and grassland with incorporated micro habitat diversity.

5.4 Environmental Protection

5.4.1 During construction environmental protection will be achieved through the implementation of a detailed Construction Environment Management Plan and Construction Waste Strategy. All surface water run-off generated during construction will be controlled on the Site to prevent pollution in accordance with Guidance for Pollution Prevention (GPPs) and will be proactively managed throughout the construction phase.

5.4.2 An environmentally sensitive lighting schemes will be designed for the construction and the operational development to minimise artificial light spill outside the boundary of the application site. Construction lighting and the permanent lighting scheme will be developed with reference to the recommendations published by the Institution of Lighting Professions and Bat Conservation Trust (BCT and ILP, 2018).

5.4.3 The scheme will ensure that each part of the site is ‘suitably and adequately lit’ for essential operational reasons. LED lamps would be used, with 'warm white' selected as a preference on the site boundaries with colour temperatures of below 4000K (and ideally below 3000K for LED lights) where compatible with minimum operational requirements. Lighting units will be selected to

minimise upward and lateral light spill. The lighting assessment includes a number of measures to reduce light spill at the site (AECOM, 2023) that should be incorporated into the detailed lighting design to achieve the protection of habitats on the site boundaries and avoid degradation of their potential value from operations.

5.4.4 These measures will help protect the context of existing habitats on the boundary of the operational site. In the future a network of green / brown corridors is to be created as part of the port-wide biodiversity compensation strategy.

6 RESIDUAL IMPACTS

6.1 Residual Construction Effects

6.1.1 The residual construction effects on designated sites, habitats and species is presented in Table 6.1.

Designated Sites

6.1.2 There are no residual construction effects on any statutory or non-statutory designated sites.

Habitats

Permanent loss

6.1.3 Permanent loss of all habitats within the PDZ will be unavoidable. With only localised areas of landscaping possible within the built facility, there will be unmitigated residual effects on all habitats within the PDZ, Crown Wharf and TCA1 West. These specifically relate to the permanent loss of coastal grassland and dune slack vegetation (Section 7 habitat), the permanent loss of naturally regenerated grassland (equivalent to SINC status), the permanent loss of scrub habitats. The existing post-industrial substrates in TCA1 will be re-exposed and the bare ground. If left to naturally regenerate the adverse impact would be reversed over time with the likely re-establishment of OMH, and oxtongue broomrape colonies that had been lost. It would take a number of growing seasons for a residual effect to have negligible significance (minimum 5 years, post decommissioning). Continued use of TCA1 and permanent loss of habitat would result in a residual effect of local/district significance.

6.1.4 The grassland types in the PDZ are subject to ongoing invasion by JKW, scrub and bramble and their value will continue to decline over time eventually succeeding to Japanese knotweed and regenerating young willow.

6.1.5 The off-site compensation will enable full compensation for the remaining residual impacts. These measures together with the on-site proposals will create overall residual effect on habitats that will be beneficial at least in a site context.

Species

6.1.6 Due to the nature of the built development, there will be unavoidable unmitigated residual effects on species within the application site due to the loss of habitats. In the context of the docks residual effects of potential local significance will occur for breeding birds, wintering birds, invertebrates and oxtongue broomrape.

6.1.7 The off-site compensation will have benefits for breeding birds, bats and invertebrates, compensating for direct effects and delivering enhancements for additional species.

6.1.8 Adverse construction residual effects of site significance will remain for the wintering bird assemblage due predicted changes in the use of the open water dock from indirect impacts over the construction period.

Reptiles

6.1.9 Works undertaken by ABP, creating a Temporary Reptile Mitigation Area in the Harbourside site have addressed the impacts on grass snake, common lizard, and slow-worm. A residual effect of site significance is a possible outcome for grass snake while the residual effect for the other two species the residual effect would be neutral.

6.1.10 Only one slow worm was only recorded in PDZ development area with adults and juveniles recorded adjacent to the western boundary outside the site where there is a similar mix of

grassland and scrub habitats. The ABP relocation will move relatively small numbers of slow worm into the adjoining scrub and grassland habitats will have a low magnitude impact and the effect would not have significance in any geographic context.

6.1.11 The habitat or primary importance for common lizard are the areas of grassland and their loss will permanently remove over 4ha area of high-quality habitat that will displace a good-sized population. Common lizard is also widespread in the Temporary Reptile Mitigation Area with past surveys confirming presence in all areas where there is a patchwork of long and short grass with areas suitable for basking. The ABP creation of hibernacula and log refuges in close proximity to areas of enhancement where uniformly rank grassland has been modified to create more structurally varied patchworks will create new features for the relocated common lizard population. In the context of the ABP habitat enhancement and relocation, the magnitude of the impact on common lizard would be minor and not have significance in any geographic context.

6.1.12 A population of grass snake is being relocated from the PDZ to the former mineral extraction area, 700m to the west which comprises extensive grassland and a 1ha reedbed/ waterbody in an area with very varied topography. New refuge and hibernacula features have been created on sparsely vegetated ground adjoining the rank grassland on the banks of sides of the former extraction area. The permanent loss of breeding habitat within the PDZ is a medium magnitude impact and following habitat enhancement and relocation will have an effect of significance in the context of Site.

6.2 Residual Operational Effects

6.2.1 The residual operational effects on designated sites, habitats and species is presented in Table 6.1.

Designated Sites

6.2.2 There are no predicted residual operational effects on any statutory or non-statutory designated sites.

Habitats

6.2.3 The treatment of Japanese knotweed regrowth and eradication from the developed PDZ will have successfully removed a very substantial area of this invasive non-native species.

Species

6.2.4 Under a precautionary approach the residual operational effects on faunal species have been classified as negligible (adverse) for foraging bats, otter, and breeding birds. No specific additional measures are proposed.

6.2.5 For wintering birds it is possible that the levels of use of the parts of open water dock closest to Crown Wharf could change during some operational activities as a result of background noise, artificial lighting and/or human activity on the edge of the dock. It is predicted that any change would be minor and limited in duration. The effect would be no greater than adverse in a site context.

6.2.6 For invertebrates, indirect residual effects of site significance could arise as a result of the indirect effects of operational lighting on habitats outside the operational areas.

6.3 Ecosystem Resilience

6.3.1 The landscaping proposals in the PDZ is designed around more diverse habitats that have naturally regenerated on post-industrial and sandy substrates across the docks. Conditions that

have naturally developed species diverse and flower-rich vegetation will be replicated on the boundaries of the PDZ. The operational requirements of the facility have restricted their extent and all available land has been brought into the landscape scheme. The substrates used to create flower-rich vegetation will be varied to create different types of low nutrient substrate.

6.3.2 The bespoke designed modular biodiversity walls will provide a significant 3-dimensional habitat for pioneer plant communities and some invertebrate species. Fill materials will be stone/rubble with some low nutrient soil/substrate. Variation in the types of fill materials, construction techniques and ratio of stone to soil on the faces and top will increase structural diversity and the microhabitats for invertebrates.

6.3.3 The landscaped areas will create habitat 'stepping stones' to the south of the Phoenix Way and make a small contribution to the port-wide biodiversity strategy.

6.3.4 All the landscaped areas within the PDZ will also be subject to biodiversity monitoring and management aligned to maximising the value of the created features as ecosystems.

6.3.5 The off-site compensation proposals will be designed to create resilient ecosystems. The off-site compensation site will facilitate the restoration of many habitat types with potential high biodiversity value that are currently in unfavourable condition due to loss or degradation as a result of natural succession and agricultural management practices. Restoring diversity of high value habitat types that have been lost and increasing the extent of these habitats that are in good condition is consistent with best practice to reinstate and safeguard features that would otherwise be lost. The areas of grassland and woodland are part of a complex of habitats a context which increases the potential value of each of the component habitats.

6.3.6 The off-site compensation will also be able to provide an important linkage between multiple statutory and non-statutory designations this connectivity has value for biodiversity in the context of the county.

7 SUMMARY

7.1.1 The proposed development will deliver a net benefit for biodiversity through the combination of:

- On-site mitigation and enhancement measures including the provision of small multi-functional landscaped spaces on the boundary of Project Dragon.
- Habitat restoration and enhancement outcomes at the chosen off-site biodiversity compensation site.

7.1.2 The proposed commercial agreement between LanzaTech and ABP in respect of the use of acquired land for mitigation and compensation proposals confirms deliverability.

7.1.3 It will also give flexibility to allow for maximum collaboration between ABP, LanzaTech and the Council. This flexibility will ensure a comprehensive approach that will maximise the quality of net biodiversity benefit delivered as part of Project Dragon, taking into account of the wider interests in the regeneration of the port as a whole.

Table 6.1: Summary of Likely Environmental Effects on Ecology and Nature Conservation

Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact	Significance of effect (Adverse unless stated)	Additional Mitigation/ Compensation	Residual Significance of effect (10 years)
Construction Phase							
Designated Sites							
Kenfig SSSI/NNR/SAC	International	None	n/a	No change	None	n/a	No change
Crymlyn Bog and Pant y Sais SSSI/NNR/SAC	International	None	n/a	No change	None	n/a	No change
Non-statutory designated sites	County	Indirect impacts from noise	n/a	Negligible	None	n/a	No change
Habitats							
Scrub (Willow)	Site	Permanent loss of regenerating willow scrub within the PDZ	Long term	High	Site	ABP off-site compensation	Site (Beneficial)
Grassland	Local/District	Permanent loss of naturally regenerated grassland on former industrial site habitat.	Long term	High	Local	ABP off-site compensation	Site (Beneficial)
Coastal grassland and dune slack	Local	Permanent loss of small extent sof Section 7 habitat.	Long term	High	Local	ABP off-site compensation	Site (Adverse)
Mixed species scrub, gorse and bramble	Site	Permanent loss of mixed scrub, gorse bramble and bracken during construction	Long term	High	Site	ABP off-site compensation	Site (Beneficial)
Seasonally waterlogged ground	Site	Permanent loss of habitat	Long term	High	Site	None	Site (Adverse)
Open mosaic habitat (OMH) and ephemeral vegatation	Local/District	Permanent (possibly temporary) loss/disturbance of OMH for duration of construction Permanent loss of 0.2ha habitat in PDZ	Medium Term	High	Local/District	Creation 0.4ha flower-rich pioneer vegetation Creation of modular biodivesity walls 350m in length Creation of biodiverse green roof on the administration building Small green/brown roofs on site entrance building and gatehouse ABP off-site compensation	Site (Beneficial)
Species							
Oxtongue broomrape	LocalPartial	Partial loss of colony in Margam Wharf for at least the duration of construction, anticipated to be permanent Partial loss of host plant population (hawkweed oxtongue)	Medium term	Medium	Local		Local (Adverse)
Bat species - Foraging	Up to Local	Permanent loss of foraging habitat and flightlines - primarily scrub edge habitat	Long term	Medium	Site (common pipistrelle) Negligible (Other species)	Retention of network of corridors and flightlines in wider dock ABP off-site compensation to include enhancement of foraging habitat and habitat management for bats	Site (Beneficial)
Otter	Up to Local	Noise from construction resulting in changes in foraging behaviour, temporary avoidance of parts of the open water dock close to development activities	Short term	Low	Negligible		Negligible

Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact	Significance of effect (Adverse unless stated)	Additional Mitigation/ Compensation	Residual Significance of effect (10 years)
Breeding birds	Local	Permanent loss of nesting habitat (scrub, bramble, shrubs and trees). Disturbance of adjacent habitats from construction noise and lighting.	Medium term	Medium	Local	ABP off-site compensation through habitat creation and managementl; including grassland management for ground nesting birds	Negligible
Wintering birds (PDZ)	Local	Permanent loss of winter resource for birds (scrub, bramble, shrubs and trees)	Long term	High	Local	-	Site (Adverse)
		Disturbance of adjacent habitats from construction noise and lighting.	Short term	Low		-	Site (Adverse)
Wintering birds (Open water dock)	Local	Disburbance of wintering birds associated with open water dock	Short term	Medium	Site	-	Local (Adverse)
Common lizard	Local	Permanent loss of the population within the PDZ and Phoenix Wharf; displacement from habitat as part of treatment of extensive stands of JKW	Long term	Medium	Local	ABP capture and relocation to prepared receptor habitats. ABP enhancement measures in wider port to create habitat mosaics/edge habitat, refuges and hibernation features	Neutral
Slow worm	Site	As above	Long term	Medium	Site	As above	Neutral
Grass snake	Local	As above	Long term	High	Local	As above	Site (Adverse)
Invertebrates	Local	Permanent loss of invertebrate habitats – removal of scrub, reedbed and grassland Loss of OMH in TCA1	Long term	Medium	Local	On-site creation 0.4ha flower-rich pioneer grassland and modular biodivesity walls Installation of insect hotels ABP off-site compensation including habitat creation for invertebrates	Neutral
Invasive plant species	None	Potential for spread during construction activities	Short term	Low	Moderate	Robust biosecurity control procedures	Negligible
Operational Phase							
Designated Sites							
Kenfig SSSI/NNR/SAC	International	None	n/a	No change	No change	-	No change
Crymlyn Bog and Pant y Sais SSSI/NNR/SAC	International	None	n/a	No change	No change	-	No change
Lower River Afan Estuary SINC	County	None	Long term	Low	No change	-	No change
Other Non-statutory designated sites	County	None	n/a	No change	No change	-	No change
Habitats							
Open mosaic habitat/ green roof	Site	Damage / disturbance of biodiversity features from operational activities	Long term	Low	No change	On-site management of open structured grassland, biodiversity walls and green roof	Site (Beneficial)
Invasive plant species	None	Development over land contaminated by JKW encapsulating remaining rhizome	Long term	High	Site, beneficial	On-site control of any regrowith on site boundaries	Site (Beneficial)

Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact	Significance of effect (Adverse unless stated)	Additional Mitigation/ Compensation	Residual Significance of effect (10 years)
Species							
Bats - Foraging/commuting	Site	Light spill onto sidings and habitats adjoining the PDZ. Potential for localised changes in bat activity.	Long term	Low	Site		Site (Adverse)
Otter	Site	Temporary disturbance during ship movements at high tide	Long term	Negligible	Negligible		Negligible (Adverse)
Breeding birds	Site	Potential for reduction in nesting bird activity in adjoining habitats due to operational noise, lighting, loading and unloading at the dock.	Long term	Low	Negligible		Negligible (Adverse)
Wintering birds	Site	Potential changes in wintering bird activity in the open water dock due to operational noise, lighting, loading and unloading activities.	Long term	Low	Site		Site (Adverse)
Reptiles	Local	Changes in value of the reptile temporary mitigatioin area prior to translocation to permanent receptor site, Indirect disturbance of populations in habitats adjoining the PDZ and Phoenix Wharf.	Long term	Negligible	Negligible		No change
Invertebrates	Local	Potential for invertebrates to be attracted into the site from the surrounding unlit area with the potential to affect local populations.	Long term	Low	Site	Controls on lighting at night	Site (Adverse)

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Legend

Application Boundary

Rev	Description	By	CB	Date

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20 Western Avenue, Milton Park, Abingdon, Oxfordshire, OX14 4SH
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Client: LanzaTech UK Limited

Project: Project Dragon SAF Production Facility

Title: Development Areas

Status	Drawn By	PM/Checked By
ISSUE	OW	TO
Project Number	**Scale @ A3**	**Date Created**
ECO02340	1:4,000	AUG 2023
Figure Number		**Rev**
1		-

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Legend

- Application Boundary
- Bare Ground/Sparsely Vegetated Ground
- Rubble
- Bracken
- Bramble Scrub
- Bramble Scrub and Japanese Knotweed
- Broadleaved Woodland
- Scrub Woodland (Grey Willow)
- Buildings
- Dune Slack Vegetation
- Dense Scrub
- Ephemeral Vegetation
- Gorse Scrub
- Hardstanding
- Ivy/Bramble/Scattered Scrub
- Japanese Knotweed
- Line of trees - Broadleaved
- Mature Conifer Tree Line
- Naturally Regenerating Grassland
- Naturally Regenerated Grassland (Semi-improved)
- Non-Ruderal (Ivy and Ferns)
- Non-native - invasive species
- Reedbed
- Scattered Scrub
- Scattered Trees
- Standing Water
- Open Water
- Scattered scrub
- Scattered tree - broadleaved
- Security Fence

Rev	Description	By	CB	Date

MAKING COMPLEX EASY

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Project: Project Dragon SAF Production Facility

Title: Habitat Plan

Status	Drawn By	PM/Checked By
DRAFT	HM	TO
Project Number	**Scale @ A3**	**Date Created**
ECO02340	1:3,000	AUG 2023
Figure Number		**Rev**
4		-

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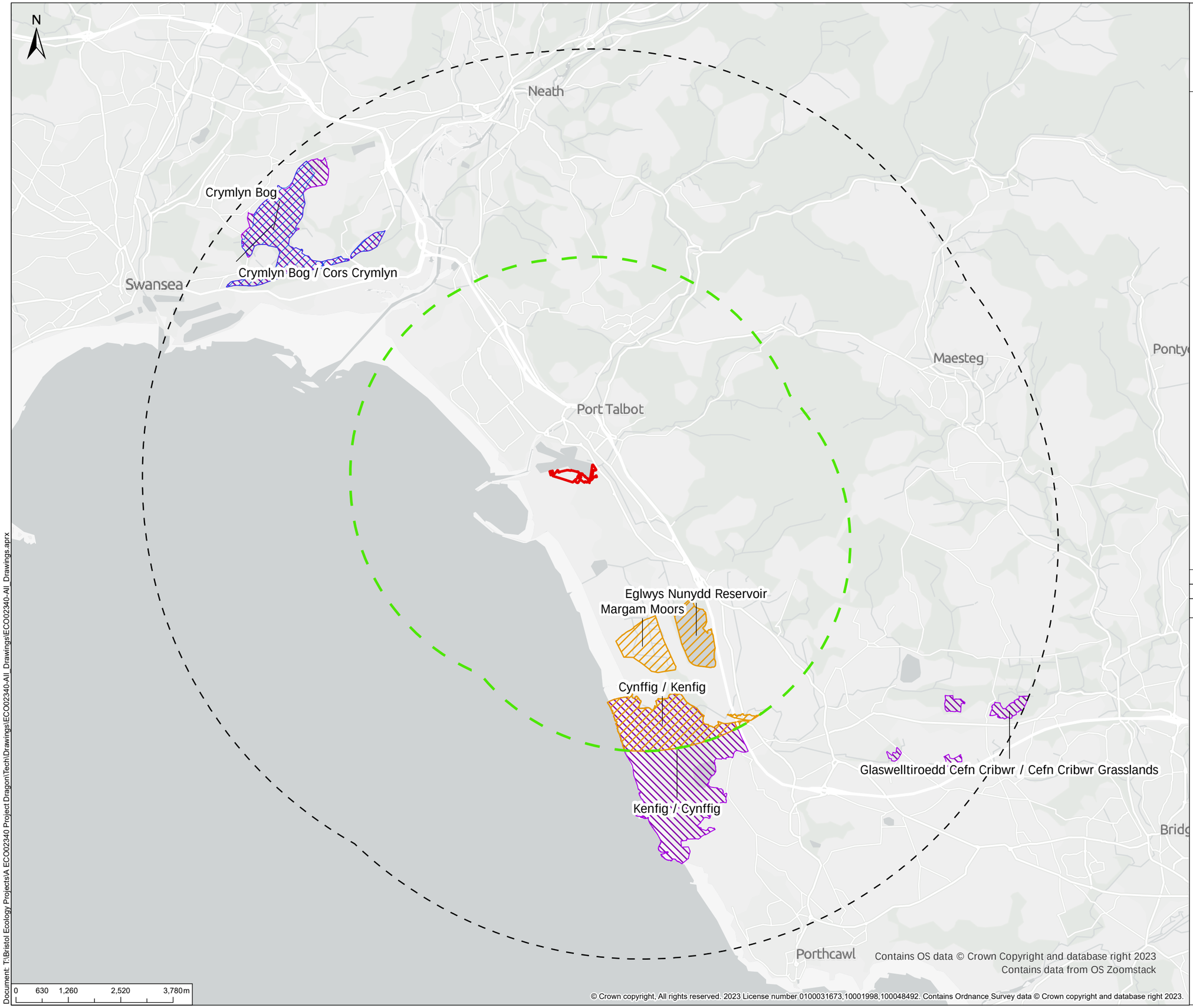

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Legend

- Application Boundary
- ECO02340 EIA Study 10km Buffer
- ECO02340 EIA Study 5km Buffer
- SSSI
- RAMSAR
- SAC

Rev	Description	By	CB	Date

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Client: LanzaTech UK Limited

Project: Project Dragon SAF Production Facility

Title: Statutory designations plan within 10km and 5km radius Project Dragon

Status	Drawn By	PM/Checked By
Draft	OW	

Project Number	Scale @ A3	Date Created
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Figure Number	Rev
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Legend

- Application Boundary
- Ancient Semi Natural Woodland
- Ancient Woodland Site of Unknown Category
- NRW Priority Area (Woodland - PAWS)
- Plantation on Ancient Woodland Site
- Restored Ancient Woodland Site
- NRW Priority Area (Lowland Wetland)
- Wildlife Site / SINC (Adopted)

Rev	Description	By	CB	Date

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Client: LanzaTech UK Limited

Project: Project Dragon SAF Production Facility

Title: Non-Statutory designations plan within 2km radius Project Dragon

Status	Drawn By	PM/Checked By
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Figure Number		**Rev**
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Site Boundaries

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Project: Project Dragon

Title: Harbourside Areas Plan

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ANNEXES

Annex A

Preliminary Ecological Appraisal

PRELIMINARY ECOLOGICAL APPRAISAL

Project Dragon, Port Talbot

ECO02340
Preliminary Ecological Appraisal
1
July 2022

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Quality Management

Version	Status	Authored by	Reviewed by	Approved by	Review date
1	Draft for client review	Charles Jennings Tim Oliver	Nick Betson	Tim Oliver	July 2022

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1 INTRODUCTION

1.1 Purpose and scope of this report

1.1.1 RPS was commissioned by LanzaTech to prepare a Preliminary Ecological Appraisal of the EIA Study Area Boundary within the Port Talbot, referred to in this report as the site.

1.1.2 The preliminary ecological appraisal comprises a desk study, Phase 1 Habitat Survey, and a preliminary protected species assessment (CIEEM, 2017) and the results are presented in this Preliminary Ecological Appraisal Report (PEAR).

1.1.3 This assessment is considered 'preliminary'. For any planning application the findings of the PEA would be combined with relevant further surveys (such as protected species, supplemental habitat assessment or invasive species surveys) and incorporated into a final Ecological Appraisal or Ecological Impact Assessment (EcIA) which would assess the effects of the development and present the mitigation measures that have been incorporated into the development proposal.

1.1.4 The PEA aims to:

- undertake a desk-based review of designated sites and records of protected species and other species that could present a constraint on development;
- review aerial imagery to assess the site in relation to its context in the wider landscape.
- map and assess the habitats present on site;
- assess the site's potential to support legally protected species, species of conservation concern and species of principal importance.
- review implications for future development proposals

1.1.5 All future development proposals within the EIA Study Area Boundary will be supported by a detailed Ecological Impact Assessment (EcIA) and terrestrial ecology chapter of an Environmental Statement (ES). These assessments and mitigation design would be derived using the baseline habitat information presented in this report and the results of Phase 2 survey findings in the context of the detailed development proposals. These reports will assess the effects of the development and present the mitigation and compensation measures that have been incorporated into the development proposals.

1.1.6 Reference is made to the need for mitigation / compensation measures, where relevant, but no details are proposed in relation to these which falls outside the scope of this report.

1.1.7 Assessment of the marine habitats associated with the open water dock fall outside the scope of this report.

1.2 Study Area Location and Context

1.2.1 The Project Dragon site is located within the Port Talbot Docks landholding bounded by the Port Talbot Steelworks to the south and by the open water docks to the north.

1.2.2 For the purposes of the PEA, the survey area been subdivided into four sections based on their relationship to the development proposals. These comprise the main development site; hereafter referred to as the Production Development Zone (PDZ), Temporary Construction Areas 1 and 2; and the Marine Unloading/Loading Facility on the side of the open water dock (referred to in this report as Crown Wharf berth).

1.2.3 The survey areas are defined on Figure 1.

1.2.4 Phoenix Way adjoins the northern boundary of the PDZ. The disused railway sidings at the western end of the Llanwern Iron Ore Branch Railway bounds the PDZ to the south.

1.2.5 The estuarine section of the River Afan lies to the north of the where it flows into Swansea Bay beyond a harbour wall and breakwaters. An enclosed harbour with shallow sloping stony / rocky foreshore lies to the west of the site. The median high-water line is approximately 30m from the boundary at the closest point with a strip of open grassland between the foreshore and Phoenix Way. This strip is typically 30 to 60m wide but narrows to 5m in one section.

1.2.6 Tata steelworks operational areas lie to the south and west of the Llanwern Iron Ore Branch Railway.

1.3 Legislation, policy and guidance

1.2.7 Relevant legislation, policy guidance and both Local and National Biodiversity Action Plans (BAPs) are referred to in this report where appropriate.

1.3.1 The relevant articles of legislation are:

- Planning Policy Wales: Technical Advice 5: Nature Conservation and Planning;
- The Conservation of Habitats and Species Regulations 2017;
- The Environment (Wales) Act 2016;
- The Wildlife and Countryside Act 1981 (as amended);
- The Protection of Badgers Act 1992;
- Well-being of Future Generations (Wales) Act 2015;
- Natural Environment and Rural Communities Act 2006;
- The Countryside and Rights of Way Act 2000;
- The Action Plan for Pollinators in Wales; and

1.3.2 A summary of legislation relevant to protected or other species identified as potential constraints in this report is provided in Appendix A.

2 METHODS

2.1 Habitat Survey

2.1.1 The Phase 1 Habitat surveys of the survey area were carried out in June and July 2021 and in July and August 2022 by Tim Oliver, an experienced ecologist supported by Charles Jennings. The Phase 1 Habitat survey broadly followed the standard methodology (JNCC, 2016), and as described in the Guidelines for Preliminary Ecological Assessment (CIEEM, 2017).

2.1.2 During the survey visits, an assessment was made of each of the habitats within the survey area. The habitats mapped and described in terms of its botanical species composition. Habitats were classified according to their composition and structure. This broadly followed Phase 1 Habitat types but included non-standard classifications for grasslands to provide distinction between the different plant communities establishing on the post-industrial land.

2.1.3 The extent of habitats was defined using a combination of aerial photography and mapping during the walkover survey. The structure and composition of habitats with restricted access were assessed from the margins.

2.1.4 The site was assessed for its suitability to support protected species, in particular great crested newt *Triturus cristatus*, reptile species, birds, badger *Meles meles*, bats, and other species of conservation importance that could pose a constraint that would need to be addressed in the planning application.

2.1.5 During each of the walkover survey visits, searches were made for evidence of use of the different parts by faunal species. Any signs were noted including burrows, droppings, footprints, paths, hairs, and potential refugia. Areas of bare earth were inspected for mammal prints. Additional notes on habitats and features of value to fauna were made during Phase 2 species.

2.1.6 The areas of habitat considered suitable for protected species or those of conservation interest were recorded.

2.2 Botanical Survey

2.2.1 Botanical surveys were undertaken for grassland and species diverse ephemeral habitats in July 2022 in the Production Development Zone and Temporary Construction Area 1. Detailed plant species were compiled for the main habitat types and each species was assigned a frequency within the relevant habitat (dominant, abundant, frequent, occasional, rare and local).

2.2.2 In the Production Development Zone, plant species lists were compiled for the open regenerating grassland and more established areas of neutral grassland.

2.2.3 A plant species list was compiled for the extensive ephemeral and regenerating grassland in Temporary Construction Area 1.

Constraints

2.2.4 In the PDZ there was very limited open access through the scrub woodland and extensive Japanese knotweed stands. In 2021 the surveyor avoided walking into stands of Japanese knotweed to minimise the potential for plant fragments to be moved on clothing or footwear. All surveyors followed biosecurity security measures ensuring no Japanese knotweed plant material or substrate was inadvertently transported outside the areas of infestation.

2.2.5 Following the cutting down on the dead stems of Japanese knotweed across the most extensive stands and bramble, all areas of grassland become accessible during the surveys in spring and summer 2022.

2.2.6 In Temporary Construction Area 2 the dense structure of the scrub woodland and extensive thickets of dense bramble, bracken and Japanese knotweed prevented access through some of the habitats within this area. The boundary of Temporary Construction Area 2 overlaps an extensive reedbed which was not accessed for health and safety. Access through the land at Crown Wharf Berth was restricted to localised areas of more open vegetation with dense stands of bramble and bracken and dense shrub willow growing on the side of the dock.

Survey Data

2.2.7 It should be noted that whilst every effort has been made to provide a comprehensive description of the site, no investigation can ensure the complete characterisation and prediction of the natural environment.

2.2.8 The protected/notable species assessment provides a preliminary view of the likelihood of these species occurring on the site, based on the suitability of the habitat, known distribution of the species in the local area provided in response to our enquiries and any direct evidence on the site. It should not be taken as providing a full and definitive survey of any protected/notable species group.

Accurate Lifespan of Ecological Data

2.2.9 The majority of ecological data remain valid for only short periods due to the inherently transient nature of the subject. The survey results contained in this report are considered accurate for two years, assuming no significant considerable changes to the site conditions.

3 RESULTS

3.1 Designated Sites

Statutory Designated Sites

3.1.1 There are no international statutory designated sites within 5km of the site boundary and no national statutory designated sites within 2km of the site (excluding the Llanwern Iron Ore Branch Railway).

3.1.2 The closest internationally protected sites are Kenfig SSSI/NNR/SAC (5km to the south of the Llanwern Iron Ore Branch Railway) and Crymlyn Bog and Pant y Sais SSSI/NNR/SAC (6.6km to the north of Crown Wharf Berth).

3.1.3 The closest statutory designated sites to the Production Development Zone are Margam Moor SSSI (3.5km) and Eglwys Nunydd Reservoir (3.6km), both located to the south.

Non-statutory Sites

3.1.4 Five non-statutory Sites of Interest to Nature Conservation (SINC) are located within 2km of the EIA Study Area (excluding the Llanwern Iron Ore Branch Railway).

3.1.5 Harbourside Law Courts SINC is a 3.04ha brownfield site supporting Open Mosaic Habitats on Previously Developed Land located 800m to north-east of the production development Zone. The open habitat mosaic consists of large areas of stonecrop species *Sedum*, kidney vetch *Anthyllis vulneraria*, and bare ground. Plant species listed on the citation include common centaury *Centaurium erythraea*, yellow-wort *Blackstonia perfoliata* and other early pioneer species. Invertebrate populations include small blue butterfly *Cupido minimus*, shrill carder bee *Bombus sylvarum*, and brown-banded carder bee *Bombus humilis*. Slow worm *Anguis fragilis*, linnet *Carduelis cannabina* and starling *Sturnus vulgaris* have also been recorded.

3.1.6 The boundary of the Lower River Afan Estuary SINC is 6.63ha comprising coastal saltmarsh and intertidal mudflats located 1km west of production development Zone. These habitats and the population of sea stock *Matthiola sinuate* are the primary reasons for designation.

3.1.7 The Lower River Afan Estuary SINC is described as supporting an excellent mosaic of saltmarsh plants along a strip between mudflats and coastal grassland which includes pockets of dune habitat along the higher shore adjoining the Little Warren SINC.

3.1.8 Little Warren SINC lies on the opposite side of the mouth of the river 1.2km west of the production development Zone at the closest point. The SINC is 1.47ha and is designated for its coastal sand-dunes with associated slacks, seepages, grassland, and scrub habitat along with an important population of sea stock. The SINC lie adjacent to housing development with connectivity to Lower River Afan SINC and the Baglan Bay dune system SINC to the north.

3.1.9 NPT Watercourses SINC is an extensive designation covering watercourses and waterways across the county borough covering coastal, urban and industrial areas including those around the steelworks and docks. The River Afan forms part of this SINC site and the SINC boundary is approximately 700m to the west of production development Zone at the closest point.

3.1.10 Bryn Goytre Cycleway SINC is a 2.5 mile linear section of disused railway line and currently a designated cycle track which follows the Cwm Dyffryn Valley between Bryn and Goytre. Near Bryn and Goytre there are verges of low diversity mesotrophic grassland (largely MG1), but much of the track is flanked by ancient Sessile-oak/Birch woodland with abundant ferns plus a suite of Ancient

Woodland Indicators. The cycleway is approximately 1.4km north-east of the Production Development Zone.

Other designations

B-Lines

3.1.11 The steelworks and associated docks form part of a regional 'B-Line' network which is a national initiative led by Buglife for pollinators and wider biodiversity.

3.1.12 The B-Lines in Neath Port Talbot and in and around Swansea have been identified by Buglife Cymru working in partnership with local organisations including both planning authorities. Around Port Talbot the B-Lines cover coastal, urban, and industrial land and form wide network of corridors with the objective of facilitating projects that restore, enhance and create wildflower-rich habitat for pollinators as stepping stones along the corridors.

Ancient woodland

3.1.13 A small block of ancient woodland lies 1.25km to east of the PDZ to the south-western side of the M4 motorway.

3.2 Species Records

3.2.1 A number of species of conservation importance or otherwise notable have been recorded within the 2 km search radius of the site in the past. A summary of these records are listed in Table 3.1. Species of local importance recorded within the site or wider docks are also included on the table. Records of seabirds have been omitted.

Table 3.1: Species records from within 2 km of the site

Scientific Name	Common Name	Status*	Nearest distance from site (m)
Bats			
Common pipistrelle	*Pipistrellus pipistrellus*	WCA5, S7, UKBAP	Recorded within wider docks
Soprano pipistrelle	*Pipistrellus pygmaeus*	WCA5, S7, UKBAP	Recorded within wider docks
Greater horseshoe bat	*Rhinolophus ferrumequinum*	WCA5, S7, UKBAP	2.5km
Lesser horseshoe bat	*Rhinolophus hipposideros*	WCA5, S7, UKBAP	2.7km
Myotis species	*Myotis sp.*	WCA5, S7, UKBAP	1.5km
Brown long eared bat	*Plecotus auratus*	WCA5, S7, UKBAP	874m
Noctule	*Nyctalus noctula*	WCA5, S7, UKBAP	200m
Other Mammals			
Otter	*Lutra lutra*	WCA5, S7, UKBAP	918m
Badger	*Meles meles*	PBA	625m
Hazel dormouse	*Muscardinus avellanarius*	WCA5, S7, UKBAP	1.9km
Brown hare	*Lepus europaeus*	S7, UKBAP	198m from site
Polecat	*Mustela putorius*	S7, UKBAP	1.4km from site
Western European hedgehog	*Erinaceus europaeus*	S7, UKBAP	320m from site
Birds			
Whitethroat	*Curruca communis*	WBR(RSPB), UKBAm (RSPB),	Recorded on site (PDZ)
Gadwall	*Anas strepera*	S7, UKBAm (RSPB),	Recorded within wider docks

Skylark	*Alauda arvensis*	S7, WBAm (RSPB), UKBR (RSPB),	Recorded within wider docks
Little Ringed Plover	*Charadrius dubius*	WCA1.1	Recorded within wider docks
Ringed Plover	*Charadrius hiaticula*	WCA1.1, S7, WBAm (RSPB), UKBAm (RSPB),	Recorded within wider docks
Reed Bunting	*Emberiza schoeniclus*	S7, WBAm (RSPB), UKBAm (RSPB),	Recorded on site (PDZ)
Linnet	*Linaria cannabina*	S7, WBR (RSPB), UKBR(RSPB),	Recorded within wider docks
Hedge Accentor	*Prunella modularis*	S7, UKBAm (RSPB), UKBAP	Recorded on site (TCA2)
Song thrush	*Turdus philomelos*	S7, UKBAm (RSPB), UKBAm (RSPB)	Recorded within wider docks
House sparrow	*Passer domesticus*	S7, WBAM(RSPB), UKBR (RSPB), UKBAP	Recorded within wider docks
Northern Lapwing	*Vanellus vanellus*	S7, WBR(RSPB), UKBR(RSPB), UKBAP	Recorded within the docks
Woodcock	*Scolopax rusticola*	WBR(RSPB), UKBR(RSPB),	Recorded within the docks
Yellow wagtail	*Motacilla flava*	S7, WBR(RSPB), UKBR(RSPB),	Recorded within the docks
Meadow pipit	*Anthus pratensis*	WBAm (RSPB), UKBAm (RSPB),	Recorded within the docks
Grey wagtail	*Motacilla cinerea*	WBAm (RSPB), UKBAm (RSPB),	Recorded within the docks
Grey heron	*Ardea cinerea*	WBAm (RSPB)	Recorded within the docks
Sand martin	*Riparia riparia*		Recorded within the docks
Starling	*Sturnus vulgaris*	S7, WBR(RSPB), UKBR (RSPB),	Recorded within the docks
Kestrel	*Falco tinnunculus*	S7, WBR(RSPB), UKBAM (RSPB),	Recorded on-site (TCA1)
Cetti's warbler	*Cettia cetti*	WCA1.1	Recorded on site (TCA2)
Mallard	*Anas platyrhynchos*	WBAM(RSPB), UKBAM (RSPB),	Recorded in open water dock
Wigeon	*Anas penelope*	WBAM(RSPB), UKBAM (RSPB),	Recorded in open water dock
Common gull	*Larus canus*	WBR(RSPB), UKBAM (RSPB),	Recorded in open water dock
Black-headed gull	*Chroicocephalus ridibundus*	S7, WBR(RSPB), UKBAM (RSPB),	Recorded in open water dock
Herring gull	*Larus argentatus*	S7, WBR(RSPB), UKBR(RSPB),	Recorded in open water dock
Lesser black backed gull	*Larus fuscus*	WBAm (RSPB), UKBAm (RSPB)	Recorded in open water dock
Great black backed gull	*Larus marinus*	WBR(RSPB), UKBAM (RSPB),	Recorded in open water dock
Oystercatcher	*Haematopus ostralegus*	WBAm (RSPB), UKBAm (RSPB)	Recorded in open water dock
Coot	*Fulica atra*	WBAM (RSPB)	Recorded in open water dock
Pochard	*Aythya ferina*	WBR(RSPB), UKBR(RSPB),	Recorded in open water dock
Teal	*Anas crecca*	WBAm (RSPB), UKBAm (RSPB)	Recorded in open water dock
Tufted dock,	*Aythya fuligula*		Recorded in open water dock
Cormorant	*Phalacrocorax carbo*	WBAM (RSPB)	Recorded in open water dock
Little gull	*Larus minutus*	WBAM (RSPB)	Recorded in open water dock
Kingfisher	*Alcedo atthis*	WCA1.1, WBAm (RSPB), UKBAm (RSPB)	Recorded in lower River Afan
Turnstone	*Arenaria interpres*	WBAM (RSPB),	Recorded in lower River Afan
Redshank	*Tringa totanus*	WBAM (RSPB), UKBR (RSPB),	Recorded in lower River Afan
Curlew	*Numenius arquata*	S7, WBR(RSPB), UKBR(RSPB),	Recorded in lower River Afan
Mediterranean gull	*Larus melanocephalus*	UKBAm (RSPB),	Recorded in lower River Afan
Common sandpiper	*Arctitis hypoleucos*	WBR (RSPB), UKBAm (RSPB),	Recorded in lower River Afan
Reptiles			
Grass Snake	Natrix natrix	WCA5, S7, UKBAP,	Recorded within wider docks
Slow worm	Anguis fragilis	WCA5, S7, UKBAP,	684m

Adder	Vipera vipera	WCA5, S7, UKBAP	1.6km
Common Lizard	Zootoca vivipara	WCA5, S7, UKBAP	Recorded on site (PDZ)
Amphibians			
Great crested newt	Triturus cristatus	WCA5, S7, UKBAP	1.2km from site boundary (within steelworks)
Common Toad	*Bufo bufo*	S7, UKBAP	Recorded within wider docks
Invertebrates			
Brown banded carder bee	*Bombus humilis*	S7, UKBAP	Recorded on site (PDZ)
Shrill Carder Bee	*Bombus sylvarum*	S7, UKBAP	Over 1km
Small Blue	*Cupido minimus*	S7, UKBAP	Recorded on site (PDZ)
Dingy Skipper	*Erynnis tages*	S7, UKBAP	490m from site
Wall	*Lasiommata megera*	S7, UKBAP	Recorded on site (PDZ)
Cinnabar moth	*Tyria jacobaeae*	S7, UKBAP	Recorded on site (PDZ)
Red tailed bumblebee	*Bombus lapidarius*		Recorded on site (PDZ)
Common carder bee	*Bombus pascuorum*		Disused railway line
Latticed heath	*Chiasmia clathrata*	S7, UKBAP	Disused railway line
Small heath	*Coenonympha pamphilus*	S7, UKBAP	Recorded within wider docks
Flora			
Oxtongue broomrape	*Orabanche picridis*	WCA8	Recorded within wider docks
Sea Stock	*Matthiola sinuata*	S7, UKBAP, RD (UK)	230m from site
Basil thyme	*Clinopodium acinos*	S7, UKBAP,	Recorded within wider docks
Pink water speedwell	*Veronica catenata*	Locally important	Recorded on site (PDZ)
Hawkweed oxtongue	*Picris hieracioides*	Locally important	Recorded on site (PDZ)
Yellow wort	*Blackstonia perfoliata*	Locally important	Recorded on site (PDZ)
Common broomrape	*Orobanche minor*	Locally important	Recorded on site (PDZ)
Eyebright species	*Euphrasia sp*	Locally important	Recorded on site (PDZ)
Basil thyme	*Clinopodium acinos*	Locally important	Recorded within wider docks
Pyramidal orchid	*Anacamptis pyramidalis*	Locally important	Recorded within wider docks
Viper's bugloss	*Echium vulgare*	Locally important	Recorded within wider docks
Perennial wall rocket	*Diplotaxis tenulifolia*	Locally important	Recorded within wider docks
Pale toadflax	*Linaria repens*	Locally important	Recorded within wider docks
Common broomrape	*Orobanche minor*	Locally important	Recorded within wider docks
Bee orchid	*Ophrys apifera*	Locally important	Recorded within wider docks
Sand cat's-tail	*Phleum arenarium*	Locally important	Recorded within wider docks
Wild mignonette	*Reseda lutea*	Locally important	Recorded within wider docks
Grey club-rush	*Schoenoplectus tabernaemontani*	Locally important	Recorded within wider docks
Rough clover	*Trifolium scabrum*	Locally important	Recorded within wider docks
Frog rush	*Juncus ranarius,*	Locally important	Recorded within wider docks
Knotted pearlwort	*Sagina nodosa,*	Locally important	Recorded within wider docks
Long-bracted sedge	*Carex extensa*	Locally important	Recorded within wider docks
Sea holly	*Eryngium maritimum.*	Locally important	Recorded within wider docks
Sand couch	Elytrigia juncea,	Locally important	Recorded within wider docks
Sea rocket	*Cakile maritima*	Locally important	Recorded within wider docks
Sea bindweed	*Calystegia soldanella.*	Locally important	Recorded within wider docks
Hoary ragwort	*Jacobaea erucifollia*	Locally important	Recorded on disused railway line

Great plait moss	*Hypnum cupressiforme var. lacunosum*	Locally important	Recorded on disused railway line
Nicholsons beard-moss	*Didymodon nicholsonii*	Locally important	Recorded on disused railway line

*Abbreviations used: WCA1: Wildlife and Countryside Act Schedule; WCA1.1: Wildlife and Countryside Act Schedule 1, part 1; WCA5: Wildlife and Countryside Act Schedule 5; WCA8: Wildlife and Countryside Act Schedule 5; S7: Environment (Wales) Act 2016, Section 7 species; WBR (RSPB): RSPB – Wales' Red Bird List; WBAm (RSPB): RSPB – Wales' Amber Bird List; UKBR(RSPB): RSPB – UK Red Bird List; UKBAm (RSPB): RSPB – UK Amber Bird List; UKBAP: UK Biodiversity Action Plan, listed species; The Vascular Plant Red Data List (UK), listed species.

3.3 Habitats - Overview

3.3.1 Across the survey area as a whole the principal habitat types are listed below with the different habitats present in each part of the survey area are described below.

- Scrub woodland dominated by shrub willow
- Japanese knotweed stands
- Naturally regenerated grassland (open and more established)
- Ephemeral vegetation – mixed species*
- Sparsely vegetated ephemeral vegetation / bare ground
- Scrub woodland dominated by shrub willow
- Bracken
- Bramble (thicket)
- Dense scrub
- Non-native scrub (primarily butterfly bush and sea buckthorn)
- Bare ground (unsealed and sealed surface)
- Reedbed (seasonally dry)

3.3.2 Photographs of the habitat types and areas are presented in Appendix C for the Production Development Zone and Appendix D for the Temporary Construction Areas.

3.4 Production Development Zone

Overview

3.4.1 The Production Development Zone is an extensive area of previously developed/disturbed ground that has naturally regenerated over the last 20 years to form a mosaic of regenerating scrub woodland (dominated by shrub willows), with very extensive stands of Japanese knotweed *Reynoutria japonica*. Naturally regenerated grassland, along with bracken *Pteridium aquilinum*, gorse *Ulex europaeus* scrub and bramble *Rubus fruticosus* agg., are more localised in extent. Three small low-lying areas supporting stands of common reed *Phragmites australis* are partially enclosed by scrub and Japanese knotweed.

3.4.2 The Phoenix Way road runs along the northern boundary. A steep bank up to the disused railway line/sidings lies beyond the southern boundary.

3.4.3 Operational industrial sites comprising buildings and hardstanding and the access roads are located to the east. An extensive reedbed (>1ha in extent) lies between the industrial operations. The railway embankment up to the disused railway sidings forms the southern boundary.

3.4.4 Photographs of the range of habitats present in the Production Development Zone are presented in Appendix B.

Scrub Woodland

3.4.5 Regenerating scrub woodland dominated by shrub willows is the most extensive habitat within the Production Development Zone and is now approximately 30% of the vegetation cover. The shrub willows are all multi-stemmed and form a continuous 8-10m high canopy across the habitat (Plate 1). Other shrub species occur rarely, most notably silver birch *Betula pendula*. Goat willow *Salix caprea* is occasional and downy birch *Betula pubescens* occurs rarely. The non-native butterfly bush *Buddleija davidii* is present in the edge habitat but largely absent from within the scrub.

3.4.6 The ground flora below the young woodland is patchy has low species diversity. Dewberry *Rubus caesius* is abundant throughout (Plates 2 and 3), sometimes dominant and only locally replaced by bramble.

3.4.7 Other ground flora species occur a low frequency reflecting the adjacent habitats. A range of grasses and sedges were noted including Yorkshire fog *Holcus lanatus*, creeping bent *Agrostis stolonifera*, rough meadow-grass *Poa trivialis*, false oat-grass Arrhenatherum elatius, *hairy sedge Carex hirta*, spiked sedge *Carex spicata*, sand sedge *Carex arenaria* and common reed *Phragmites australis* were all recorded.

3.4.8 A few shade tolerant ruderals (willowherb species, field horsetail *Equisetum arvense* and cleavers *Galium aparine*) occur alongside woodland species (male fern *Dryopteris filix-mas*, herb Robert *Geranium robertianum*). In places the ground flora is very sparse where there is negligible soil cover on the underlying made ground.

3.4.9 Much of the willow habitat has established over the last 20 years. In 2008, the aerial photography indicates that young scrub was scattered scrub with only small areas of more mature larger shrub willows. At this time shrubs covered less than 5% of the Production Development Zone area.

Invasive Non-native Species

3.4.10 Stands of Japanese knotweed currently cover approximately 40% of the Production Development Zone, with many being long established. The largest expanses are in the south-western quarter, but areas with dense old growth are distributed widely throughout (Plates 4 and 5). In many places, dense Japanese knotweed also grows within willow scrub woodland (Plate 6). Young growth was noted around the edges of most stands of Japanese knotweed and individual young plants were noted growing in the woodland and grassland a significant distance from other growth.

3.4.11 Montbretia *Montbretia Crocosmia x crocosmiiflora* occurs in a few locations in the central part of the Production Development Zone. Wall cotoneaster *Cotoneaster horizontalis* was recorded on the railway embankment on the southern boundary.

Naturally Regenerated Grassland

3.4.12 There are several areas of naturally regenerated grassland in Production Development Zone, the largest of which is a linear east-west strip in the south-eastern section half of site which extends north-south parallel to the eastern boundary. A further linear area of grassland adjoins the Phoenix Way on the northern boundary.

3.4.13 Further areas of grassland enclosed by scrub woodland in the western half of the site and at the base of the railway embankment on the southern boundary. These areas vary in size but typically form ‘glades’ bounded by dense scrub willow, continuous stands of Japanese knotweed and thickets of bramble.

3.4.14 The composition and structure of the different areas of grassland are described below. The botanical species assemblage for grassland habitat is presented in Appendix B.

Eastern Grassland

3.4.15 In the eastern part of Production Development Zone, a linear area of grassland approximately 15m across and 180m in length is bounded on both sides by areas of dense willow scrub and Japanese knotweed and gorse (Plate 7).

3.4.16 The grassland has over 80% cover of herbs and grasses with minimal bare ground. The sward height is generally low due to rabbit grazing. The grassland structure is relatively open with coarse grasses only occurring occasionally.

3.4.17 The overall species assemblage is moderately diverse with some variation. Dewberry is locally abundant with the constant associate species of hairy sedge, Yorkshire fog, common restharrow *Ononis repens* and ribwort plantain *Plantago lanceolata*. Locally frequent species include bird's-foot trefoil *Lotus corniculatus*, thyme-leaved sandwort *Arenaria serpyllifolia,* Canadian fleabane *Erigeron canadensis*, red fescue *Festua rubra*, black medick *Medicago lupilina* and ribbed melilot *Melilotus officinalis*. In places the substrate is sandy which is reflected in the species composition. With sand sedge *Carex arenaria*, creeping willow *Salix repens* var. *argentea*, and tufted vetch *Vicia cracca* frequent in these areas.

3.4.18 Species that are widespread but occur at lower frequency include perforate St Johns wort *Hypericum perforatum*, yarrow *Achillea millefolium*, agrimony *Agrimonia eupatoria*, evening primrose *Oenanthe* sp., meadow vetchling *Lathyrus pratensis*, heath bedstraw Galium saxatile, common storks-bill *Erodium cicutarium*, wild strawberry *Fragaria vesca*, and common knapweed *Centaurea nigra*.

3.4.19 On the margins, adjoining the dense scrub, the grassland is more coarse with false oat-grass locally frequent along with common tall ruderal species. Montbretia, an invasive non-native plant has also established in the scrub-edge grassland.

3.4.20 The grassland on the north-eastern boundary of the Production Development Zone supports a species composition (Plates 8 and 9). Additional species including creeping cinquefoil *Potentilla reptans*, red bartsia *Odontites vernus*, yellow-wort *Blackstonia perfoliata*, selfheal *Prunella vulgaris*, pyramidal orchid *Anacamptis pyramidalis*, marsh orchid *Dactylorrhiza* sp, common broomrape *Orabanche minor*, fern grass *Catapodium rigidum*, sheep's sorrel *Rumex acetosella*, white clover *Trifolium repens*, thistles *Cirsium* sp., hard rush *Juncus inflexus*, common fleabane *Pulicaria dysentrica*, an eyebright *Euphrasia* species, vervain *Verbena officinalis*, common centaury *Centaurium erythraea*, and wild parsnip *Pastinacea sativa*. Hawkweed oxtongue *Picris hieracioides* is occasional and a single spike of oxtongue broomrape was recorded in late June 2022.

3.4.21 Several ruderal species were present: spear thistle *Cirsium vulgare*, creeping thistle *Cirsium arvense*, hoary mustard *Hirschfeldia incana* and hogweed *Heracleum sphondylium*. Willow and butterfly bush saplings are also colonising into the grassland with the area adjoining woodland and scrub.

Northern boundary grassland

3.4.22 The grassland habitat on the north-western boundary of the Production Development Zone, adjoins Phoenix Way. It has a taller sward and a higher proportion of coarse grasses and bramble patches are establishing. Overall the habitat retains a diversity of wildflowers but with most species only occurring occasionally or rarely (Plate 10).

3.4.23 At the eastern end, the substrate is sandier and the shorter sward is heavily grazed by rabbits. The most frequent species were common restharrow, creeping cinquefoil, and Canadian fleabane (Plate 11).

Grassland 'Glades'

3.4.24 Grassland areas in the centre of the Production Development Zone are enclosed by the scrub woodland and bramble. They are characterised by frequent / locally abundant dewberry which forms a low sprawling growth habitat and creates a more closed grassland structure with patches of reed (Plate 12).

3.4.25 Yorkshire fog and creeping bent were the most abundant grass species with false oat-grass and cock's-foot *Dactylis glomerata*. There is variation in the structure across this grassland type with some areas having low species diversity. Creeping cinquefoil is frequent throughout with both greater bird's-foot trefoil *Lotus pedunculatus* and hedge bedstraw locally abundant (Plate 13). The more diverse areas of grassland areas supported populations of yarrow, creeping willow, evening primrose, wild parsnip, common vetch V*icia sativa*, and greater knapweed *Centaurea scabiosa*.

3.4.26 The presence of greater bird's-foot trefoil, common figwort *Scrophularia nodosa*, creeping buttercup *Ranunculus repens*, meadow vetchling and square-stemmed St john's wort *Hypericum tetrapterum* indicate that the ground is seasonally damp. Shrubs, bramble and Japanese knotweed are encroaching into the grassland in many locations (Plate 14 and 15).

3.4.27 Smaller grassland 'glades' occur on the southern boundary, between the railway embankment and scrub woodland (Plate 16). These areas are characterised by abundant hairy sedge and low open growth of dewberry, which together dominant the composition. The species diversity is low to moderate. Creeping cinquefoil ss frequent with occasional sand sedge, glaucous sedge *Carex flacca*, eyebright, agrimony, meadow vetchling, tansy, common fleabane, square-stemmed St John's wort, common knapweed and selfheal.

3.4.28 Southern marsh orchids and greater bird's-foot trefoil were both locally occasional. Hard rush was noted in dried out areas of winter pooling. Small but established stands of Japanese knotweed are growing into these grassland areas.

Dune Slack Vegetation

3.4.29 A very small, partially shaded, area of regenerating vegetation in the centre of the site is characterised by creeping willow, water mint *Mentha aquatica*, dotted sedge *Carex punctata* and glaucous sedge with sharp rush *Juncus acutus* and sea rush *Juncus maritimus* (Plate 17). Other species occurring at low frequency included creeping bent, lesser spearwort, dewberry, eyebright species, bird's-foot trefoil, and selfheal.

3.4.30 This habitat has developed on ground that is subject to extended periods of waterlogging each winter and the assemblage of species is typical of areas of seasonally flooding in sand dunes or other coastal habitats.

Seasonally flooded ground

3.4.31 Small stands of common reed occur in the three low-lying areas, each bounded by dense shrub willows with patches of Japanese knotweed (Plate 18). They are all seasonally flooded during winter, drying up in in summer and primarily support common reedbed occupying c0.09ha. Where reed growth is less dense, a small number of bryophyte species create a dense carpet below the common reed. Other aquatic plants include sea club rush *Bolboschoenus maritimus,* common spike-rush Eleocharis palustris, slender spike rush *Eleocharis uniglumis*, reedmace *Typha latifolia*, jointed rush *Juncus articulatus*, and water plantain *Alisma plantago-aquatica*.

Bare ground / Ephemeral Vegetation

3.4.32 An area of recolonising hardstanding (foundations of demolished large buildings and associated yards) lies in the centre of Production Development Zone with a smaller area adjoining the northern boundary.

3.4.33 Thin layer of accumulated dry friable substrate lies on top of the hardstanding (bare ground) but remains largely unvegetated (Plate 19). A low diversity bryophyte carpets has formed in some locations, but the cover of herbaceous plants is sparse, comprising species that can tolerant periodic waterlogging including silverweed *Potentilla anserina*, eyebright., mint *Mentha* sp. and hard rush primarily around the margins where the recolonising shrub willows create partial shade. Yellow-wort was also an occasional colonist of the bare ground.

3.4.34 The area of hardstanding is enclosed on all sides by scrub woodland creating sheltered conditions equivalent to a glade (Plate 20).

3.4.35 The second small area of concrete hardstanding adjoins Phoenix Way on the northern boundary (Plate 21). It is associated with more established ephemeral vegetation cover and has a high percentage cover of bryophytes. Colonising species include perforate St john's wort, bird's- foot trefoil, eyebright, hard rush, common reed, jointed rush, southern marsh orchid, creeping willow, creeping cinquefoil and hairy sedge.

Railway embankment

3.4.36 The north facing embankment of the railway sidings primarily supports regenerating willow scrub and open areas colonised by bryophytes (Plate 22) with a few areas of sparsely vegetated clinker substrate. Colonising species included maidenhair spleenwort *Asplenium trichomanes*, polypody *Polypodium* sp., herb Robert and male fern along with the invasive non-native species, wall cotoneaster *Cotoneaster horizontalis*.

3.5 Crown Wharf

3.5.1 A linear, broadly rectangular area of level ground adjoins Crown Wharf, located between the open water dock and Phoenix Way. It is separated from the access road by a crash barrier which runs the length of the southern boundary.

3.5.2 The habitats are primarily stands of bracken and bramble thicket with scattered butterfly bush, willow scrub and two young sycamore *Acer pseudoplatanus* trees on the side of the dock.

3.5.3 The percentage cover of bracken is relatively high ay the western end and a layer of dead fronds has built up on the ground beneath. There is a transition to bramble thicket which is the dominant habitat in the eastern part of this area.

3.5.1 At the eastern end of this area, part of the old wooden berth remains intact. The surface is sparsely vegetated bare ground with a few bryophyte species form an extensive carpet over the ground with a low percentage cover of drought tolerant herb species growing on the consolidated crushed stone substrates. Locally frequent higher plants include biting stonecrop *Sedum acre*, false oat-grass *Arrhenatherum elatius*, hemp agrimony *Eupatorium cannabinum*, hogweed and butterfly bush.

3.5.2 A few small stands of Japanese knotweed are present on the side of the Phoenix Way to the east of Crown Wharf.

3.6 Temporary Construction Area 1

Overview

3.6.1 This location is previously developed land with a substrate of unsealed made ground consisting of a mix of materials including crushed concrete, steel waste slag, concrete and sealed tarmac with negligible soil cover.

3.6.2 Pioneer habitats are forming on the area through natural colonisation with a mosaic of open naturally regenerating grassland, mixed species ephemeral vegetation and sparsely vegetated bare ground. Shrub species are colonising and starting to coalesce into scrub on the eastern side.

3.6.3 This area adjoins the open water dock with a tarmac access track running parallel to the dock edge. The area is bounded to the east by an entrance road into Port Talbot steelworks and docks with a large industrial complex located close to the southern boundary.

Open Mosaic Habitat

3.6.4 The mosaic of sparse ephemeral vegetation, mixed species ephemeral vegetation, open structured grassland, and bare ground covers the majority of this area of the site (Plate 23). The botanical species assemblage for this habitat is presented in Appendix B.

3.6.5 The percentage cover of herbs, grasses and bryophytes varies across the habitat influenced by variation in the underlying substrate.

3.6.6 In mixed species ephemeral vegetation the herb cover is generally high (50% herb, 30% bryophyte 25 -50% cover with less than 10% bare ground), with the sparser vegetated areas generally between 50 and 70% bare ground.

3.6.7 A number of herb species occur frequently throughout; kidney vetch, black medick, and ribbed melilot and hawkweed oxtongue and becoming locally abundant (Plates 24 and 25). The main colonising grass species are creeping bent and Yorkshire fog which are both occur frequently with more localised areas of red fescue.

3.6.8 A wide range of species occur across the area at relatively low frequency including many indicators of neutral grassland. calcareous grassland and open mosaic habitat including wild carrot *Daucus carota*, yellow-wort, common centaury, hare's-foot clover *Trifolium arvense*, hop trefoil *Trifolium campestre*, perforate St John's wort and red clover *Trifolium pratense*.

3.6.9 Bird'-foot trefoil, quaking grass *Briza media*, bee orchid *Ophrys apifera*, pyramidal orchid, flattened meadow-grass *Poa compressus*, tansy *Tanacetum vulgare* and sheep's fescue *Festuca ovina* were all rare or present as localised populations.

3.6.10 Additional species occurring in most of the sparsely vegetated areas on crushed made ground include eyebright species, which was locally frequent, compact brome *Bromus madritensis*, fern grass, and fescues *Vulpia* spp.

3.6.11 Very sparsely vegetated ground in the centre of the site (Plate 26). These were species poor vegetation with buckshorn plantain the principal colonising species along with white stonecrop *Sedum album* and less frequently biting stonecrop *Sedum acre*. Only a few other herbs and grasses occur, and all at very low frequency.

3.6.12 Oxtongue broomrape *Orabanche picridis*, a nationally rare plant that parasitises hawkweed oxtongue, is locally frequent across much of the open mosaic habitat but largely absent from the sparsely vegetated areas in the centre (Plate 27).

Naturally regenerated grassland

3.6.13 Longer naturally regenerating grassland over 50% grass cover has established locally in the eastern half of the site where a shallow soil is forming over time (Plate 28). Yorkshire fog is the most abundant species. White clover locally abundant and ribwort plantain is frequent. A few of the species found in the mixed species ephemeral vegetation survive in the grassland most notably black medick, kidney vetch *Anthyllis vulneraria* and wild carrot. Grassland herb species include selfheal, ox-eye daisy *Leucanthenum vulgare*, yellow rattle *Rhinanthus minor*, common knapweed, yarrow, hairy tare *Vicia hirsuta*, wild parsnip, and tufted vetch and meadow vetchling. Locally false oat-grass and red fescue are abundant with cock's-foot frequent. Bramble has also colonised and is likely to be increasing in extent.

Scrub

3.6.14 Shrub willows, (primarily grey willow), and butterfly bush have colonised the eastern side of the area, including alongside the eastern boundary fence. Gorse *Ulex europaeus* has also colonised and is locally abundant. The shrubs are maturing but have not yet coalesced to form blocks of dense scrub and are associated with the naturally regenerating grassland which in places is becoming rank.

3.6.15 Young colonising scrub is scattered across the open mosaic habitat and is abundant on both sides of the surfaced track parallel to the edge of dock (Plates 29 and 30).

3.6.16 The dockside habitats have become substantially recolonised and primarily supports a mix of scattered scrub, abundant ivy *Hedera helix* growth and low bramble cover. Wall cotoneaster (invasive non-native) is frequent and hedge bedstraw *Galium mollugo* is locally abundant. A small block of dense willow and butterfly bush scrub is present at the southern end of the dockside.

3.7 Temporary Construction Area 2

Overview

3.7.1 Temporary Construction Area 2 adjoins the Phoenix Way is separated from the Production Development Zone by a large reedbed to the west and operational industrial sites to the north.

3.7.2 It is bounded by the disused railways to the south with the operational area of the steelworks beyond. The railway track has a gradual gradient running down diagonally from the higher ground in the centre of this area, to the level of the Phoenix Way on the north-eastern boundary.

3.7.3 Temporary Construction Area 2 is primarily scrub woodland dominated by shrub willows, with bramble thicket, bracken and stands of Japanese knotweed. Willow scrub extends into the margin of a 1ha area of reedbed on the western boundary.

3.7.4 The south-eastern part of the area is a mosaic of naturally generating grassland, and rank neutral grassland, tall ruderal and ephemeral vegetation with dense and scattered scrub. A lay-by alongside the Phoenix Way comprises unsealed bare ground.

Scrub Woodland

3.7.5 The scrub woodland comprises multi-stemmed willows with an understorey dominated by bramble vegetation growing up to 1m in height (Plates 31 and 32). Common nettle and male ferns occur occasionally.

3.7.6 The grey willow shrubs form a 10m high canopy. Dense bramble thicket and gorse occur in a central area where there is a gap in the willow canopy. The margins of the scrub woodland support of mix of bramble, butterfly bush, bracken, Japanese knotweed and tall ruderals with yellow flag iris *Iris pseudacorus* being present in low lying hollow.

Wet Woodland

3.7.7 The north-western part of the woodland comprises a mix of alder *Alnus glutinosa*, grey willow and goat willow on the margin of the reedbed (Plates 33 and 34). This are of woodland becomes seasonal flooded and the ground is sparsely vegetated. Common reed and hard rush occur at low frequency in areas of seasonal pooling with hairy sedge, bryophytes, bramble and dewberry growing on the drier edges. Pendulous sedge *Carex pendula* and hemp agrimony *Eupatorium cannabinum* occur rarely.

Naturally Regenerating Grassland

3.7.8 The south-eastern part of Temporary Construction Area 2 is small area (less than 0.1ha) supporting a mosaic of bramble and rank neutral grassland with tall ruderal vegetation on the boundary of the scrub woodland with smaller areas of more open neutral grassland and sparsely vegetated ground (Plate 35).

3.7.9 The more open grassland areas are characterised by abundant dewberry, hairy sedge, Yorkshire fog and red fescue.

3.7.10 Herb species recorded in the small area of grassland include common knapweed, yellow rattle, pyramidal orchid, common restharrow, marsh orchid species, eyebright species, wild carrot, hawkweed oxtongue, yarrow, wild parsnip, hop trefoil, tufted vetch, common mouse-ear *Cerastium fontanum*, common vetch, meadow vetchling, wild strawberry and common toadflax *Linaria vulgaris*.

3.7.11 The grassland structure becomes more rank on the margins of scrub with more frequent tall ruderals (hogweed, dock, spear thistle, teasel *Dipsacus fullonum*, evening primrose) and grass species include false-oat grass and hybrid couch grass (Plate 36).

3.7.12 The surface has undulations and hard rush, common fleabane, water mint, gipsywort *Lycopus europaeus*, and common reed were all noted where the ground was lower lying.

3.7.13 Very localised patches white stonecrop and bryophytes are growing over areas of sparsely vegetated hardstanding.

Invasive Non-Native plants

3.7.14 Stands of Japanese knotweed are present on the edges of the willow scrub woodland. The plant growth varies in height, age, and size throughout. The mature longer established stands are located more towards the centre, where it is intertwined with the willow scrub woodland.

3.7.15 Younger growth of Japanese knotweed is located sporadically around the borders of the habitats onsite. A few individual young plants were noted growing within the woodland and merging with the bramble thicket. However, the majority of the younger Japanese knotweed growth is situated on the southern boundary.

4 DISCUSSION AND RECOMMENDATIONS

Designated Sites

4.1.1 There are no statutory designated nature conservation sites within 2km of the site boundary of the Harbourside site.

4.1.2 The closest nationally important sites lie over 3km from the survey area: Margam Moors SSSI lies to the south of the steelworks and comprises coastal/floodplain grazing marsh. Eglwys Nunydd SSSI is designated for its waterfowl populations. Both designated sites are separated from the development areas by the steelworks with negligible habitat connectivity or linkage.

4.1.3 Kenfig SSSI/NNR/SAC, and Crymlyn Bog and Pant y Sais SSSI/NNR/SAC are all located within 10km of the survey with a small part of the Glaswelltiroedd Cefn Cribwr SSSI/SAC is located within 10km of the disused railway line.

4.1.4 There are five non-statutory designated sites located within 2km of the survey area.

4.1.5 Potential effects on statutory and non-statutory sites from the detailed development proposals will be assessed within the EcIA and ES chapter.

Habitats

4.1.1 Scrub willow has grown up over the last 20 years and as a habitat lacks structural and species diversity. The ground flora typically has low diversity and substantial areas remain sparsely vegetated beneath the multi-stemmed shrubs.

4.1.2 The very extensive stands of Japanese knotweed have low biodiversity value.

4.1.3 There are several areas of naturally regenerated grassland within the Production Development Zone, the largest area being in the eastern half with further areas on the northern boundary adjoining the Phoenix Way and grassland ‘glades’ in between blocks of willow scrub and Japanese knotweed.

4.1.4 The grasslands generally support a diversity of plants with over 30 grassland indicator species recorded across the habitats as a whole, reflecting the low nutrient status of the underlying substrates. This level of diversity confers the grassland habitats with county level importance. The other habitats present in the Production Development Zone are stands of bracken, bramble, hawthorn scrub, stands of reed (seasonally wet), and a very localised stand of dune slack vegetation.

4.1.5 Temporary Construction Area 1 supports primarily sparsely vegetated ground with scattered scrub, adjoining the eastern boundary of the open water dock. The regenerating habitats create a mosaic of bare ground, ephemeral vegetation and grassland which together classifies as an ‘open mosaic habitat on previously developed ground’ (OMH), a Section 7 Habitat of Principal Importance.

4.1.6 Willow scrub is the most extensive habitat in Temporary Construction Area 2, but the south-eastern section comprises a mix of naturally regenerated grassland, tall ruderal, scattered scrub, ephemeral vegetation and bracken. The western boundary overlaps the margin of the reedbed. A small seasonally flooded area of woodland with a canopy of alder and willow scrub classifies as wet woodland a Section 7 Habitats of Principal Importance.

4.1.7 A mitigation, compensation and biodiversity enhancement strategy should be designed for the development to fully offset the loss / damage to habitats and achieve an overall gain for biodiversity.

Bats

Roosts

4.1.8 There are no larger trees within the survey area with gaps or cavity features that would have the potential to provide roosts sites for bats. The open ivy cover on the two young semi-mature sycamores on the edge of the dock, within the Crown Wharf Berth area, have negligible value as potential roost features. The multi-stemmed willow shrubs have narrow diameter trunks and lack features that could be used by roosting bats

4.1.9 There are no buildings within the survey area although a car port adjoins the eastern boundary of the Production Development Zone. A daytime inspection of this structure should be undertaken to assess its potential to be used by roosting bats.

Activity

4.1.10 Overall the habitats in the Production Development Zone will be associated with an invertebrate fauna and would be expected to have a reasonable abundance of aerial invertebrates on which bats could prey, in particular the edges of scrub woodland and adjoining grassland and reedbed.

4.1.11 The Temporary Construction Area 2 supports a relatively small area of scrub woodland habitat and also has the potential to be used by foraging bats. The disused railway line and sidings to the south of this construction area and the Production Development Zone is a potential bat flightline.

4.1.12 In contrast the majority of Temporary Construction Area 1 is sparsely vegetated cover with only scattered young scrub and has lower potential value for foraging bats.

4.1.13 Bat activity surveys comprising transects and remote recording should be completed for the site to assess the assemblage of bat species that use the site and levels of activity for each species.

Otter

4.1.14 There are past records of otter from the River Afan to the north-west of Port Talbot Docks. As otter is a species with large territories it is assumed that the intertidal section of this river falls within the territory of an otter.

4.1.15 The open water dock lies adjacent to the mouth of the river and has the potential to be a foraging habitat for otter.

4.1.16 Within the survey area, the extensive 1ha reedbed located between the Production Development Zone and Temporary Construction Area 2 could also attract otter but its context, separated from the dock, by series of industrial operational units and areas of hardstanding means that there is no direct connectivity.

4.1.17 The multi-stemmed willow shrubs comprising the scrub woodland, generally lack areas of dense cover in which otters could remain hidden during the day.

4.1.18 Following a precautionary approach, the presence/absence of potential laying up places within the site should be assessed with a focus on any areas of dense cover within 100m of the open water dock.

Badger

4.1.19 No signs of badger activity were recorded within the survey area during the habitat walkover surveys in 2021 and 2022 or during other daytime walkover surveys. The potential value of the habitat for the establishment of setts and as foraging habitat is considered to be sub-optimal because of the nature of the site which is flat with limited burrowing opportunities and in part subject to winter waterlogging. No field signs of badger have been recorded during any of the

walkover survey visits. There is very high confidence in the absence of active setts within the survey area.

Breeding Birds

4.1.20 A number of the habitats present within the site have potential to be used by nesting birds. Bramble thicket, stands of gorse and hawthorn having highest potential value due to the cover they provide, while the stands of common reed and the stands of bracken are also habitats that could support nest sites.

4.1.21 The multi-stemmed willows and areas of butterfly bush have lower value providing fewer potential nesting opportunities to their very open growth structure (lacking areas of dense cover) and the narrow diameter of the limbs without internal cavities.

4.1.22 The stands of Japanese knotweed have low value as a habitat in which birds could nest. Following the removal of the accumulation of standing and fallen dead Japanese knotweed stems in spring 2022 there is minimal cover for nesting birds in the base of the stands.

4.1.23 An assessment should be made of the assemblage breeding birds in each part of the survey area, drawing upon observations of bird activity in summer 2022 and breeding survey work completed in equivalent habitats adjoining the boundary of the Production Development Zone.

Wintering birds

4.1.24 The scrub woodland and grassland habitats within the site have the potential to be used by a range of passerine species over winter feeding on seeds and invertebrates. Areas of seasonal pooling within the site could attract waders particularly snipe *Gallingo gallingo* which feed on invertebrates in wet mud in dense cover.

4.1.25 The open water dock has value for a number of gull and waterbird species. The sections of the dock adjoining Crown Wharf Berth and Temporary Construction Area 1 will form part of the habitats available to these species during winter months with old berth structures on the dockside providing a potential roost site for gulls and an area of reedbed on the opposite side of the water.

4.1.26 The walls of the dock are vertical sided with deep open water and no areas of tidal mud on the margins of the dock on which wader species could feed.

4.1.27 A survey of the wintering bird activity should be completed for the parts of the dock within and adjoining the proposed development and temporary working areas.

Reptiles

4.1.28 Reptile surveys in the wider docks in 2021 confirmed the presence of the common lizard, slow worm and grass snake with populations associated with grassland, scrub and wetland habitats.

4.1.29 The composition of habitats in the survey have potential value for reptiles and the record centre hold a past record of common lizard from the northern boundary of the Production Development Zone with the grassland, scrub woodland margins and reedbed being features of highest potential value.

4.1.30 A reptile survey should be completed to assess the presence /absence of species in the different parts of the survey area and review the potential sizes of populations of the different species where presence is confirmed.

Amphibians

Great Crested Newts

4.1.31 There is a past record of great created newt from a waterbody in the southern part of the Port Talbot steelworks, approximately 2.5km from the boundary of the survey area.

4.1.32 Surveys for great crested newts in the two waterbodies in wider Harbourside site, undertaken in 2021, have confirmed their very likely absence from the waterbody in the former mineral extraction (c675m west of the Production Development Zone) and the concrete sided pond below the artificial sand martin bank (c375m west of the Production Development Zone).

4.1.33 Within the Port Talbot steelworks the closest area of permanent open water with vegetated margin lies over 500m from the Production Development Zone and Temporary Construction Area 2.

4.1.34 Areas of unvegetated, potentially seasonal, open water within the steelworks should be assessed to determine if they have the potential to support breeding great crested newts. Any potential breeding habitat within 250m of the development/working areas should be subject to environmental DNA testing and traditional survey methods to determine the presence/absence of this species.

Invertebrates

4.1.35 The range of habitats and micro-habitats within the survey areas as a whole offers a wide range of opportunities for invertebrates within the Site. Open mosaic habitats in the Temporary Construction Area 1, flower-rich naturally regenerating grassland, and scrub will all contribute to the value of the site for invertebrates.

4.1.36 Many invertebrate species have very precise requirements for habitat ‘niches’ and the range of ground conditions increases the diversity of micro-habitats available to invertebrates. The wildflower populations will provide valuable sources of nectar and pollen in the context of the site and its surroundings.

4.1.37 Detailed surveys of terrestrial invertebrates in 2021 in the wider Harbourside site confirmed the presence of a number of red data book and Section 7 species, primarily associated with the grassland, banks, and flower-rich habitat features.

4.1.38 A precautionary assessment of the assemblage of invertebrates should be completed for the survey area, drawing upon surveys of equivalent habitats completed in the wider port.

Higher Plants

4.1.39 The botanical composition of the habitats has been assessed alongside the habitat surveys and have confirmed the presence of a range of positive indicator species and indicator species listed in the Guidelines for the Selection of Wildlife Sites in South Wales (The South Wales Wildlife Sites Partnership, 2004) and species listed as of local importance in the SEWBReC datasets.

4.1.40 A detailed survey of the legally protected Schedule 8 plant, oxtongue broomrape, was completed within the survey area in early July 2023 with guidance from the national experts Chris Thorogood and Fred Rumsey. The survey was undertaken alongside a survey of the wider Harbourside site to assess the distribution of the plant within the docks. A strategy will be required to protect the population of oxtongue broomrape.

4.1.41 In addition, basil thyme *Acinos arvensis*, a Section 7 species of principal importance, has recorded in the sidings area to the south of the Production Development Zone.

4.1.42 The development proposal should address the effects on locally important species associated with open naturally regenerating grassland and flower-rich ephemeral vegetation through measures integrated into the mitigation, compensation and biodiversity enhancement strategy.

Lower Plants

4.1.43 Bryophytes form a widespread component of many of the pioneer habitats establishing on the previously developed ground. A bryophyte survey should be undertaken to assess the species assemblages present in areas of habitat of higher potential value within the survey area. The survey should confirm the presence/likely absence of species of conservation concern and local importance.

4.2 Invasive Species (Schedule 9)

Japanese knotweed

4.2.1 Japanese knotweed has been present throughout large areas of Production Development Zone for many years and now forms very extensive stands. More localised stands occur within and adjoining in the Temporary Construction Area 2.

4.2.2 An Invasive Non-native Species (INNS) eradication strategy for the whole of the Port Talbot Docks is being designed and implemented by Associated British Ports (ABP) to eradicate the established stands and prevent future spread across. The first stage of the ABP management works is to remove the Japanese knotweed infestation within the Production Development Zone. These works are programmed for spring and summer 2023 and will result in the felling of scrub and disturbance of grassland habitats into which Japanese knotweed is spreading.

Other Schedule 9 Species

4.2.3 Two invasive species listed under Schedule 9 have been recorded within the site. Wall cotoneaster occurs extensively on the dockside in Temporary Construction Area 1 and on the railway embankment on the southern boundary of the Production Development Zone where it is more localised. Montbretia is present in localised patches in the centre of the Production Development Zone growing on the boundary of the scrub woodland.

4.2.4 Each species should be subject to systematic excavation in advance of earth movements to avoid spread. Materials could be temporarily stored and then subject to burial or removed from site. The control measures should form part of the INNS strategy and be implemented in advance of development.

Sea Buckthorn

4.2.5 Although sea buckthorn is not listed in Schedule 9 in Wales or England, it is non-native in South Wales and is an invasive species in the docks where it has colonised grassland habitats. All the established plants are spreading into the surrounding habitats and in few places form extensive stands.

4.2.6 Following good environmental practice enabling works and construction activities should be designed to avoid the spread any sea buckthorn encountered. The avoidance of the spread of the sea buckthorn should be included in the INNS eradication strategy for the port wide strategy.

5 CONCLUSIONS

5.1.1 A range of habitats occur within the survey area, the majority of which have established on previously developed ground. A few areas remain sparsely vegetated bare ground, but across the site there are extensive areas of open structured grassland, rank grassland and scrub woodland (dominated by young willows). The floristic diversity is locally high, primarily associated with open grassland associated patches of ephemeral vegetation.

5.1.2 One nationally rare legally protected plant species (oxtongue broomrape) and a number of locally important plant species occur within the survey area, primarily associated with open grassland habitats and ephemeral vegetation.

5.1.3 Where these habitats form a patchy mosaic they classify as a open mosaic habitats on previously developed ground (a habitat of principal importance). This is the principal habitat type in Temporary Construction Area 1.

5.1.4 The scrub woodland regenerating on previously developed ground is of recent origin and has relatively low nature conservation value. This habitat is most extensive in the Production Development Zone with Japanese knotweed growing alongside and within the scrub woodland in a number of areas.

5.1.5 The very extensive reedbed overlapping the boundary of Temporary Construction Area 2 qualify as a S7 Habitats of Principal Importance. The localised stands of reed in the Production Development Zone will be dry for over half of the year and have lower value.

5.1.6 Consistent with planning policy, the development seek to retain existing high value habitats through avoidance within the site layout and masterplan. Where avoidance is not possible, new areas of high value replacement habitat should be created within the wider port and/or as part of off-site compensation.

5.1.7 A specific strategy will need to be implemented for the conservation of the nationally important population of oxtongue broomrape. The potential for re-use of surface substrates and feasibility of the relocation of key plant species should be explored.

5.1.8 The recently established flower-rich pioneer habitats that characterise Temporary Construction Area 1 should be allowed to fully re-establish following the short term use of this area of land. The underlying substrate should be re-exposed and allowed to naturally regenerate. Viable seeds of many wildflower species will remain in the ground enabling a restoration to an open regenerating grassland and open mosaic habitat.

5.1.9 The development proposal should minimise the fragmentation of retained and created habitats and avoid indirect disturbance of off-site habitats through separation from construction activities.

5.1.10 Several invasive non-native species listed on Schedule 9 of the Wildlife and Countryside Act are present within the survey area. The control/eradication of Japanese knotweed and other Schedule 9 species will create benefits for biodiversity.

5.1.11 The survey area has value for a range of faunal populations. Development proposals should seek to limit impacts where possible and include the creation of new habitats for the species groups affected by development proposals. Phase 2 surveys should be completed for bats, badger, otter, birds, reptiles, great crested newts and bryophytes.

5.1.12 Avoidance, mitigation and compensation should specifically be addressed for the faunal populations within the site and the assemblages of species.

5.1.13 Features of value for specific faunal species should be incorporated into areas of replacement habitat and compensation areas. Broader species interests should also be considered in the mitigation and compensation offsetting effects associated with the development of the Harbourside site.

5.1.14 Faunal species protection measures will need to be implemented as part of the enabling works to comply with legislative obligations.

5.1.15 The mitigation, compensation and biodiversity enhancement should ensure that the development achieves an overall gain for biodiversity to fully offset the value of habitats that will be lost or damaged.

REFERENCES

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Multi-Agency Geographic Information for the Countryside: www.magic.gov.uk

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Legend

Site Boundaries

Rev	Description	By	CB	Date

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Client: LanzaTech

Project: Project Dragon

Title: Site Area Plan

Status	Drawn By	PM/Checked By
ISSUE	OW	TO
Project Number	**Scale @ A3**	**Date Created**
ECO02340	1:3,000	JAN 2023
Figure Number		**Rev**
1		-

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Legend

- Application Boundary
- Bare Ground/Sparsely Vegetated Ground
- Rubble
- Bracken
- Bramble Scrub
- Bramble Scrub and Japanese Knotweed
- Broadleaved Woodland
- Scrub Woodland (Grey Willow)
- Buildings
- Dune Slack Vegetation
- Dense Scrub
- Ephemeral Vegetation
- Gorse Scrub
- Hardstanding
- Ivy/Bramble/Scattered Scrub
- Japanese Knotweed
- Line of trees - Broadleaved
- Mature Conifer Tree Line
- Naturally Regenerating Grassland
- Naturally Regenerated Grassland (Semi-improved)
- Non-Ruderal (Ivy and Ferns)
- Non-native - invasive species
- Reedbed
- Scattered Scrub
- Scattered Trees
- Standing Water
- Open Water
- Scattered scrub
- Scattered tree - broadleaved
- Security Fence

Rev	Description	By	CB	Date

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Project: Project Dragon SAF Production Facility

Title: Habitat Plan

Status	Drawn By	PM/Checked By
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Project Number	**Scale @ A3**	**Date Created**
ECO02340	1:3,000	AUG 2023
Figure Number		**Rev**
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APPENDICES

Appendix A

Relevant Legislation

Reptiles

All common UK reptile species (Adder Vipera berus, Grass Snake Natrix natrix, Common Lizard Zootoca vivipara and Slow Worm Anguis fragilis) are protected through part of Section 9(1 and 5) of the Wildlife & Countryside Act 1981 (as amended). This prohibits:

- Intentional or reckless injuring or killing;
- Selling, offering or exposing for sale, or having in possession or transporting for the purpose of sale, any live or dead wild animal or any part of, or anything derived from, such an animal; or
- Publishing or causing to be published any advertisement likely to be understood as conveying buying or selling, or intending to buy or sell, any of those things.

These species are listed as Species of Principal Importance under Section 7 of the Environment (Wales) Act 2016.

Nesting Birds

All birds, their nests and eggs are afforded protection under the Wildlife and Countryside Act 1981, as updated by the Countryside and Rights of Way Act 2000. It is an offence to:

- intentionally kill, injure or take any wild bird;
- intentionally take, damage or destroy the nest of any wild bird while it is in use or being built; and
- intentionally take or destroy the egg of any wild bird.

Schedule 1 birds cannot be intentionally or recklessly disturbed when nesting and there are increased penalties for doing so. Licences can be issued to visit the nests of such birds for conservation, scientific or photographic purposes but not to allow disturbance during a development even in circumstances where that development is fully authorised by consents such as a valid planning permission.

Water Vole and Otter

Water vole and Otter and their habitats are fully protected under the Wildlife and Countryside Act 1981 (as amended). Under this legislation it is an offence to:

- Capture, kill or injure a Water Vole or Otter;
- Damage, destroy or obstruct access to a breeding site or resting place (i.e. burrow);
- Disturb a Water Vole or Otter whilst in a place of shelter;
- Possess or control a Water Vole or Otter (live or dead), any part of a Water Vole or Otter or anything derived from a Water Vole or Otter;
- Sell, barter or exchange a Water Vole or Otter (live or dead), any part of a Water Vole or Otter or anything derived from a Water Vole or Otter; and / or
- Advertise or offer for sale, barter or exchange a Water Vole or Otter (live or dead), any part of a water vole or Otter or anything derived from a Water Vole or Otter.

Offences can result from intentional or reckless actions. Penalties include fines of up to £5000 and / or imprisonment for up to six months, per offence. Under certain circumstances a licence can be granted by Natural England to permit activities that would otherwise constitute an offence.

Otters have additional protection, being listed as a European Protected Species (EPS) under Conservation of Habitats and Species Regulations 2017. This makes it an offence to deliberately or recklessly:

- Capture, injure or kill an Otter;

- Harass an Otter or group of Otters;
- Disturb an Otter in a holt or any other structure or place it uses for shelter or protection;
- Disturb an Otter while it is rearing or otherwise caring for its young;
- Obstruct access to a holt or other structure or place Otters use for shelter or protection or to otherwise deny the animal use of that place;
- Disturb an Otter in a manner that is, or in circumstances which are, likely to significantly affect the local distribution or abundance of the species;
- Disturb an Otter in a manner that is, or in circumstances which are, likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young.

It is also an offence to:

- Damage or destroy a breeding site or resting place of such an animal (note that this does not need to be deliberate or reckless to constitute an offence);
- Keep, transport, sell or exchange or offer for sale or exchange any wild Otter or any part or derivative of one (if obtained after 10 June 1994).

Both species are listed as Species of Principal Importance under Section 7 of the Environment (Wales) Act 2016.

Appendix B

Grassland and Ephemeral Plant Species Assemblages

Project Dragon – Botanical Species Lists

Scientific name	Common name	*Production Development Zone*	*Production Development Zone*	*Production Development Zone*	Temporary Construction Area 2	Temporary Construction Area 1	Status / Importance	SINC Indicator Species			
		Naturally Regenerated Grassland (Semi-improved)	*Naturally Regenerating Grassland (Open structure)*	*Dune slack vegetation*	*Naturally Regenerating Grassland*	*Ephemeral / Pioneer Grassland*		NG	CG	MG	PI
Achillea millefolium	Yarrow	LF	LF		LF						
Agrostis capilaris	Common bent	O	LF								
Agrostis stolonifera	Creeping bent	F	LF	O	O	LF					
Agrimonia eupatoria	Agrimony	O						**X**			
Anacamptis pyramidalis	Pyramidal orchid	VLF	O		O	O	**Local**		**X**		
Anagalis arvensis	Scarlet pimpernel		R								
Anthoxanthenum oderatum	Sweet vernal-grass	R			O	R					
Anthyllis vulneraria	Kidney vetch	O	O			F/LA	**Local**		**X**		
Arenaria serpyllifolia	Thyme-leaved sandwort	R	LF			F					
Arrhenatherum elatius	False oat-grass	LF/VLA	R		LF	O					
Artemisia vulgaris	Mugwort	R									
Betula sp.	Birch saplings	O		LF		R					
Blackstonia perfoliata	Yellow-wort	R	O			O/LF	**Local**		**X**		
Briza media	Quaking grass					VR		**X**	**X**		
Bromus hordeaceus	Soft brome	O	R		R	R					
Bromus madritensis	Compact brome					O					
Buddleia davidii	Butterfly bush	O	R		O	LF	**Non-native invasive**				
Carex arenaria	Sand sedge	R	LF	O		VLF					**X**
Carex flacca	Glaucous sedge	LO	O	F		L		**X**	**X**	**X**	
Carex hirta	Hairy sedge	F/LA	O		A	R					
Carex obtrubae	False fox sedge	R				R					
Carex spicata	Spiked sedge					R		**X**			
Carex punctata	Dotted sedge			VLF			**Local**				
Catapodium marinum	Fern grass		R			O					**X**
Centaurea nigra	Common knapweed	LF			O	R		**X**	**X**		
Centaurea scabiosa	Greater knapweed	R							**X**		
Centaurium erythraea	Common centaury	O	O			VLF		**X**	**X**		
Centranthus ruber	Red valerian					LF					
Cerastium arvense	Common mouse-ear	O	R		O	O					
Cerastium semidecandrum	Little mouse-ear										
Cirsium arvense	Creeping thistle	O	R								
Cirsium vulgare	Spear thistle	O			LF						
Conyza canadensis	Canadian fleabane	O	F		O	LF					

Scientific name	Common name	*Production Development Zone*	*Production Development Zone*	*Production Development Zone*	Temporary Construction Area 2	Temporary Construction Area 1	Status / Importance	SINC Indicator Species			
		Naturally Regenerated Grassland (Semi-improved)	*Naturally Regenerating Grassland (Open structure)*	*Dune slack vegetation*	*Naturally Regenerating Grassland*	*Ephemeral / Pioneer Grassland*		NG	CG	MG	PI
Cotoneaster horizontalis	Wall cotoneaster	LO	R			LF	**Schedule 9 INNS**				
Crepis capillaris	Smooth hawk's-beard	R				R					**X**
Crepis vesicaria	Beaked hawk's-beard					LF					
Crocosmia x crocosmiiflora	Montbretia	VLF					**Schedule 9 INNS**				
Dactylis glomerata	Cock's-foot	O	O		O	O					
Dactylorhiza sp.	Marsh orchid species	O			L					**X**	
Daucus carota	Wild carrot	O	O		O	LF			**X**		
Dipsacus fullonum	Teasal				R						**X**
Dryopteris filix mas	Male fern	R									
Echium vulgare	Viper's bugloss		R			O	**Local**		**X**		
Elymus (athericus / x obtusiuscula)	Sea / hybrid couch grass	VLF			LA						
Epilobium ciliatum	American willowherb		O			O					
Epilobium hirsutum	Great willowherb	O				O					
Epilobium parviflorum	Hoary willowherb		O			O					
Equisetum arvense	Field horsetail	R	R		R	R					
Erodium cicutarium	Common stork's-bill	R	L			O					
Eupatorium cannabinum	Hemp agrimony	O			O					**X**	
Euphrasia spp.	Eyebright species	R	O/LA	R	O	VLF	**Local**				
Festuca rubra	Red fescue	O/VLA	O/LF		O						
Festuca ovina	Sheep's fescue					L					**X**
Foeniculum vulgare	Fennel					R					
Fragaria vesca	Wild strawberry	R	R		O	R					
Galium mollugo	Hedge bedstraw	O/VLA				LA			**X**		
Galium saxatile	Heath bedstraw		VR		O						
Geranium dissectum	Cut-leaved crane's-bill	O	O		O	O					
Geranium molle	Dove's-foot crane's-bill	O	O			O					
Geranium pyrenaicum	Hedgerow cranesbill	R				R					
Geranium robertianum	Herb Robert				O	R					
Geranium rotundifolium	Round-leaved crane's-bill					O					
Heracleum sphondylium	Hogweed	O			LF						
Hieracium spp.	Hawkweed species	R	O			O/VL					
Hippophae rhamnoides	Sea buckthorn (sapling)	R					**Non-native invasive**				
Hirschfeldia incana	Hoary mustard	R				O					
Holcus lanatus	Yorkshire fog	A	O	O	A	A					
Hypochaeris radicata	Common cat's ear	R		R				**X**			
Hypericum perforatum	Perforate St John's wort	O/LF	O			O		**X**	**X**		
Hypericum tetrapterum	Square-stemmed St John's wort	R								**X**	
Jacobaea vulgaris	Common ragwort	R									
Juncus acutus	Sharp rush			O			**Local**				
Juncus articulatus	Jointed rush		R								

Scientific name	Common name	*Production Development Zone*	*Production Development Zone*	*Production Development Zone*	Temporary Construction Area 2	Temporary Construction Area 1	Status / Importance	SINC Indicator Species			
		Naturally Regenerated Grassland (Semi-improved)	*Naturally Regenerating Grassland (Open structure)*	*Dune slack vegetation*	*Naturally Regenerating Grassland*	*Ephemeral / Pioneer Grassland*		NG	CG	MG	PI
Juncus inflexus	Hard rush	R	O / VLF	F	O						
Juncus maritimus	Sea rush			O							
Lathyrus pratensis	Meadow vetchling	LF			O	R		**X**			
Leontodon hispidus	Rough hawkbit	R				R		**X**	**X**		
Leucanthenum vulgare	Oxeye daisy	O				O		**X**			
Linum bienne	Pale flax	O				LF	**Local**				
Linum cartharticum	Fairy flax		R			R		**X**	**X**		
Linaria pupurea	Purple toadflax	R									
Linaria vulgaris	Common toadflax	VR			R	R					**X**
Lotus corniculatus	Common bird's-foot trefoil	O	LF			O/LF		**X**	**X**		**X**
Lotus penducatus	Greater bird’s-foot trefoil	O/LA		R						**X**	
Luzula campestris	Field woodrush	O	O								
Medicago lupilina	Black medick	O	O/LF			F/LA			**X**		
Melilotus officinalis	Ribbed Melilot	O/LA				O/VLA					
Mentha sp	Mint species	R	LF	F		R				**X**	
Myosotis arvensis	Field forget-me-not		O			O					
Odonitites vernus	Red bartsia	O	O		R	O					
Oenothera spp.	Evening primrose species	O	LF			O					
Ononis repens	Creeping restharrow	O	F/VLA		LF	O		**X**	**X**		
Ophrys apifera	Bee orchid					R	**Local**		**X**		
Orobanche minor	Common broomrape		R			O	**Local**				**X**
Orobanche picridis	Oxtongue broomrape		VR			F	**National**				
Pastinacea sativa	Wild parsnip	O	LF		R	O/LF			**X**		
Phragmites australis	Common reed	R		O	R					**X**	
Picris hieracioides	Hawkweed oxtongue	R	O			F	**Local**		**X**		
Pilosella officinarium agg.	Mouse eared hawkweed					L		**X**	**X**		**X**
Plantago coronopus	Buck’s-horn plantain					VLA					**X**
Plantago lanceolata	Ribwort plantain	LF	F		O	LF					
Plantago major	Greater plantain		R								
Poa compressa	Flattened meadow-grass					O					**X**
Poa pratensis agg.	Smooth meadow-grass	O	O			F					
Poa trivialis	Rough meadow grass	LF									
Potentilla anserina	Silverweed	O/LF	O		O						
Potentilla mixta	Hybrid creeping cinquefoil	VR									
Potentilla reptans	Creeping cinquefoil	F/LA	F		O	LF					
Prunella vulgaris	Selfheal	O	O		O	O					
Pulicaris dysentrica	Common fleabane	O	O		O	O				**X**	
Ranunculus acris	Meadow buttercup	R									
Ranunculus flammula	Lesser spearwort	R		R						**X**	
Ranunculus repens	Creeping buttercup	LF		O							

Scientific name	Common name	*Production Development Zone*	*Production Development Zone*	*Production Development Zone*	Temporary Construction Area 2	Temporary Construction Area 1	Status / Importance	SINC Indicator Species			
		Naturally Regenerated Grassland (Semi-improved)	*Naturally Regenerating Grassland (Open structure)*	*Dune slack vegetation*	*Naturally Regenerating Grassland*	*Ephemeral / Pioneer Grassland*		NG	CG	MG	PI
Reseda luteola	Weld		R								
Reynoutria japonica	Japanese knotweed (young)	LF	LF		O						
Rhinanthus minor	Yellow rattle	VL			L	O		**X**			
Rubus caesius	Dewberry	A/LD	O/LA	O	A	F					
Rubus fruticosus agg.	Bramble	O	R			R					
Rumex acetosella	Sheep's sorrel		VR								
Rumex crispus	Curled dock	O	O			O					
Salix repens var. argentea	Creeping willow	O/VLF	VLF	A						**X**	
Salix spp. (sapling)	Willow shrub saplings	O	O/LF	LF	O	O					
Saxifraga tridactylis	Rue-leaved saxifrage					VL			**X**		
Scrophularia nodosa,	Common figwort	R									
Sedum acre	Biting stonecrop		R			LF					
Sedum album	White stonecrop		O/VLD		LF	LF					
Senecio squalidus	Oxford ragwort		R								
Silene flos-cuculi	Ragged robin	R								**X**	
Sonchus oleraceus	Smooth sow-thistle					R					
Tanacetum vulgare	Tansy					R					**X**
Taraxicum agg.	Dandelion	O	R		R	R					
Trifolium arvense	Hare's-foot clover		R			LF					
Trifolium campestre	Hop trefoil		R		O	LF			**X**		**X**
Trifolium dubium	Lesser trefoil		R			R					
Trifolium medium	Zig-zag clover	R						**X**			
Trifolium pratense	Red clover	LF			O	O		**X**			
Trifolium repens	White clover	O/VLA				O/VLA					
Tussilago farfara	Colt's-foot	O	O								**X**
Urtica dioica	Common nettle	R			R	R					
Verbascum thapsus	Great mullein		R								**X**
Veronica chaemdrys	Germander speedwell	O	O								
Vicia cracca	Tufted vetch	O/LF			O	R					
Vicia hirsuta	Hairy tare					L					
Vicia sativa agg.	Common vetch	O			O	O					
Vicia tetrasperma	Smooth tare	LF		O							
Verbena officinalis	Vervain		R								
Vulpia bromoides	Squirrel's-tail fescue					LF		**X**	**X**		**X**
Vulpia myuros	Rat's-tail fescue					O					**X**

SINC Indicator Species – Habitat Types

NG = Neutral Grassland; CG = Calcareous Grassland; MG = Marshy Grassland; P-I = Post-industrial

Appendix C

Habitat Photographs - Production Development Zone

Habitat Photographs – Production Development Zone

Plate 1: Regenerating willow scrub with sparse ground flora	Plate 2: Dense young willow scrub with dewberry field layer
	
Plate 3: Open structured willow scrub with dewberry field layer	**Plate 4: Regrowth of extensive Japanese knotweed**
	

Plate 5: Extensive Japanese knotweed with dead stems removed	Plate 6: Willow scrub with Japanese knotweed (background)
	
Plate 7: South-eastern grassland strip on sandy substrate	**Plate 8: North-eastern grassland**
	

Plate 9: North eastern boundary grassland	Plate 10: Northern boundary grassland
	
Plate 11: Northern boundary grassland with sandy substrate	**Plate 12: Grassland 'glade' with reed, JKW, dewberry and bramble**
	

Plate 13: Central grassland glade with wildflowers	Plate 14: Central grassland glade with encroachment of bramble
	
Plate 15: Central 'glade' – bramble thicket	**Plate 16: Southern grassland strip**
	

Plate 17: Dune slack plant assemblage	Plate 18: Scrub enclosing stand of common reed
	
Plate 19: Central area of bare ground with scattered scrub	**Plate 20: Part of central bare ground subject to seasonal pooling**
	

Plate 21: Ephemeral vegetation establishing on hardstanding	Plate 22: Railway Embankment
	

Appendix D

Habitat Photographs – Temporary Construction Areas

Habitat Photographs – Temporary Construction Area 1

Plate 23: Naturally regenerating grassland mosaic	Plate 24: Ephemeral vegetation on tracksides
	
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Annex B

Phase 2 Species Surveys Report

PHASE 2 SPECIES SURVEY REPORT 2022

Project Dragon, Port Talbot

ECO02340
February 2023

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1 INTRODUCTION

1.1 Purpose and scope of this report

1.1.1 RPS were commissioned by LanzaTech to undertake Phase 2 surveys for relevant species groups for land parcels within Port Talbot Docks.

1.1.2 The Project Dragon Survey area comprises the following land parcels defined by the Survey area Boundary shown on Drawing 1 (ECO02340-0003-01) with the central Ordnance Survey grid references provided below.

- Production Development Zone – approximately 9.5ha (SS 764886)
- Crown Wharf – terrestrial habitats approximately 0.3ha (SS 765887)
- Temporary Construction Area 1 – approximately 3.2ha (SS 770887)
- Temporary Construction Area 2 – approximately 1ha (SS 768884)
- Railway sidings

1.1.3 Based on existing knowledge of the site and the findings of previous species surveys it was understood that the site either supported or had the potential to support several species of principal importance in Wales which are legally protected.

1.1.4 This report provides the results of the following species surveys undertaken between the end of May and September 2022. These surveys assessed the likely presence or absence of these species on site, and if present to ascertain the ways in which the local populations are utilising the site:

- Seasonal bat activity transect surveys
- Remote bat recording survey
- Reptile presence/absence survey
- Badger sett and activity survey
- Otter presence/absence survey
- Great crested newt scoping survey

1.1.5 An Ecological Impact Assessment is being prepared for the development proposal and the species surveys have been used to help define the presence/absence of species that will need to be considered in assessment process.

1.1.6 This report presents the factual findings of the listed Phase 2 surveys completed in 2022. An evaluation of the site's value for relevant species groups is given along with a broad assessment of potential impacts with outline recommendations on how impacts may be avoided.

1.1.7 This report pertains to these results only; recommendations included within this report are the professional opinion of an experienced ecologist and therefore the view of RPS. The surveys and desk-based assessments undertaken as part of this review and subsequent report including the Ecological Appraisal Notes are prepared in accordance with the British Standard for Biodiversity Code of Practice for Planning and Development (BS42020:2013).

1.2 Other Species Surveys and Report

1.2.1 Other Phase 2 surveys completed in 2022 are reported separately.

1.2.2 A specialist bryophyte survey of all accessible parts of Survey area which was carried out in October 2022 and is presented in a stand alone report.

1.2.3 Overwintering bird activity on the open water dock focussing on Crown Wharf and Margam Wharf is being recorded overwinter 2022/2023 during monthly surveys. Monthly overwintering bird survey visits covering the Production Development Zone in winter 2021/2022, which was part of a wider survey covering the whole of the Harbourside landholding. The results of this survey are presented in a stand alone breeding and wintering bird survey report.

1.3 Study area and Zone of Influence

1.3.1 The Production Development Zone (PDZ) lies at the eastern end of the Harbourside site within Port Talbot Docks, comprising primarily naturally regenerating willow scrub and grassland with extensive areas of Japanese knotweed. A 4m high embankment rises up to the level of the railway sidings to the south.

1.3.2 The PDZ forms the eastern section of Harbourside site within Port Talbot Docks, which as a whole comprises an extensive area of previously developed land that is naturally regenerating with the main component habitats being willow scrub, grassland, and ephemeral vegetation with localised areas of bare ground.

1.3.3 Phoenix Way forms the northern boundary PDZ with an operational cement works and open water dock to the north and further operational industrial units to the east.

1.3.4 Crown Wharf lies on the side of the open water dock to the north of the eastern half of the PDZ. This part of the Survey area is a narrow strip of vegetation between the road and the dock.

1.3.5 Temporary Construction Area 1 (known as Margam Wharf) is located at the eastern end of the open water dock over 250m east of the boundary of the PDZ.

1.3.6 Temporary Construction Area 2 is located over 200m east of the PDZ separated from it by operation industrial sites a 1.2ha reedbed bounded by willow scrub.

1.3.7 The immediate context of the Survey area is dominated by industrial activities with the very extensive Tata Steel works to the south, and operational industrial sites, within ABP land ownership, adjoining the eastern boundary of the PDZ.

1.3.8 The open water dock is bounded by the associated wharfs and has some extensive stands of reedbed on the margins. The tidal section of the River Afan running to the north-west of the dock. An operational harbour enclosed by breakwaters lies 1km to the west of the PDZ beyond the wider Harbourside site.

1.4 Previous Species Surveys

Production Development Zone

Habitats

1.4.1 A Phase 1 Habitat survey of the wider Harbourside Site (including part of the Survey area Boundary was undertaken in summer 2021 and updated in summer 2022. The results are presented in the baseline section of Ecological Impact Assessment (EcIA).

Wider Harbourside Landholding

1.4.2 A series of species surveys were undertaken form the western and central areas of the Harbourside site in 2021 covering the following species / species groups: foraging bats, breeding birds, wintering birds, great crested newts, reptiles, invertebrates, otter, water vole and badger. Previously a reptile survey had been completed within the former mineral extraction in the eastern part of the Harbourside site in May 2015. The findings of the previous surveys of bat activity, reptile, great crested newt, badger and otter are summarised below.

Bats

1.4.3 Surveys in 2021 recorded only low levels of bat foraging activity in the habitats across the Harbourside site. Most of the recorded activity related to common and soprano pipistrelle with the edges of the blocks of willow scrub being used by bats moving through the landscape. The former mineral extraction and reedbed/waterbody was the feature most regularly used by foraging bats.

1.4.4 Regular but low level noctule activity was recorded on the western boundary of the PDZ indicating the possible use of the disused railway line as a commuting flight line. A very small number of passes of Nathusius' pipistrelle and a single Myotis species pass were also recorded over the whole of the summer survey period.

Reptiles

1.4.5 The Harbourside site supports three resident reptile species: common lizard, slow-worm, grass snake and slow-worm. Across the c33ha Harbourside site as a whole, the habitats support an exceptional population of common lizard (multiple good populations) with the populations primarily associated with open structured grassland habitats. A good population of slow-worm population is concentrated on the rank grassy edges of scrub habitats including bramble and willow. Small number of sub-adult grass snake was found in the former extraction and the adjoining grassy banks. There were also very occasional ad hoc sightings of adult grass snakes around the margins of the reedbed / waterbody in the base of mineral extraction.

Great crested Newts

1.4.6 Past surveys have concluded that GCN are absent from the Harbourside site based on environmental DNA (eDNA) survey and traditional population surveys.

1.4.7 The reedbed/waterbody in the former mineral extraction, (located 650m west of the boundary of PDZ) was surveyed in spring 2021 and 2019. Due to the size of the waterbody with multiple areas of open water partially separated by stands of reed each accessible area of open water was individually tested for GCN DNA.

1.4.8 The small man-made pond situated directly below the artificial sand martin bank was also subject to eDNA testing in spring 2022. This waterbody lies 380m from the boundary of the PDZ.

Badger and Otter

1.4.9 The surveys confirmed the very likely absence of badgers in the western and central sections of the Harbourside site with no evidence of foraging activity, dung pits or setts.

1.4.10 No signs of otter activity were recorded around the reedbed/waterbody or on the trail cameras positioned on mammal paths on the margins. It was concluded that the value of this feature as a foraging resource for otter is limited, but because the reedbed is located close to the mouth of the River Afan, there is potential for occasional use by otter.

1.4.11 Foxes were regularly seen within the site with a number of paths running through the site. Fox was the only mammal recorded on the trail cameras.

2 METHODS

2.1 Bats

Activity Survey

2.1.1 Bat activity transect surveys were undertaken, the purpose of which were to record and assess how bats were utilising the site for foraging and commuting. The transect surveys were focussed on the PDZ, the main development area. Surveys were carried out monthly between late May 2022 and mid-September 2022. The dates and times of the activity surveys are summarised in Table 2.1. All activity surveys were conducted in suitable weather conditions.

2.1.2 Each of the surveys was carried out by a team of two experienced bat surveyors, equipped with a Batlogger M detector. A transect route was devised along a route that could be safely followed by surveyors and give the best possible coverage of all suitable bat foraging habitats on site. The same broad transect route was followed on each occasion but the start point, and direction of travel was altered between survey visits to gather information on any variation in levels of activity in different parts of the site over the post-dusk period.

2.1.3 On each survey, the transect was walked starting at sunset and ending two hours after sunset. Notes were taken on the number of bats seen, their location, flight direction, behaviour (e.g. foraging or commuting passes) and likely species based on information from the detector.

2.1.4 Several point counts were undertaken at regular intervals along the transect, where the surveyors stopped and recorded all bat activity over four-minute periods. All detected calls were analysed using Bat Explorer software.

Table 2.1: Weather conditions during bat transect surveys at Production Development Zone

Survey date	Temperature at sunset (ºC)	Sunset time	Precipitation	Wind (Beaufort scale: 0-12)	Cloud cover (Oktas: 0-8)
15/06/2022	16	21:34	Dry	1 – light air	0 – no cloud
18/07/2022	25	21:25	Dry	1 – light air	7 - overcast
15/09/2022	15	19:30	Dry	1 – light air	2 – little cloud cover

Static Remote Recording

2.1.5 Transect surveys were supplemented by remote recording on automated ultrasound bat detectors which gave a more extensive image of the geographical species coverage across the site and captured bat activity outside of the time constraints of the transect surveys.

2.1.6 Static detectors (Wildlife Acoustics SM4 models) were deployed throughout the site in multiple locations on likely flight lines / foraging features and left to record for at least 10 consecutive nights throughout spring, mid-summer, and late summer. This would ensure that we captured recordings from at least 5 nights which were recorded in suitable weather conditions. The results of the transect surveys were used to influence the placement of the remotely sited static detectors during the latter half of the survey.

2.1.7 The locations of remote static detectors are illustrated in Drawing 2: Remote Static Detector Locations (ECO02340-0002-01).

2.1.8 In each season, five-night recording periods were selected for analysis, coinciding with optimal weather conditions derived from weather data from https://www.timeanddate.com/weather/uk. The analysis periods are provided in Table 2.2 below

2.1.9 On each night, recording began at 30 minutes before sunset and ending 30 minutes after sunrise to cover the peak times that bats would be commuting to and from their roosts. Analysis of recordings was carried out using Wildlife Acoustics Kaleidoscope software.

Table 2.2: Remote recording analysis dates 2022

Detector ID	Season	What 3 Word	Duration	Dates Analysed
A	Spring	///chats.dollar.major	> 10 Nights	N/A
B	Spring	///toolbar.booklets.plotted	> 10 Nights	20/05/2022 – 25/05/2022
C	Spring	///cavalier.concerts.wiring	> 10 Nights	20/05/2022 – 25/05/2022
D	Mid-summer	///speeding.converter.youths	1 Night	22/06/2022
E	Mid-summer	///basket.risky.eventful	1 Night	22/06/2022
F	Mid-summer	///toned.dock.tree	1 Night	22/06/2022
G	Mid-summer	///thank.vessel.shrimp	> 10 Nights	20/07/2022 – 25/07/2022
H	Mid-summer	///rejoin.spelled.adapt	> 10 Nights	20/07/2022 – 25/07/2022
I	Mid-summer	///ramp.amounting.laser	> 10 Nights	20/07/2022 – 25/07/2022
J	Late summer	///idea.afflicted.influencing	> 10 Nights	01/09/2022 – 06/09/2022
K	Late summer	///button.squad.assure	> 10 Nights	01/09/2022 – 06/09/2022
L	Late summer	///dust.soak.drag	> 10 Nights	01/09/2022 – 06/09/2022

2.2 Reptile Survey

2.2.1 The reptile survey was carried out in accordance with the recommended methodology outlined in the Herpetofauna Workers' Manual (JNCC, 2003) and the Froglife Advice Sheet 10 (1999). The surveys were undertaken between June and October.

2.2.2 Prior to setting out the refuges a visual assessment was carried out to define for each of the areas subject to reptile survey and areas of hibernation potential within the PDZ were mapped.

2.2.3 With extensive suitable habitat across the large site, the placement of mats was designed to cover the highest value habitats with each refuge mat placed in habitats with the potential to support a population of at least one species of reptile.

2.2.4 The refuge mats provide shelter and basking opportunities and are typically used at the start and end of the day especially in spring and early autumn when the daytime temperatures are lower, and individuals will need to bask to be able to hunt prey.

2.2.5 The mats were placed to have an aspect that would receive sun in the morning and where possible, mid-afternoon onwards.

2.2.6 The distribution of refuges was designed to achieve a reasonable distribution across the whole site. Within the PDZ the refuges specifically covered focussed on the grassy edges of scrub woodland, mosaics of open and dense grassland and the grassland glades within the scrub woodland. Mats were placed on the margins of Japanese knotweed stands but were not placed in the centre of these stands or beneath the canopy of the scrub willow.

2.2.7 Wherever possible the mats were located close to dense vegetation cover, although much of the scrub willow has a very sparse understorey and some mats were placed in areas with limited cover in order to achieve a wider distribution across on PDZ.

2.2.8 In total 412 refuge mats were set out across the site in August 2022. The refuge mats were placed out across accessible locations within the PDZ (190), in accessible parts of the habitat strip alongside Crown Wharf (10), Temporary Construction Area 1 (30) and Temporary Construction Area 2 (22).

2.2.9 An additional refuge mats (160) placed out on the railway sidings south of the PDZ in late August 2022. The distribution of the refuge mats is shown on Drawing 5.

2.2.10 Each refuge mat consisted of a rectangle of bitumen roofing felt measuring a minimum of least 50 cm x 50 cm. The felt mats were supplemented with 24 (No.) 50cm x 50cm corrugated tins which were primarily selectively placed around the trees and scrub habitat in the eastern and western sections of the production development zone.

2.2.11 The refuge mats were left to bed down for over four weeks before the first survey visit was undertaken. This ensured the vegetation below the mat had died back and that the ground beneath the mats would have developed humidity and temperature gradients favoured by reptiles. The bedding down period also allows individuals to locate and use mats placed in or close to their territory.

2.2.12 Due to the size of the site, survey visits (excluding the sidings area) were undertaken across 10 survey visits primarily completed between late August and early October. The sidings were surveyed over seven visits between early and late October.

2.2.13 A combination of mid-late afternoon and morning surveys were employed where the daytime air temperature was between 12 and 19^{o} C with relatively light wind. Sunny conditions were selected wherever possible. Different areas of the site were surveyed on each date so that the refuge mats were checked during optimum weather conditions. The dates of the survey visits and areas covered are provided in Table 2.1.

Table 2.3 Reptile survey visits - Survey areas

Survey No.	Date	Production Development Zone	Railway Sidings East and West	Temporary Construction Area 2	Temporary Construction Area 1	Crown Wharf
1	31/08/22	✓	-	✓	✓	✓
2	13/09/22	✓	-	✓	✓	✓
3	15/09/22	✓	-	✓	✓	✓
4	16/09/22	✓	-	✓	✓	✓
4	20/09/22	✓	-	✓	✓	-
5	22/09/22	✓	✓	✓	✓	✓
6	26/09/22	✓p	-	-	-	-
7	28/09/22	✓	✓	✓	-	✓
8	06/10/22	✓	✓	✓	✓	-
9	11/10/22	✓	✓	-	-	✓
10	13/10/22	-	✓	-	-	-
11	18/10/22	-	✓	-	-	-
12	20/10/22	-	✓	-	-	-
	TOTAL NO.	**9**	**7**	**8**	**7**	**7**

2.2.14 During each visit all the refuge mats were checked for the presence of reptiles by the surveyor.

2.2.15 The mats and other areas of potential basking areas including boulders, and rocks were checked from a distance for the presence of reptiles using binoculars whilst walking between refuge mats.

2.2.16 All observed reptiles were recorded. Where observation allowed the sex and age class (juvenile or adult) was recorded.

2.3 Badger Survey

2.3.1 During walkover habitat surveys in June and July 2022, the different parts of the Survey area, searches were made for signs of badger activity to assess if any part overlaps an active badger territory. Evidence searched for included badger latrines; dung pits, foraging (snuffle holes), and prints. Mammal paths were inspected to gauge the potential for use by badgers.

2.3.2 During the reptile survey visits in September, the surveyors also looked for dung pits and signs of foraging activity. Any activity recorded was mapped with GPS co-ordinates taken to define locations.

2.4 Otter Survey

2.4.1 An initial review was undertaken to assess the potential value of each section of the Survey area for otter and an overall assessment of the potential of terrestrial habitats in each section of the Survey area to be used by otter was defined.

2.4.2 Areas were excluded from the survey included Temporary Construction Area 1 due to being sparsely vegetated ground and the disused railway sidings / railway line due to its distance from the open water dock.

2.4.3 Walkover surveys of Temporary Construction Area 2 and PDZ were conducted between September 2022 and January 2023. Each walkover survey visit was conducted during dry weather conditions when there was good visibility, avoiding strong winds and heavy rain.

2.4.4 All features / habitats with at least some areas of dense cover were assessed and were physically accessed wherever possible. Where the scrub vegetation was very dense such as bramble thicket and dense reed, the margins were searched for signs of clear mammal paths large enough to be used by otter.

2.4.5 Alongside the identification of mammal paths with the potential to be used by otter, searches were made for otter field signs including spraints, prints in soft ground, and the remains of prey items such as fish, crab carapace, shellfish or skinned amphibians. Any activity recorded was mapped with GPS co-ordinates taken to define locations.

2.4.6 The terrestrial habitat survey assessed the potential for features to be used as a place of shelter, including above-ground resting sites (couches) and cavity/burrow features with the potential to be used as a holt. Couches can sometimes consist of no more than an area of flattened grass or earth. Features associated with otter holts include tunnels in banks, cavities beneath tree root-plates, and cavities in man-made structures such as disused drainage pipes.

Remote Camera Recording

2.4.7 A remote motion-sensing camera was set up on a mammal path in an open area of willow scrub woodland between the margin of the extensive reedbed and a bramble thicket close to the northern boundary of Temporary Construction Area 2. The camera remained in place throughout September and October 2022. A trial camera was also placed on a clear mammal path (probable fox) on the northern boundary of the PDZ close to an area of dense reed between October and January.

2.4.8 The cameras were placed in locations where animals using the path would trigger the camera and video while avoiding positions where the camera would be triggered by foliage moving in the wind.

Footage from the trial camera was systematically checked for evidence of use by otters and other species of mammal.

2.5 Limitations

Production Development Zone – All surveys

2.5.1 Areas of the PDZ were covered by dense Japanese Knotweed to the extent that parts of the area were inaccessible. Every effort was made to assess suitability of the area for a range of species but due to accessibility issues, this wasn't possible for all areas especially in the PDZ.

Bat Activity Transect Surveys

2.5.2 Significant light pollution was observed from compound of the neighbouring cement works to the north of the PDZ. The light emitted from the overhead compound lights illuminated the northern boundary of the production development zone area and the widespread Japanese knotweed towards the centre of the site. Streetlights also illuminate the unnamed port road adjoining the entire northern boundary of the PDZ.

Static Detector Recording

2.5.3 Due to the public and industrial nature of the site and the high levels of footfall across the site, it was necessary to secure the recording equipment in positions that were out of reach and relatively obscure, in order to reduce the likelihood of them being subject to theft or vandalism. Particularly when the detectors were placed within hedgerow or treelines this meant that they were covered in more foliage than would normally be considered optimal.

2.5.4 The detector placed on the woodland edge close on the north-western boundary of the PDZ in late May recorded noise files which upon analysis were recordings of the traffic using the unnamed port road and possibly operational noise from the adjacent operational site. Observations during transect surveys were used to define the levels of activity in this part of the PDZ.

Reptile Surveys

2.5.5 Due to the size of the site, areas of grassland and scattered scrub were subject to sampling. Mats were located where there was structural variety with good cover and basking areas. This approach will not have been a constraint on the assessment of presence / absence of the different reptile species in each area of the site, but the low density of refuges will limit the accuracy of estimating population size.

2.5.6 Changes in weather conditions during survey visits required transects/mat checks to be temporarily halted on several occasions.

2.5.7 One survey (26th September) was stopped with only part coverage of the PDZ with the reminder of the survey areas covered during the replacement survey visit. Overall good coverage the whole site was achieved over the extended period of survey visits.

General Limitations of Ecological Surveys

2.5.8 It should be noted that whilst every effort has been made to provide a comprehensive description of the site, no investigation can ensure the complete characterisation and prediction of the natural environment.

Accurate Lifespan of Ecological Data

2.5.9 The majority of ecological data remain valid for only short periods due to the inherently transient nature of the subject.

2.5.10 The assessment of protected species potential contained in this report are considered likely to be accurate for up to three years, assuming no significant changes to the site conditions.

3 BAT SURVEY RESULTS

3.1 Activity Transect Surveys

3.1.1 Two species of the 18 resident British bat species were recorded within the Survey area (excluding the disused railway line) during the transect surveys and/or remote recording: common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle and noctule.

3.1.2 A summary of the activity recorded during transect surveys is presented in Table 3.1. The areas of bat activity during the transect surveys are illustrated on Drawings 3 and 4 (ECO02340-0006 and ECO02340-0007).

Table 3.1: Bat activity levels recorded on transect surveys

Season	Passes per species – Total				Total no. of passes
	Common pipistrelle	Soprano pipistrelle	Nathusius' pipistrelle	Noctule	
Spring	58	0	0	0	**58**
Mid-summer	22	0	0	0	**22**
Late summer	39	1	0	0	**40**

3.1.3 Across the transect surveys, all but one of the detections of bat activity related to common pipistrelle bats with only a single bat pass of a soprano pipistrelle. The majority of activity was associated with the north-eastern and eastern parts of the PDZ with extended periods of foraging for a small number of bats.

3.1.4 Only low levels of bat activity (occasional, infrequent commuting passes) were recorded in the centre of the PDZ with no areas being used for extended foraging. Each transect survey also included point counts in Temporary Construction Areas. Common pipistrelle was very rarely encountered in the Temporary Construction Area 1 and no bat activity was detected during transect surveys in Temporary Construction Area 2.

3.2 Remote Recording (Static Detectors)

3.2.1 A summary of the level of activity recorded on remote detectors deployed in PDZ and Crown Wharf is presented in Table 3.3. The relatively low levels of bat activity on the remote recorders mirrored the results of the transect surveys. Common pipistrelle being the principal species recorded in every location. An average of less than 20 bat passes per night were recorded in four of the seven remote recording locations.

3.2.2 Two locations in July had noticeably higher levels of activity indicating that the detectors were located within common pipistrelle foraging habitat. These were in mixed species scrub on the eastern boundary where there is shelter from a line of conifer trees where there was an average of

185 calls/night and on the southern boundary of the PDZ where the scrub woodland adjoins the railway sidings with an average of 120 calls per night.

3.2.3 Remote recording in Crown Wharf recorded low levels of bat activity in July with slightly higher levels of activity in September. The levels of soprano pipistrelle activity (average of 24 calls per night) and noctule activity (average of 3 calls per night) were higher in this location than in other remote recording locations within the site.

3.2.4 Nathusius' pipistrelle bat was remoted on only one detector over the full survey, with single confirmed pass on the western boundary of the PDZ on the scrubby boundary adjoining a very extensive stand of Japanese knotweed.

3.2.5 Noctule bats were consistently recorded at low frequency on remote detectors.

Table 3.2: Comparison of bat activity levels recorded on remote detectors

Season	Remote Detector ID	Habitat location	Average passes per night over 5 day recording period			
			Common pipistrelle	Soprano pipistrelle	Nathusius' pipistrelle	Noctule
Spring	A*	North-western part of PDZ; scrub woodland adjacent to semi-improved naturally regenerating grassland in	-	-	-	-
	B	Western part of PDZ; scrub adjacent to very extensive stand of Japanese knotweed	5	0	0.2	0.4
	C	South-eastern part of PDZ; bramble scrub adjacent to naturally regenerating grassland	13.6	0	0	0
Mid-summer	G	Crown Wharf, western end; bracken and ephemeral vegetation	18.6	0.2	0	0.4
	H	Southern boundary of PDZ - woodland edge; ephemeral vegetation and bare ground	120.8	1	0	0.6
	I	Eastern boundary of PDZ; conifer trees (Leyland cypress) adjacent to ephemeral and gorse vegetation	185.4	1.4	0	0.2
Late summer	K	Crown Wharf – eastern end; scattered broadleaved tree located on the dockside	48.8	24.4	0	3
	L	North-western part of PDZ; scrub woodland on the northern boundary	19.6	1.6	0	0.6

Average number of passes per night	**58.82**	**4.09**	**0.03**	**1.22**

* Detector A recorded only noise throughout the survey duration due to the proximity of the detector to the unnamed port road

3.2.6 Detectors were placed out in two locations in Temporary Construction Area 1 for the duration of the mid summer transect to provide point count data over the entire survey visit. A 5-day period of remote recording was undertaken in late summer.

3.2.7 The results of the remote recording indicate that levels of bat activity in this location are typically low but there is some variation. Common pipistrelle foraging activity was recorded around the scattered scrub in the eastern part in mid summer with 63 calls detected during the overnight recording period. In comparison, an average of less than 8 calls per night were detected in the same location during the 5-day recording period in late summer.

3.2.8 A low level of noctule bat activity was also noted on the remote detector in Temporary Construction Area 1 in late summer with an average of 5 calls per night and in Temporary Construction Area 2, adjacent to the railway line and extensive reedbed. The distribution of the calls over the night indicates a small number of bats commuting over the site.

Table 3.3: Bat activity levels recorded on remote detectors in Temporary Construction Areas

Detector ID	Habitat location	Average passes per night over 5 day recording period			
		Common pipistrelle	Soprano pipistrelle	Nathusius pipistrelle	Noctule
Temporary Construction Area 2 (D) – overnight mid summer	Southern boundary of scrub woodland (north of the disused railway line)	5	1	0	2
Temporary Construction Area 1 (E) – overnight mid summer	Bramble and scattered scrub on eastern side of area	63	1	0	0
Temporary Construction Area 1 (F) – overnight mid summer	Sparsely vegetated bare ground and scattered scrub	5	0	0	0
Temporary Construction Area 1 (J) – 5 days recording late summer	Scrub adjacent to Margam Wharf dockside	7.8	0.6	0.2	5.8

3.3 Bat Species Distribution

Common Pipistrelle

3.3.1 Common pipistrelle was the most frequently encountered species during all surveys carried out making 92.72% of calls recorded during the static recording and transect surveys. Calls from common pipistrelle were recorded on all static detectors and on all three transect surveys.

3.3.2 The highest levels activity common pipistrelle activity was recorded on the eastern side of PDZ with foraging and commuting behaviour recorded in the north-eastern part of PDZ with social calling behaviour also recorded. This area comprises scrub edge, open grassland, bramble and gorse scrub. The highest number of bat passes was recorded on the remote detector deployed on the eastern boundary where it was situated in a location where there are extended periods of foraging.

3.3.3 Common pipistrelle foraging activity was also observed alongside Phoenix Way between the Crown Wharf and the PDZ during the mid-summer transect survey. Individual common pipistrelle were seen foraging up and down the road, with multiple bats observed foraging around streetlights close to the lay-by on the northern boundary of the PDZ.

3.3.4 More frequent common pipistrelle activity was also noted on the remote detector placed on the edge of the scrub woodland southern boundary of the PDZ. During the transects/point counts, commuting bat passes were generally only rarely recorded in this location with the observed bats generally flying from west to east.

3.3.5 The results suggest the linear woodland feature as a commuting route with variation in the level of use between nights, influenced by environmental conditions such as stronger winds with the trees creating more sheltered conditions. A similar result was obtained for Temporary Construction Area 1 with no activity during the transects, and typically very low levels of per night but with higher levels of activity recorded overnight in mid summer.

3.3.6 Very low levels of activity were recorded during transects and on the remote recorder in Temporary Construction Area 2.

Soprano Pipistrelle

3.3.7 Soprano pipistrelle was the second most recorded species on the static detectors; accounting for 6% of all the recorded bat activity. Soprano pipistrelle calls were recorded in low number on all the remote detectors placed out in mid and late summer, but typically with an average of less than 2 passes were detected per night.

3.3.8 In comparison, there were no detections in spring when the remote detectors were placed in the western and southern parts of the PDZ.

3.3.9 Soprano pipistrelle activity was much lower than common pipistrelle, but activity was regularly recorded on detectors placed in the northern boundary of PDZ.

3.3.10 Notably higher levels of soprano pipistrelle were detected on the remote detectors deployed in Crown Wharf (close to the open water dock) in late summer with an average of 24 passes per night. The recordings included social calling and indicated the presence of more than one bat.

Noctule

3.3.11 Noctule were recorded occasionally throughout the site and was the third most common species with 1.1% of the total calls recorded during the remote recording surveys.

3.3.12 Occasional noctule passes were recorded on detectors placed in the Temporary Construction Areas 1 and 2 with a maximum average of under 6 passes per night. Low level noctule commuting activity was recorded on the detector placed close to the open water dock in Temporary Construction Area 1 in late summer (detector 'J'). Noctule bats call were also recorded on Crown Wharf (detector 'K') at the same time. Noctule bats commuting over the dock could have been recorded on both detectors.

Nathusius' Pipistrelle

3.3.13 A single Nathusius' pipistrelle pass was recorded on the remote detector in the western part of the PDZ in late May. The detector was placed on the edge of scrub woodland adjoining the extensive stands of Japanese knotweed.

3.3.14 No Nathusius' pipistrelle bat activity was detected during any of the transect surveys.

4 REPTILE SURVEY RESULTS

Overall Distribution

4.1.1 The survey confirmed the presence of three reptile species within the survey area. Common lizard was the most frequently recorded species with smaller numbers of slow worm and grass snake. The results of the surveys are described below with the survey results presented in the Tables 4.1, 4.2 and 4.3.

4.1.2 The results of the reptile survey are presented in the context of different sections of the survey area; PDZ, Crown Wharf, and Temporary Construction Areas. The railway sidings was also included in the reptile survey. This was sub-divided into the western section which is a wide expanse of open ground with scattered shrubs, and the narrower eastern section where there are adjoining areas of grassland and scrub close to the line.

Common lizard

4.1.3 A common lizard population was primarily recorded in the PDZ with a peak count of 18 adults was recorded in late September. The PDZ is associated with the most optimal habitat for this species, with parts of the habitat comprising grassland, bramble, gorse, and bracken providing sheltered basking opportunities close to cover. Only a single common lizard was recorded in Crown Wharf on one occasion.

4.1.4 Temporary Construction Area 2 had confirmed presence of both adults and juveniles. The peak of one was recorded on four of the eight survey visits.

4.1.5 Most of this area is heavily shaded and has very low suitability for common lizard, but the south-eastern corner includes small areas of grassland and ephemeral vegetation. Based on habitat extent the potential carrying capacity of this area will be low.

4.1.6 No common lizards were found on the railway sidings, which comprised large expanses of bare ground and ephemeral vegetation, or in Temporary Construction Area 1 which generally lacks areas of cover.

Table 4.1: Common lizard survey results

Date	PDZ	Railway Sidings East	Railway sidings West	Temporary Construction Area 2	Temporary Construction Area 1	Crown Wharf
31/08/2022	1 adult, 1 juvenile	-	-	0	0	0
13/09/2022	12 adults, 1 juvenile	-	-	1 adult	0	0
15/09/2022	8 adults, 1 juvenile	-	-	0	0	0
16/09/2022	9 adults	-	-	1 adult, 1 juvenile	0	0
20/09/2022	4 adults, 1 juvenile	-	-	1 adult	0	-
22/09/2022	7 adults, 4 juveniles	0	0	0	0	0
26/09/2022	2 adults, 1 juvenile	-	-	-	-	0
28/09/2022	18 adults. 6 juveniles	0	0	1 adult	0	0
06/10/2022	1 adult, 1 juvenile	0	0	0	0	-

11/10/2022	1 adult	0	0	-	-	1 adult
13/10/2022	-	0	0	-	-	-
18/10/2022	-	0	0	-	-	-
20/10/2022	-	0	0	-	-	-

Slow worm

4.1.7 The survey confirmed the presence of slow worm in the PDZ, in grassland alongside the railway sidings (eastern end) and in Temporary Construction Area 2. No slow worm were recorded in Temporary Construction Area 1 or at Crown Wharf.

4.1.8 There was a peak count of two in the PDZ across the survey visits with the individuals found on the edges of scrub woodland towards the boundaries of the survey area. The PDZ has suitable habitat for slow worm with open areas of grassland and in particular the grassland areas between densely shaded areas of willow scrub in the PDZ including the southern edge at the base of the railway embankment. There are also a few small areas of open grassland within dense stands of Japanese knotweed.

4.1.9 Small numbers of adults and sub-adults were recorded in Temporary Construction Area 2. The extent of optimal habitat is limited to the southern boundary and south-eastern corner with the closed canopy woodland being sub-optimal habitat.

4.1.10 South of the railway sidings is a north-facing grassland bank with linear woodland at the top. A single slow worm was recorded on a south-facing grass bank on the far side of the woodland.

4.1.11 No slow worms were recorded in habitats adjoining the disused railway lines in the western section of the sidings, where the scattered scrub and sparse ground cover provided fewer opportunities for this species.

4.1.12 A small area of scrub and grassland and scrub adjoining the sidings to the south-east was a further location where adult and a single juvenile slow worm were recorded.

Table 4.2: Slow worm survey results

Date	PDZ	Railway Sidings East	Railway sidings West	Temporary Construction Area 2	Temporary Construction Area 1	Crown Wharf
31/08/2022	0	-	-	0	0	0
13/09/2022	0	-	-	0	0	0
15/09/2022	1 sub-adult	-	-	1 sub-adult	0	0
16/09/2022	0	-	-	1 sub-adult	0	0
20/09/2022	2 adults	-	-	0	0	-
22/09/2022	0	2 adults	0	2 sub adults	0	0
26/09/2022	0	-	-	-	-	0
28/09/2022	0	0	0	0	0	0
06/10/2022	1 adult	1 juvenile	0	0	0	-
11/10/2022	0	0	0	-	-	0

13/10/2022	-	1 adult	0	-	-	-
18/10/2022	-	0	0	-	-	-
20/10/2022	-	0	0	-	-	-

Grass snake

4.1.13 Adult, sub-adult and juvenile grass snakes were recorded during the survey being recorded in four of the six survey areas.

4.1.14 In the PDZ, grass snakes were found on four occasions, predominately under mats in the grassland areas. Suitable grass snake habitat is present across the PDZ with the reedbed areas a potential source of amphibian prey. Two different adults were recorded in the PDZ on two separate occasions. A juvenile was recorded in the PDZ on one occasion, late in season mid October at a time when they will be moving towards hibernation sites. Juvenile and sub-adult grass snake was also found at Crown Wharf, in late September and October.

4.1.15 Individual sub-adult grass snake were also recorded in Temporary Construction Area 2, Crown Wharf and in habitats alongside the railway sidings (east).

Table 4.3: Grass snake survey results

Date	PDZ	Railway Sidings East	Railway sidings West	Temporary Construction Area 2	Temporary Construction Area 1	Crown Wharf
31/08/2022	0	-	-	0	0	0
13/09/2022	0	-	-	0	0	0
15/09/2022	2 adults	-	-	0	0	0
16/09/2022	1 adult	-	-	1 sub-adult	0	0
20/09/2022	0	-	-	0	0	-
22/09/2022	0	1 sub-adult	0	0	0	1 juvenile
26/09/2022	0	-	-	-	-	0
28/09/2022	2 adults	0	0	0	0	1 juvenile
06/10/2022	0	1 sub-adult	0	0	0	-
11/10/2022	0	0	0	-	-	1 sub-adult
13/10/2022	1 juvenile	0	0	-	-	-
18/10/2022	-	0	0	-	-	-
20/10/2022	-	0	0	-	-	-

5 BADGER AND OTTER SURVEY RESULTS

5.1 Badger

5.1.1 No fields signs across the survey area.

5.1.2 The habitats within each part of the site are sub-optimal for the establishment of setts because of the post-industrial nature of the site and underlying substrate.

5.1.3 In addition, the extensive regenerating scrub woodland has a very open ground flora and lacks dense cover.

5.1.4 In comparison to more natural soil conditions, the dry, stony ground would make excavation of below ground chambers difficult. Any chamber created in friable substrate would be liable to collapse.

5.1.5 Soil invertebrates including earthworms which form an important food resource for badger during part of the year would not be expected to be present in abundance within the post-industrial substrate.

5.1.6 The absence of field signs of badger activity in each area of the site indicates that this species is not resident in the site.

5.1.7 The wider Harbourside site, as a whole, has a high degree of isolation for badgers created by the coast, the open water dock and River Afan and Tata Steel steelworks. Features along which badger could colonise the site would be restricted to the disused railway line forming a partially vegetated corridor through the Tata Steel steelworks.

5.1.8 Although badgers occur very widely the absence of activity within the site is unsurprising given the degree to which the site is isolated from habitats of potential value for badges in the wider landscape.

5.2 Otter

Habitat Assessment

5.2.1 There have been several past sightings of otter from the River Afan indicating that the tidal section of this watercourse falls within the territory of an otter.

5.2.2 Otters typically have an extensive home range, and the open water dock would be easily accessible to otter from the river. Based on the presumed presence of prey populations in the open water dock is likely to be a habitat used by foraging otters.

5.2.3 Parts of the survey area are located in proximity to the open water dock and potential for terrestrial habitats to be used as resting places have been assessed; specifically Temporary Construction Area 2, comprising dense scrub woodland adjoining an extensive reedbed; and in parts of the PDZ where willow scrub adjoins stands of seasonally wet reedbed.

5.2.4 The scrub woodland in Temporary Construction Area 2, adjoining an extensive 1ha reedbed is considered to have the potential to be used by otter with the possible presence of prey species and areas of cover in the vicinity of the dock. Further otter survey has been carried out in these habitats. Parts of scrub woodland adjoining stands of reed in the PDZ have also been subject to walkover surveys to assess their use by otter.

5.2.5 The other areas within the Survey area classified as having negligible or very low potential value as daytime places of shelter.

5.2.6 Temporary Construction Area 1 is sparsely vegetated ground with minimal areas of dense shelter. The disused railway sidings / railway line also have limited extents of dense cover and are

significant distance from the open water dock. The strip of dense bracken and bramble at Crown Wharf is a 15m wide strip of dense herbaceous cover but is bounded by Phoenix Way. The road is very frequently trafficked by heavy goods vehicles throughout daytime hours and the noise and vibration from the port traffic makes this area unlikely to be used.

Walkover Surveys

5.2.7 In Temporary Construction Area 2, the edge of the scrub woodland, areas of bramble thicket and accessible margins of the reedbed were subject to systematic searches for signs of regularly used mammal paths in September, October and November.

5.2.8 The scrub woodland comprises multi-stemmed willow shrubs with a field layer of open bramble vegetation. Areas of dense cover at ground level are limited to localised areas of bramble thicket. A clear mammal path was noted through the scrub woodland close to the northern boundary but did not lead into the reedbed. No other signs of activity that could relate to otters was observed during any of the walkover surveys.

5.2.9 The scrub around the stands of reed are located less than 50m from the edge of the open water dock. Transects through the scrub woodland and around the margin of the reedbed found one clear (non-rabbit) mammal paths leading from northern boundary into the PDZ.

5.2.10 Areas of dense cover with potential to be used as a laying up place were very limited. The scrub around the reed comprises multi-stemmed shrub willows with a sparse vegetation cover at ground level.

Trial Camera Remote Recording

5.2.11 The well-used mammal paths were inspected in the PDZ, but none were found in the south by the railway sidings. The mammal path in Temporary Construction Area 2 was covered by a trial camara for multiple weeks between September and November. The path was solely used by foxes over this three month period. The mammal path on the northern boundary of the PDZ was covered by a trail camara throughout October and December. Foxes and rabbits were the recorded using the path during this period.

6 GREAT CRESTED NEWTS

Habitat Assessment

6.1.1 There are four areas of at least seasonal open water within the Tata Steel steelworks to the south of the survey area as shown on Drawing 7 (ECO02340-0010). Descriptions and photographs of the waterbodies are presented in Appendix A.

6.1.2 W1 is an area of shallow seasonal pooling on an operational coal stockyard located 260m from the boundary of the PDZ.

6.1.3 W2 is a small area of shallow open water on the margin of an iron ore stockyard bounded a small area of grassland. The pond is located 256m from the boundary of the PDZ and is separated from it by large stockpiles and the railway sidings.

6.1.4 The two other ponds are located further from the development; W3 is equivalent to W1 a location where there is seasonal pooling in a low-lying part of an active operational yard. W4 is a site drainage ditch and holds rainwater and run-off from the blast-furnace slurry stocking area. Both W3 and W4 are located over 500m from the boundary of the PDZ.

7 DISCUSSION

7.1 Bats

7.1.1 Four species of bat were recorded in total (combined remote recording and transect surveys); common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle and noctule.

7.1.2 A very high proportion of the recorded activity related to common pipistrelle, including foraging and social calling behaviour. The overall level of activity is generally low with localised areas of more regular foraging.

7.1.3 The north-eastern section of the PDZ was the most frequently used area with the streetlights along Phoenix Way potentially attracting insect prey. The southern boundary of the PDZ adjoining the railway sidings subject to a variable level of use and is a flight line used by this species.

7.1.4 The results suggest soprano pipistrelle generally occurs in very small numbers within the site; associated with scrub edge habitats including the margin of the dock at Crown Wharf. In comparison the continuous scrub and extensive stands of Japanese knotweed in the PDZ were associated with very low levels of bat activity.

7.1.5 Overall, it is considered that the northern and eastern boundaries of PDZ form a continuous feature which is an important foraging site for the local common pipistrelle population. Although there are significantly lower levels of soprano pipistrelle, the variation in activity indicates that the survey area has some value for the local population. Both species are common and will be widespread in the local area but are listed as S7 Species of Principal Importance in Wales.

7.1.6 Across all the remote recording, a single Nathusius' pipistrelle pass was recorded on the western boundary of the PDZ. Nathusius' pipistrelle activity was also detected in adjacent habitats to the west of the PDZ during the surveys in the wider docks in 2021.

7.1.7 Nathusius' pipistrelle is classified as vulnerable in Wales and as a near threatened species in England and the UK. The Harbourside site, as a whole, has importance for in a local context with a known roost in the local area beyond 2km from the site.

7.1.8 The detections of noctule bat were typically periodic, indicative of bats commuting over of the site; A small proportion of the recorded activity had high repetition call rates indicative of brief periods of foraging. The low number of noctule calls over the recording periods indicates that habitats within the site are not frequently used by foraging noctule bats. Overall the site is considered to have value for noctule providing flight lines within an industrial and urban environment.

7.1.9 The level of noctule activity was consistent with assessment of the adjoining land parcels in summer 2021 and the site forms a small part of area used by this species.

7.1.10 Overall the assemblage of bat species and levels of activity have importance in the context of the site and immediate surroundings.

7.2 Reptile Species

7.2.1 Populations of three native reptile species, slow worm, grass snake and common lizard, occur within the survey area.

7.2.2 Based on a peak count of 18 adults, the PDZ supports a good population common lizard while Temporary Construction Area 2 supports a small population. The largest population of common lizard were found in the PDZ with almost all juveniles found in open grassland on the eastern side of this area. The common lizard population within the PDZ is one of a series of populations present in the wider Harbourside site.

7.2.3 Slow worm is also resident in the PDZ and in the adjoining scrub woodland outside of the site. The limited number of findings and low peak counts indicates that the population within this part of

the survey area is likely to be small. Based on the extent of suitable habitat the PDZ has the potential to support a good population. Slow worm has been found in higher numbers in scrub habitats to the west of the PDZ, where rank grassland and scrub are present alongside scrub woodland and the ground is much more undulating with various banks providing more opportunities for cover and shelter.

7.2.4 The survey has confirmed the presence of a breeding grass snake population within the PDZ and Crown Wharf. The areas of seasonally dry reedbed and unmanaged bracken create conditions in which eggs could be laid. Individuals recorded within the survey areas will form part of wider grass snake population with adults and sub-adults also recorded in the former mineral extraction 600m to the west of the PDZ. The 1ha reedbed and surrounding scrub habitats are likely to have importance for grass snake, which will feed on common amphibian species.

7.2.5 With all three species considered resident, they will each hibernate within or close to the PDZ. This area is largely flat with only minor surface undulations and lacks extensive banks. Features with potential value for hibernation include rabbit warrens, localised sections of banks, exposed tree roots and small mammal burrows. Parts of the PDZ have a sandy substrate and are associated with extensive rabbit warrens, most notably in the eastern and north-western parts, but rabbit burrows and other small mammal holes are widely distributed across the PDZ. Localised areas of ground are subject to a degree of waterlogging and will be unsuitable for hibernation.

7.2.6 Outside of the PDZ and adjacent Crown Wharf, small numbers of all three species were found in Temporary Construction Area 2. Due to the small size of the suitable reptile habitat in this area, it is likely to be part of more extensive habitats supporting the reptile populations.

7.2.7 The ballast substrate with colonising butterfly bush, present across the main part of the sidings, has a generally sparse vegetation cover limiting its potential value, but grass snake and slow worm were found in small numbers in grassland set back from the railway tracks and ballast.

7.2.1 Reptiles are very likely to be absent from Temporary Construction Area 1, which is enclosed by the open water dock, frequently trafficked port roads and large industrial operations. The sparser vegetation cover with only isolated areas of longer grass means that this area has significantly lower potential value for reptiles compared to the PDZ and Temporary Construction Area 2.

7.3 Badgers

7.3.1 The survey results indicate the absence of badger setts from the PDZ, Temporary Construction Areas and sidings. With no signs of foraging or dung pits it is also highly likely that these are located outside of an active badger territory.

7.4 Otters

7.4.1 Otters are a wider ranging species with a known population on the River Afan. It is likely that otters will regularly move along the tidal section of the river and may enter the open water dock. No potential laying up places or holts have been found in the survey area. There are no features within the site considered to be important to the otter population on the River Afan.

7.5 Great Crested Newts

7.5.1 The shallow areas of pooled water in the operational yards located between 250m and 300m from the PDZ have very low potential value as a habitat for great crested newts.

7.5.2 The majority of individuals within a great crested newt breeding population will occur in terrestrial habitats located in a 50m zone around the waterbody and the Tata Steel operational areas create significant barriers to movement between waterbodies and the proposed development areas.

7.5.3 If any of the waterbodies supported a breeding population, given the distances of waterbodies from the development and the degree of separation, there is negligible potential for individual great crested newts to utilise habitats within the PDZ.

7.5.4 Temporary Construction Area 2 lies within 90m of one of the seasonal waterbodies. In the very unlikely event that the pooling in the operational coal stockyard supports a GCN breeding population there is a low likelihood of individuals utilising habitats within this part of the survey area.

8 CONCLUSIONS

8.1 Bats

8.1.1 Overall the habitats within the site have relatively low value for bats supporting a small assemblage of species. None of the shrubs within the scrub woodland had the potential to support roosting bats. An open sided car port adjoining the eastern boundary had negligible potential value for bats.

8.1.2 Common pipistrelle was the only bat species to consistently forage in localised areas within the site. Soprano pipistrelle are generally only present in very small numbers with very little evidence of extended foraging activity indicating it is primarily a commuting route. Noctule bats generally commute over the docks / disused railway line but occasionally forage within the site. Nathusius pipistrelle is a very occasional visitor. The level of activity and species assemblage is consistent with the findings of bat surveys undertaken for the adjoining post-industrial land within the dock; with generally very low levels of activity and more localised areas where small numbers of bats regularly forage.

8.2 Reptiles

8.2.1 Resident breeding populations of three reptile species are present within the survey area, but with no reptiles recorded in Temporary Construction Area 1 or the ballast habitats in the centre of the sidings.

8.2.2 The common lizard population is primarily associated in grassland in PDZ with further populations associated with grassland habitats across the wider docks. Slow worm was recorded in small numbers in the PDZ with a larger population in mixed scrub habitats and grassland outside the survey area to the west of the PDZ and was also recorded in Temporary Construction Area 2.

8.2.3 A grass snake population is resident in docks with sightings within the survey area and past records from the former mineral extraction. The regular sightings and the presence of sub-adults and juveniles indicates that the PDZ is an important habitat for this species. In terms of the potential value of habitats the 1ha reedbed to the east of the PDZ is expected to a key feature for this species.

8.3 Badger

8.3.1 This species is considered to be absent from the survey area.

8.4 Otter

8.4.1 The use of the wider dock by otter cannot be precluded. With the close proximity to the River Afan, otter would likely traverse the docks and in particular the reedbed on the northern edge of the docks. The camera traps deployed over the survey period didn't confirm the presence of otters in the dock or within the PDZ.

8.4.2 Terrestrial habitat across the PDZ is limited with a lack of dense vegetation cover with patchy, open structured grassland and Japanese knotweed stands. It is unlikely with the lack of available habitat in the PDZ, lack of evidence of otter field signs and camera trap results that otter use the PDZ.

8.5 Great Crested Newts

8.5.1 The closest past record of great crested newt to the survey area is from a waterbody 1.2km to the south, within Tata Steelworks. Closest waterbodies to the site are seasonal and unvegetated, located within actively trafficked operational areas. They have very poor suitability for great crested newts and there is poor terrestrial habitat connectivity between the ponds and the survey area. It is concluded that there is negligible potential for individual great crested newts to utilise habitats within the PDZ. Terrestrial habitats in Temporary Construction Area 2 would have the potential to be used by great crested newts if breeding in the seasonal waterbody that forms in a heavily trafficked operational yard.

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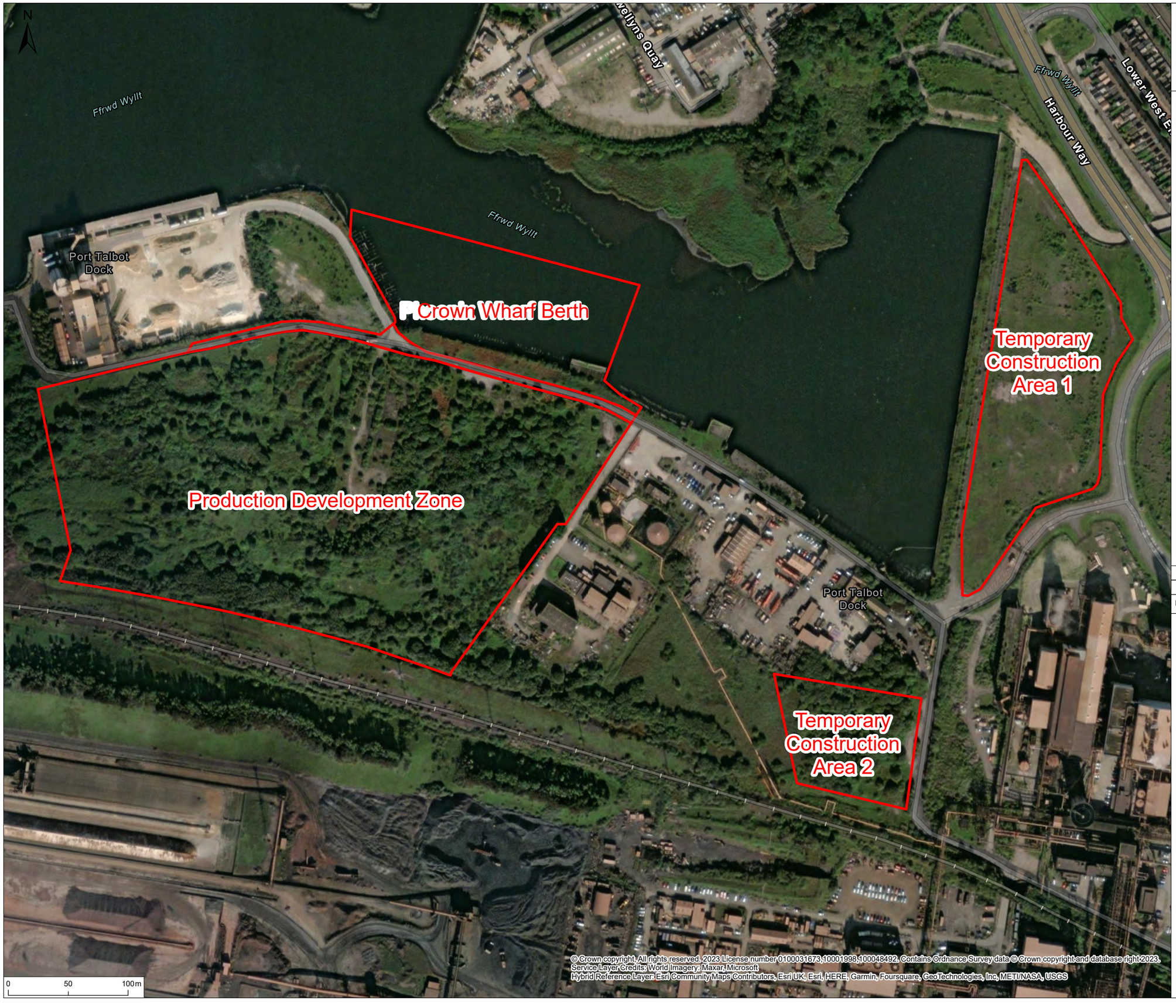
DRAWINGS

Drawing 1	**Survey Areas**
Drawing 2	**Remote Static Detector Locations**
Drawing 3	**Bat Transects and Activity**
Drawing 4	**Bat Transect Density Maps**
Drawing 5	**Reptile Refuge Location Plan**
Drawing 6	**Reptile Results Plan**
Drawing 7	**Waterbody Location Plan**



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Legend

Site Boundaries

Rev	Description	By	CB	Date

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Client: LanzaTech

Project: Project Dragon

Title: Survey Areas

Status	Drawn By	PM/Checked By
ISSUE	OW	TO
Project Number	**Scale @ A3**	**Date Created**
ECO02340	1:3,000	MAR 2023
Figure Number		**Rev**
1		-

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Legend

- Site Boundaries

Bat Statics

- Spring
- Mid-summer
- Late-summer
- Temporary

Rev	Description	By	CB	Date

MAKING COMPLEX EASY

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Project: Project Dragon

Title: Bat Static Detector Locations

Status	Drawn By	PM/Checked By
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Project Number	**Scale @ A3**	**Date Created**
ECO02340	1:5,000	MAR 2023
Figure Number		**Rev**
2		1

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Legend

- Site Boundaries
- Bat Transect Route
- Transect Points

Bat Transect Results

- Nyctalus noctula
- Pipistrellus pygmaeus
- Pipistrellus pipistrellus

Rev	Description	By	CB	Date

MAKING COMPLEX EASY

20 Western Avenue, Milton Park, Abingdon, Oxfordshire, OX14 4SH
T: +44(0)1235 821 888 E: rpsox@rpsgroup.com

Client: LanzaTech

Project: Project Dragon

Title: Bat Activity

Status	Drawn By	PM/Checked By
ISSUE	HM	TO
Project Number	**Scale @ A3**	**Date Created**
ECO02340	1:3,000	MAR 2023
Figure Number		**Rev**
3		**1**

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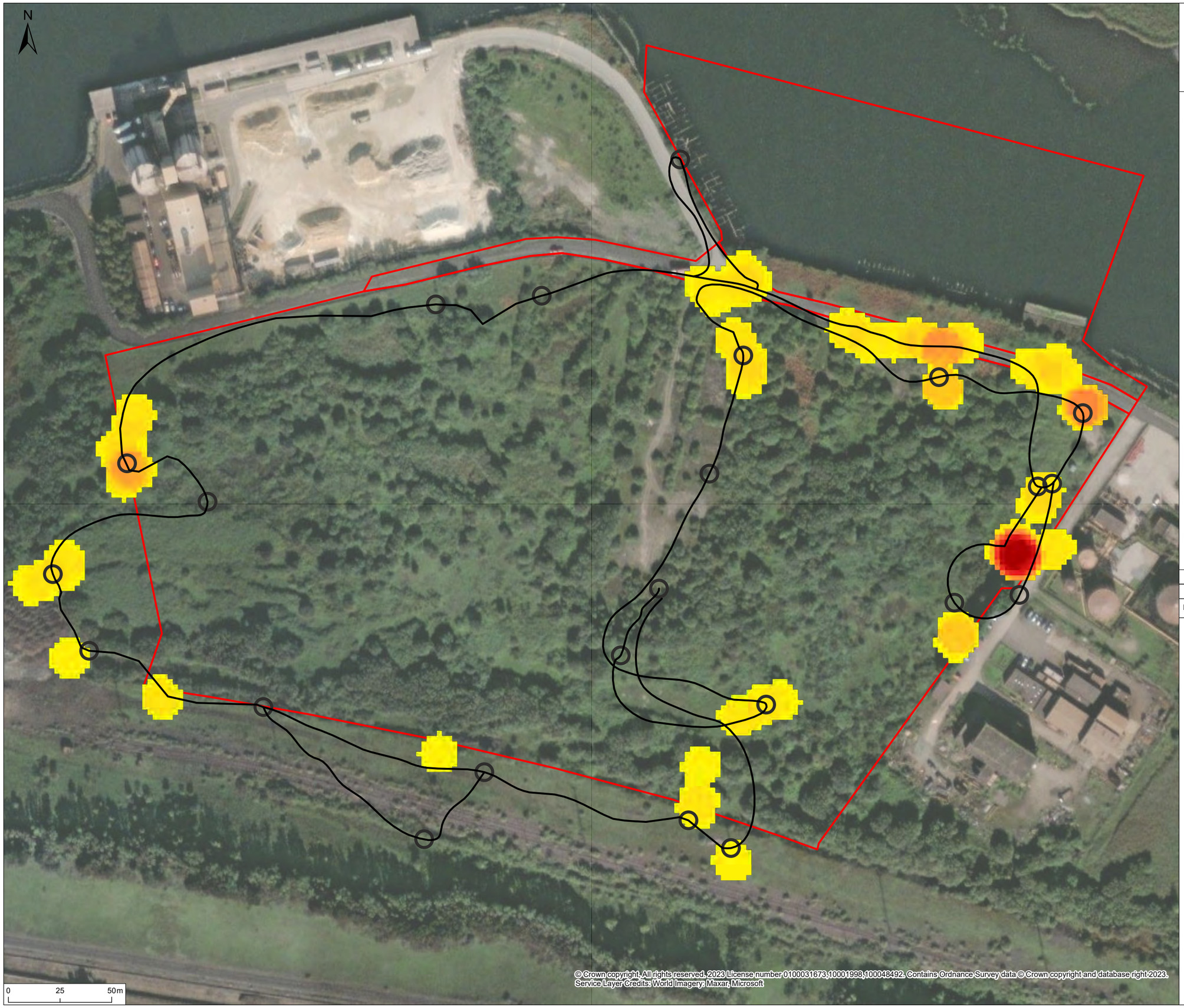

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Legend

- Site Boundaries
- Bat Transect Route
- Transect Points

Rev	Description	By	CB	Date

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20 Western Avenue, Milton Park, Abingdon, Oxfordshire, OX14 4SH
T: +44(0)1235 821 888 E: rpsox@rpsgroup.com

Client: LanzaTech

Project: Project Dragon

Title: Bat activity heat map - PDZ

Status	Drawn By	PM/Checked By
ISSUE	HM	TO
Project Number	**Scale @ A3**	**Date Created**
ECO02340	1:1,750	MAR 2023
Figure Number		**Rev**
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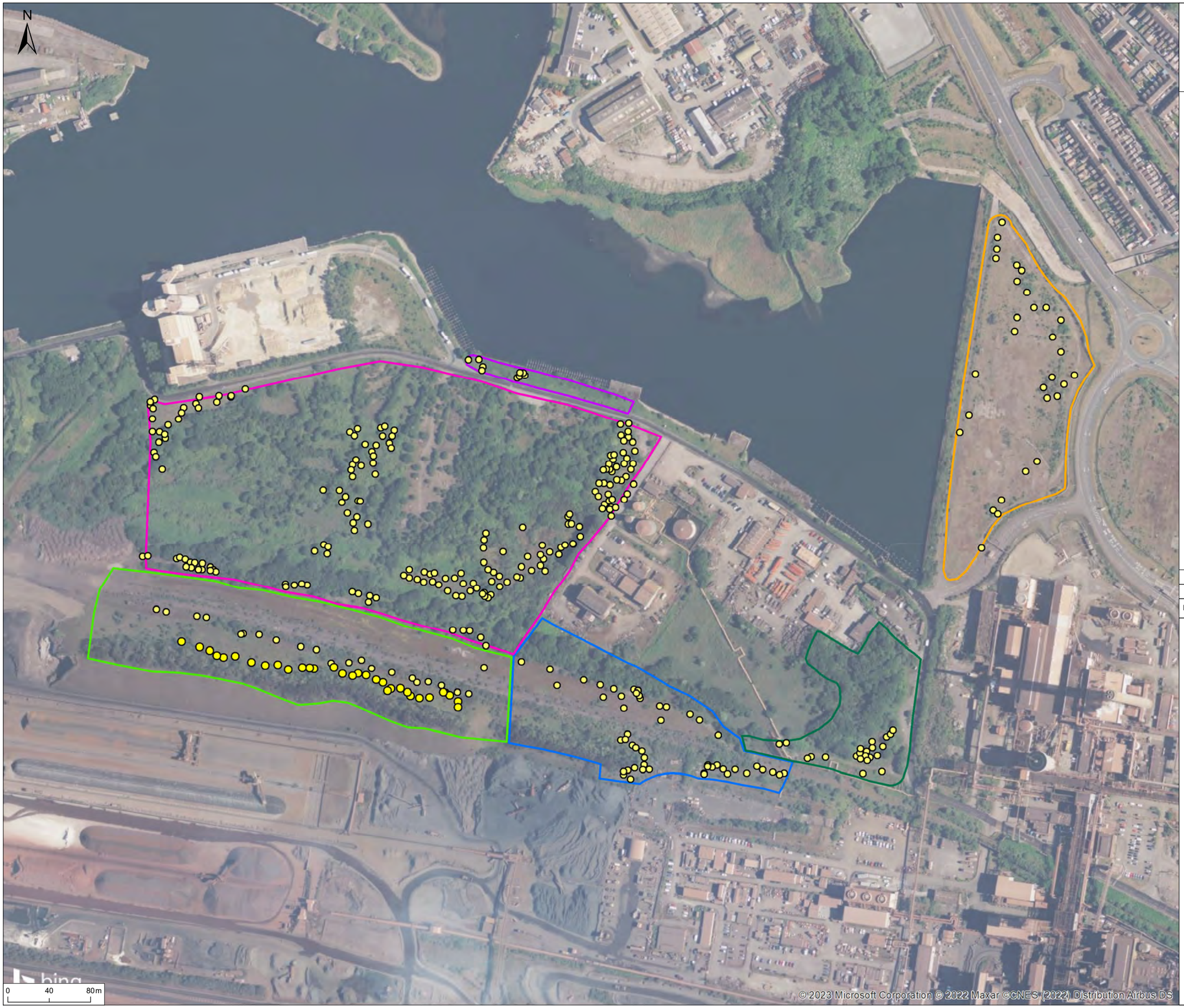

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Legend

Reptile refugia plan

- Laydown Area 1
- Laydown area 2
- PDZ
- Phoenix Wharf
- Railway Sidings East
- Railway Sidings West
- Set out reptile sheets

Rev	Description	By	CB	Date

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Atholl Exchange, 1st Floor, 6 Canning Street, Edinburgh EH3 8EG
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Client: LanzaTech

Project: Project Dragon

Title: Reptile Refuge Mats

Status	Drawn By	PM/Checked By
ISSUE	DGH	-
Project Number	**Scale @ A3**	**Date Created**
ECO02340	1:3,500	MAR 2023
Figure Number		**Rev**
5		**-**

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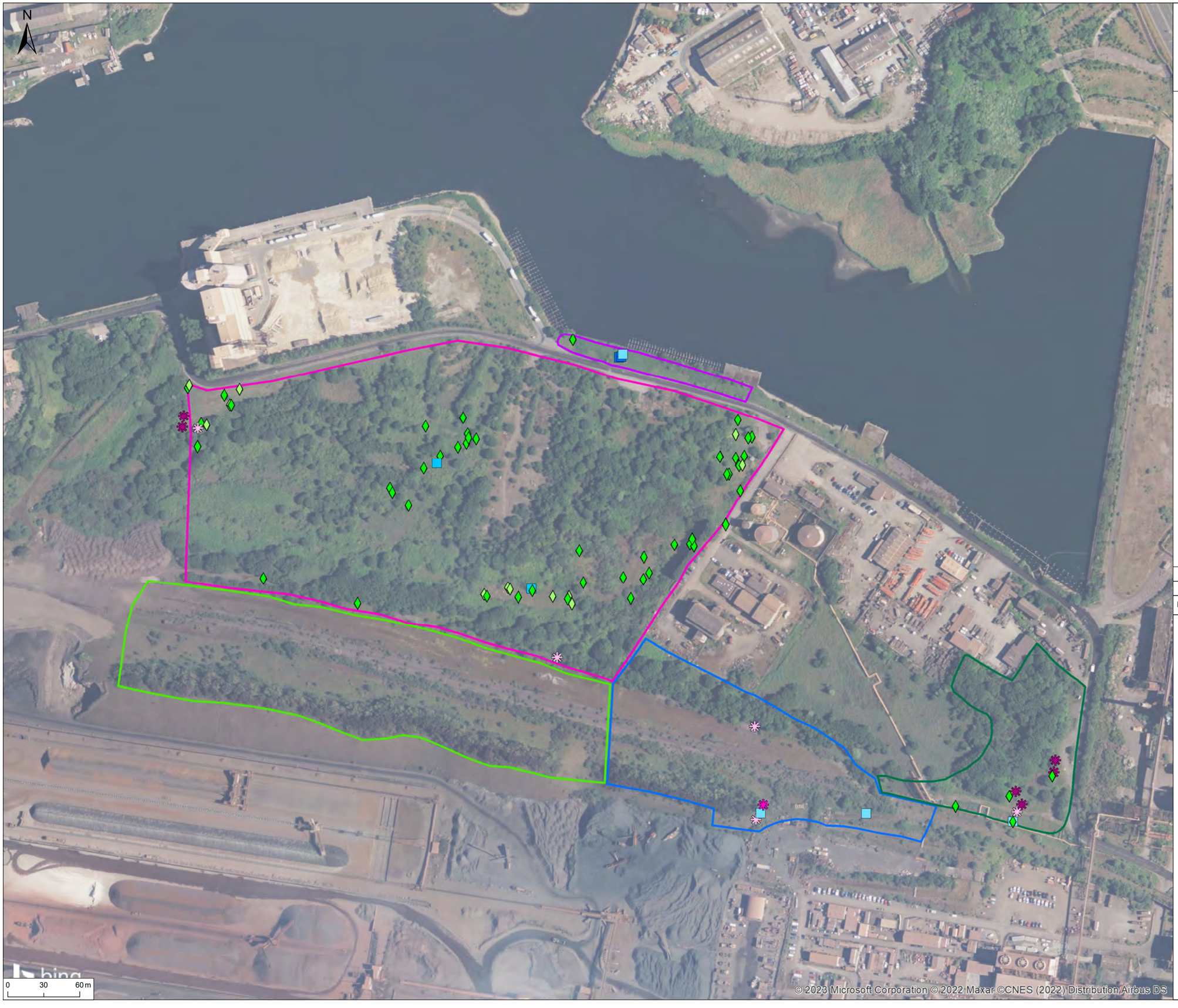
W:_GIS_OtherOfficeWork\ECO02340 Project Dragon\Tech\Drawings\ECO02340-0001-01 Reptile refugia plan.mxd



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Legend

Reptile refugia plan

- Laydown Area 1
- PDZ
- Phoenix Wharf
- Railway Sidings East
- Railway Sidings West

Reptiles observed

- Common lizard, Adult
- Common lizard, Juvenile
- Grass snake, Adult
- Grass snake, Juvenile
- Grass snake, Sub-adult
- Slow worm, Adult
- Slow worm, Juvenile
- Slow worm, Sub-adult

Rev	Description	By	CB	Date

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Atholl Exchange, 1st Floor, 6 Canning Street, Edinburgh EH3 8EG
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Client: LanzaTech

Project: Project Dragon

Title: Reptile Results

Status	Drawn By	PM/Checked By
DRAFT	DGH	AH
Project Number	**Scale @ A3**	**Date Created**
ECO02340	1:3,000	MAR 2023
Figure Number		**Rev**
6		**-**

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Legend

Site Boundary

W Pond ID
PDZ: Distance to Production Development Zone

Rev	Description	By	CB	Date

MAKING COMPLEX EASY

20 Western Avenue, Milton Park, Abingdon, Oxfordshire, OX14 4SH
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Client LanzaTech

Project Project Dragon

Title Pond Location and Distance

Status	Drawn By	PM/Checked By
ISSUE	HM	TO
Project Number	**Scale @ A3**	**Date Created**
ECO02340	1:6,000	FEB 2023
Figure Number		**Rev**
7		1

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APPENDICES

Appendix A

Waterbody Descriptions

Pond ID	Photo	Description
W1	 	Standing surface water in raw materials storage area. Permanence: Temporary pooling during heavy rainfall. Water quality: Low and it is highly trafficked area. Depth in winter: 2-5cm maximum depth
W2	 	Standing surface water on the margin of a raw materials storage area. Permanence: Dries out in summer months but less transient than W1 Water quality: likely to be contaminated with iron ore stocks. Depth in winter: 2-5cm maximum

Pond ID	Photo	Description
W3		Standing surface water in raw materials storage area. Highly trafficked area meaning that it could not be safely photographed Permanence: Seasonal pooling during heavy rainfall equivalent to W1 Water quality: Low with the waterbody located in a highly trafficked area. Depth: 2-5cm maximum
W4		Forms part of the site drainage and is pumped into sump 1 near the sinter plant, predominantly formed from rainwater and run-off from the blast-furnace slurry stocking area. Fully enclosed by active operational areas and barriers to the migration. The sinter plant (RHS of photograph) lies to the north of the waterbody. Permanence: Will hold water throughout the year. Water quality: Likely to be poor Depth: 1m maximum

Annex C

Bryophyte Assessment

BREEDING AND OVERWINTERING BIRDS REPORT

Project Dragon, Port Talbot Docks

ECO02340
1

August 2023

rpsgroup.com

Document status

Version	Revision	Authored by	Reviewed by	Approved by	Review date
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Approval for issue

Tim Oliver 11 August 2023

File Name

230623 ECO02340 Project Dragon - BBS WBS Assessment Report

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Contents

Figures

Appendices

1 INTRODUCTION

1.1 Purpose and scope of this report

1.1.1 RPS was commissioned by LanzaTech UK Ltd to prepare an assessment of the overwintering and breeding bird activity on land within and adjoining the Project Dragon development.

1.1.2 This report covers wintering and breeding bird activity within the main development areas and adjoining section of the open water dock.

1.1.3 The objective of the assessment is to define the species assemblages associated with the different parts of the survey area, bring together surveys completed between 2021 and 2023 and past records of species provided by the British Trust for Ornithology (BTO).

1.1.4 Specific consideration has been given to species protected under Schedule 1 of the Wildlife and Countryside Act 1981, species of principal importance in Wales listed by Section 7 of the Environment (Wales) Act 2016, and birds of conservation concern in Wales.

1.1.5 The ornithological information presented in this report defines the baseline conditions which inform the assessment of effects within the Ecological Impact Assessment (EcIA) and the biodiversity chapter of the Environmental Statement (ES).

1.2 Study Area Location and Context

Development Areas

1.2.1 The proposed development site is located within Port Talbot Docks and comprises two permanent development areas: the Production Development Zone (PDZ), and the Marine Unloading/Loading Facility to the north of the PDZ located on the southern side of the open water dock.

1.2.2 The Marine Unloading/Loading Facility is separated from the PDZ by a section of the port road known as Phoenix Way.

1.2.3 Prior to February 2023, the PDZ supported self-sown scrub willow and extensive stands of Japanese knotweed with more localised areas of grassland, reedbed, gorse scrub, bramble, and bracken. ABP initiated works to control the Japanese knotweed in February 2023. With many of the stands overlapping the regenerating scrub, much of the willow scrub was felled to the base prior to the start of the nesting season in order to define the full extent of Japanese knotweed, which in turn has informed the strategy for control being undertaken during 2023 and into 2024.

1.2.4 The proposed development includes a Temporary Construction Area (TCA1) within part of Margam Wharf which adjoins the eastern boundary of the open water dock. TCA1 supports sparsely vegetated bare ground and short regenerating grassland with scattered scrub. Each of these areas are defined on Figure 1.

Open Water Dock

1.2.5 The open water dock is an irregularly shaped area of open water, approximately 45ha in extent. For the purposes of the survey the dock has been sub-divided into 3 main sections (Eastern, Northern, and Western) as defined on Figure 1.

- An eastern section comprises the open water dock between Crown Wharf and Margam Wharf.
- A western section comprises the south-western part of the open water to the south side of Talbot Wharf

- A northern section comprises two linear areas of open water; one between Talbot Wharf and the fishing club wharf and between this wharf and an industrial estate to the north-east.

1.2.6 A tidal gate / shipping lock defines the western end of the open water dock separating it from the intertidal section of the River Afan where areas of rocky shore, sand, and mud are exposed at low tide.

1.2.7 This section of river is designated as the Lower River Afan Estuary Site of Importance for Nature Conservation (SINC). The river flows into Swansea Bay to the north of the harbour wall and breakwaters. Residential areas of Port Talbot are located close to the river to the north and east.

2 METHODS

2.1 Desk Study

2.1.1 The Wetland Bird Survey Data (WeBS) for wintering birds in the docks area was obtained for the period August 2012 to December 2016 (the most recent WeBS data available for the open water dock). Monthly counts of species were completed for each year within this period.

2.2 Overwintering Survey – Open Water Dock

2.2.1 A wintering bird survey of the open water dock was undertaken in winter 2022/2023. The core survey area was the eastern section comprising the open water and reedbed adjacent to Crown Wharf and Margam Wharf. Sightings of wetland birds outside the core survey were also noted and mapped.

2.2.2 Each survey work was undertaken by a suitably experienced bird surveyor, over six visits (one per month) between October 2022 to March 2023 inclusive. Each survey was undertaken over a 2-hour period in the morning. The dates, times and weather conditions for each survey visit are shown in Table 2.1. The survey dates were selected to be within a few days of the standard BTO monthly WeBS counts.

2.2.3 Suitable optical equipment was used and all observed species within the survey area were recorded and mapped.

Table 2.1: Survey Dates and Conditions

Date	Times	Weather conditions			
		Wind (Beaufort)	Cloud (Oktas)	Precipitation	Temperature (°C)
10/10/2022	10:00-12:00	2	0	None	13
14/11/2022	10:00-12:00	2-3	0	None	13
12/12/2022	10:00-12:00	2-3	1	None	2
23/01/2023	09:00-11:00	0	7	None	2
09/02/2023	10:00-12:00	1	2	None	11
20/03/2023	10:00-12:00	1	4	Drizzle	10

2.2.4 With no safe access on foot alongside the edge of the dock, the surveys were conducted from several vantage points. The core survey area in the eastern section of the open water was covered from two vantage points.

2.2.5 A vantage point alongside the dock in Margam Wharf covering the open water, edge of the reedbed, and the remains of old berths on the south-eastern edge of the dock including distant views of the old berths alongside Crown Wharf.

2.2.6 The vantage point at Crown Wharf covered the open water and reedbed on the opposite bank, as well as more distant view back to Margam Wharf. The old berths were viewed from the access road running parallel to the edge of the dock.

2.2.7 A further vantage point located alongside the Phoenix Way covered the western section of the dock between Crown Wharf and the lock as well as the southern bank of Talbot Wharf.

2.2.8 Views of parts of the northern sections of the open water dock, outside the core survey area, were gained from the Crown Wharf and Margam Wharf vantage points.

2.3 Overwintering Survey – Production Development Zone

2.3.1 The wintering bird survey was based on a standard 'walkover' methodology as outlined in Gilbert et al. (1998) and Bibby et al. (2000).

2.3.2 The survey area covered the whole of the Harbourside Site. Only the results relating to the PDZ and immediately adjoining habitats are referenced in this report. The accessible parts of the PDZ were walked at a slow pace to locate and identify all individual birds. Incidental records were made of birds observed on the open water dock. All areas of the site were approached to within 100m, where possible. All species encountered within the survey area were recorded and mapped. Suitable optical equipment was used.

2.3.3 The surveys were undertaken twice monthly between November 2021 and March 2022 with the dates and conditions listed in Table 2.2.

Table 2.2: Survey Dates and Conditions

Date	Surveyor	Times	Weather Conditions			
			Wind (Beaufort)	Cloud (Oktas)	Precipitation	Temperature (°C)
09/11/2021	DS*	08:55-11:20	SW 2	8	Nil	13
19/11/2021	DS	08:45-11:10	W 1-2	7-6	Nil	11-14
02/12/2021	DS	08:25-11:15	NW 1	3-2	Nil	4-7
22/12/2021	DS	09:25-11:55	SE 3-4	7	Nil	6-7
13/01/2022	DS	09:45-12:10	NE 1-0	0	Nil	2-8
26/01/2022	DS	12:35-15:00	SW 2	7	Nil	8-9
04/02/2022	DS	09:20-11:55	W 4-5	1-2	Nil	6-7
22/02/2022	DS	09:45-12:15	W 7-5	8-6	Light rain-nil	9-11
08/03/2022	DS	09:40-11:50	SE 5-4	3-8	Nil	6-10
22/03/2022	DS	12:05-14:25	ESE-SE 3	1-0	Nil	14-15

2.3.4 Monthly survey plans have been produced showing all the species recorded on each visit and the location of the observation. Species of conservation concern are denoted on the plan

2.3.5 The data captured during the survey visits were analysed to provide an estimate of the abundance and distribution of notable species present. The importance of the wintering bird community was assessed and defined in a geographical context with reference to thresholds of national, regional, county, local and site importance.

2.4 Breeding Bird Assessment

Breeding Bird Survey - Wider Harbourside Site

2.4.1 In 2021 a breeding bird survey was completed for a 23ha survey area, which was subdivided into four separate areas based on their location, topographical features, and habitats.

2.4.2 The extent of each of the areas that comprise the Harbourside site are illustrated on Figure 8. Within the Harbourside site, Area C East, centred at the OS grid reference SS 760 886, adjoins the boundary of the PDZ.

2.4.3 The bird survey findings for the wider Harbourside site have been used to make a precautionary assessment of the potential assemblage of species using the PDZ with specific consideration given to Area C East.

2.4.4 The Harbourside survey method was based on a standard 'walkover' methodology as outlined in Gilbert et al. (1998) and Bibby et al. (2000). The site was subject to three survey visits each completed over a single morning starting within 3 hours of sunrise. On all visits, the survey areas were fully covered along with the land immediately adjoining the survey boundary. The surveyor was Tim Oliver, a suitably experienced ornithologist. The weather conditions during each of the survey visits is presented in Table 2.3.

Table 2.3 Survey dates and weather conditions

Date	Surveyor	Times	Weather Conditions			
			Visibility	Cloud (Oktas)	Precipitation	Temperature (°C)
28/05/21	TO	05:45-11:00	Moderate (overcast)	7	Occasional light drizzle	10
07/06/21	TO	06:00-11:10	Good (sunny, only high cloud)	2	Nil	14
02/07/21	TO	06:30-11:15	Good (sunny clear)	3	Nil	12

2.4.5 Suitable optical equipment was used throughout the survey visit to scan the open habitats, scrub, hedgerows and edge habitats. All species encountered (heard or observed) within the survey area were recorded and mapped. Species overflying the site were also noted.

2.4.6 Additional ad hoc observations of breeding activity were also noted during walkover surveys in summer and during works supervised by the Ecological Clerk of Works (ECoW) in March 2022. Evidence of breeding / probable breeding include singing males, alarm calling and juveniles/family groups.

2.4.7 The data captured during the three survey visits were analysed to provide an estimate of the abundance and distribution of notable species present.

2.5 Assessment Criteria

2.5.1 The importance of the species wintering and breeding within the site was assessed and defined in a geographical context with reference to thresholds of national, regional, county, local and site importance with reference to their county and national status of the bird species, including:

- Species listed under Section 7 of the Environment (Wales) Act 2016;
- Species included in the Birds of Conservation Concern (BoCC) Red and Amber Lists in Wales;
- Species occurring in nationally, regionally or locally important numbers

2.5.2 The Environment (Wales) Act 2016 list of Species of Principal Importance is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty

under Section 7 of the Act; every public authority (e.g. a local authority or local planning authority) must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity.

2.5.3 Species listed on the BoCC Red List are those that have declined in numbers by 50% over the last 25 years, those that have shown an historical population decline between 1800 and 1995 and species that are of global conservation concern. The 67 species on the Red List are of the most urgent conservation concern.

2.5.4 Species listed on the BoCC Amber List, of which there are currently 96, include those that have shown a moderate decline in numbers (25%-49%) over the last 25 years and those with total populations of less than 300 breeding pairs. Also included are those species which represent a significant proportion (greater than 20%) of the European breeding or wintering population, those for which at least 50% of the British population is limited to 10 sites or less, and those of unfavourable conservation status in Europe.

2.5.5 The remaining species are placed on the Green List, indicating that they are of low conservation priority.

2.5.6 Thresholds for national significance in terms of population size for individual species are classified as sites that regularly support >1% of the national breeding population of a species consistent with the criteria for SSSI designation.

2.5.7 A population of a species is classified as County importance if it exceeds 1% of the estimated county population. Smaller numbers of birds are classified as having importance in a local or site context. This assessment is informed by data available from the local bird group reports.

2.6 Legislation

2.6.1 All species still receive full protection through the provisions of the Wildlife and Countryside Act 1981 (as amended). A few species are also afforded special protection under Schedule 1 of the Wildlife and Countryside Act (1981) and cannot be intentionally or recklessly disturbed when nesting. Licences can be issued to visit the nests but not to allow disturbance during a development, even in circumstances where that development is fully authorised by consents such as a valid planning permission.

2.7 Survey Limitations

Open Water Dock Vantage Points

2.7.1 The edge of the open water dock cannot be safely accessed and there is limited access on foot close to its perimeter. Therefore the survey was conducted from vantage points including Margam Wharf, Crown Wharf and the southern edge of the dock further to the west. Each vantage point location was set back from the edge of the dock by at least 5m.

2.7.2 The vantage points provided good visibility of the different sections within and adjoining the development area.

2.7.3 The open water between Talbot Wharf, the Fishing Club Wharf and the north-eastern industrial estate were not comprehensively surveyed. Although these northern parts of the dock were more distant, much of the activity associated with open water areas was also visible from the vantage points.

2.7.4 Industrial operations adjoining Margam Wharf are periodically associated with high levels of noise, with the potential for this to affect bird behaviour at the eastern end of the open water dock

Production Development Zone (Wintering Birds)

2.7.5 The dense vegetation present across the PDZ in winter 2021/2022 made access difficult to remote areas and the coverage of areas will have been affected by the stands of dense Japanese knotweed and willow scrub. The area was primarily surveyed from the central hardstanding area, the margins, and the areas of open grassland.

Production Development Zone (Breeding Birds)

2.7.6 It has not been possible to undertake a breeding bird survey of the PDZ in 2023. The scrub habitats overlap extensive stands of Japanese knotweed: an eradication programme was initiated by Associated British Ports (ABP) in February 2023 with the removal of the majority of the scrub habitats, bramble and gorse to enable to full assessment of the extent of the stands and enable crown stripping and herbicide treatment to reduce the vigour of the plants.

2.7.7 The breeding bird survey undertaken for the Harbourside site has provided information on the assemblage of species in different habitat types in the docks. In particular, the habitat types and patchwork of grassland and scrub in the PDZ is largely equivalent to the features found in Area C East, with the exception that Japanese knotweed is only present as localised stands in the latter.

2.7.8 Area C East adjoins the western boundary of the PDZ and willow scrub habitat overlaps the boundary. The areas of mixed scrub, bramble and naturally regenerating grassland in the two areas are very similar in scale, structure and composition. The species assemblage in the wider harbourside site (Areas C West, Area B and Area A) has also been considered where relevant to other habitat types within the PDZ. With close similarities in habitat type and structure, the precautionary extrapolation of breeding bird data in this report is considered to reflect the potential breeding bird assemblage in the PDZ.

3 RESULTS

3.1 Overwintering birds

WeBS Data (Open Water Dock)

3.1.1 The WeBS data collected during monthly surveys over a 5 year period comprised records of 23 species within the docks area. The species, frequency of presence and peak counts are detailed in Table 3.1.

Table 3.1 WeBS Data Summary - July 2012 to December 2016

Common Name	Scientific Name	Number of Months Recorded (out of 60)	Peak Counts	Month of Peak Count
Black headed gull	*Chroicocephalus ridibundus*	39	128	December
Canada goose	*Branta canadensis*	17	50	December
Common gull	*Larus canus*	18	63	December
Common sandpiper	*Actitis hypoleucos*	1	1	May
Coot	*Fulica atra*	36	29	December
Cormorant	*Phalacrocorax carbo*	44	12	November
Gadwall	*Anas strepera*	1	1	February
Goosander	*Mergus merganser*	1	1	February
Great black-backed gull	*Larus marinus*	33	5	October
Great crested grebe	*Podiceps cristatus*	12	6	March
Grey heron	*Ardea cinerea*	22	4	November
Herring gull	*Larus argentatus*	52	261	November
Kingfisher	*Alcedo atthis*	6	2	July
Lapwing	*Vanellus vanellus*	4	21	January
Lesser black-backed gull	*Larus fuscus*	46	201	July
Little grebe	*Tachybaptus ruficollis*	16	9	December
Mallard	*Anas platyrhynchos*	45	46	August
Moorhen	*Gallinula chloropus*	32	4	February
Mute swan	*Cygnus olor*	45	11	November
Oystercatcher	*Haematopus ostralegus*	6	2	July
Snipe	*Gallinago gallinago*	31	52	December
Tufted duck	*Aythya fuligula*	3	3	February
Wigeon	*Anas penelope*	3	4	September

3.1.2 The species present in the dock during over 65% of the survey visits were herring gull, lesser black-backed gull, black headed gull, cormorant, mallard and mute swan. The three gull species had the highest peak counts. The numbers of species recorded during each WeBS survey visit was relatively low and over the five years, multiple wetland species have been only been recorded on a few occasions in low numbers.

Open Water Dock

3.1.3 During the winter bird survey visits undertaken between October 2022 and March 2023 a total of 23 species were recorded in habitats in the open water dock. A summary of the species recorded, together with peak and mean counts is provided in Table 3.2. The survey results are shown on Figures 2-6. The survey data is presented in full in Appendix A.

3.1.4 There is a vertical edge to the Crown Wharf berth with sections of old structures extending into the dock. Mallard and cormorant were the only species recorded in these locations during the surveys.

Table 3.2 Wintering Bird Assemblage Open Water Dock – October 2022 to March 2023

Species	Scientific Name	Peak count (Open Water Dock)	Note
Black headed gull	*Chroicocephalus ridibundus*	45	Variable numbers
Canada goose	*Branta canadensis*	4	Recorded on 3 visits
Coot	*Fulica atra*	8	Resident
Cormorant	*Phalacrocorax carbo*	6	Present throughout winter
Great black-backed gull	*Ichthyaetus ichthyaetus*	1	Recorded on 2 visits
Great crested grebe	*Podiceps cristatus*	5	Species recorded on 2 visits
Herring gull	*Larus argentatus*	80	Present throughout winter
Kingfisher	*Alcedo atthi*	1	Occasional winter visitor
Lapwing	*Vanellus vanellus*	3	Occasional winter visitor
Lesser black-backed gull	*Larus fuscus*	9	Regularly present in winter
Mallard	*Anas platyrhynchos*	19	Variable numbers recorded
Moorhen	*Gallinula chloropus*	1	Likely resident species
Mute swan	*Cygnus olor*	2	Present throughout winter
Oystercatcher	*Haematopus ostralegus*	2	Occasional winter visitor
Snipe	*Gallinago gallinago*	7	Present throughout winter (total under recorded)
Tufted duck	*Aythya fuligula*	2	Rare winter visitor

Production Development Zone

3.1.5 A total of 28 species were recorded within the site boundary during winter bird survey visits undertaken between November 2022 and February 2023. A summary of the species recorded, together with their peak and mean counts is provided in Table 3.3. The full survey data is presented in Appendix B.

3.1.6 Out of the 28 species, a total of 12 species of conservation interest were recorded which meet at least one of a range of criteria relating to nature conservation including Species of Principal Importance (Section 7) or Birds of Conservation Concern in Wales (BoCCW) Red and Amber lists in Wales.

Table 3.3 Production Development Zone - Overwintering Bird Activity, Winter 2021-2022

Common Name	Scientific Name	Peak Counts		
		PDZ	Area C East Adjoining scrub and grassland	Note
Blackbird	*Turdus merula*	8	1	Present throughout winter
Blue tit	*Cyanistes caeruleus*	6	3	Present throughout winter
Bullfinch	*Pyrrhula pyrrhula*	2	2	Occasionally recorded

Buzzard	*Buteo buteo*	1	0	Overflying
Carrion crow	*Corvus corone*	3	1	Regularly recorded
Cetti's warbler	*Cettia cetti*		1	Recorded once
Chaffinch	*Fringilla coelebs*	3	2	Regularly recorded
Chiffchaff	*Phylloscopus collybita*	4	2	Regularly recorded
Dunnock	*Prunella modularis*	3	4	Regularly recorded
Goldcrest	*Regulus regulus*	2	0	Regularly recorded
Goldfinch	*Carduelis carduelis*	22	5	Flocks regularly recorded
Great tit	*Parus major*	3	2	Regularly recorded
Grey wagtail	*Motacilla cinerea*	1	0	Recorded once
Linnet	*Linaria cannabina*	2	1	Recorded twice
Long-tailed tit	*Aegithalos caudatus*	13	5	Flocks regularly recorded
Magpie	*Pica pica*	3	11	Regularly recorded
Mistle thrush	*Turdus viscivorus*	1	1	Occasionally recorded
Pied wagtail	*Motacilla alba yarelli*	0	1	Recorded once
Redwing	*Turdus iliacus*	7	0	Regularly present in winter
Robin	*Erithacus rubecula*	10	3	Present throughout winter
Snipe	*Gallinago gallinago*	4	0	Regularly present in winter
Song thrush	*Turdus philomelos*	3	3	Present throughout winter
Sparrowhawk	*Accipiter Nisus*	2	2	Occasionally recorded
Stonechat	*Saxicola rubicola*	0	2	Off-site scrub
Water rail	*Rallus aquaticus*	1	0	Recorded once
Wood pigeon	*Columba palumbus*	2	2	Occasionally recorded
Woodcock	*Scolopax rusticola*	2	0	Recorded twice
Wren	*Troglodytes troglodytes*	7	3	Present throughout winter

3.2 Breeding Birds

Breeding Bird Assemblage

Harbourside Site

3.2.1 The breeding bird survey of the Harbourside site within Port Talbot Docks recorded a total of 31 species were recorded in habitats or hunting in the site, of which 24 were classified as breeding within the site boundary. The six of other seven species are likely to be nesting in nearby habitats; with only grey heron likely to have travelled to the site from further afield. The breeding bird assemblage for the different sections of the Harbourside site are presented in Appendix C.

Area C East

3.2.2 Eleven species were confirmed or assumed to be nesting in Area C East. The assemblage of species associated with Area C East had some variation compared to the other areas of the Harbourside site due to the extent of regenerating willow scrub and areas of mixed shrubs species comprising gorse, bramble, hawthorn and butterfly bush. The species composition comprised common and widespread bird species associated with urban areas (wren, dunnock, chaffinch, robin, blackbird, great tit and blue tit) alongside species associated with scrub woodland habitats (chaffinch, song thrush, blackcap and chiffchaff).

3.2.3 One BoCCW red list species was recorded, whitethroat with three pairs present in mixed scrub. Dunnock BoCCW Amber was also associated with this habitat. The total number of nesting pairs of each species and the total number of breeding pairs was low for the size of the area.

Table 3.4 - Recorded activity in Area C East in 2021 and predicted activity in the PDZ

Species	Breeding Pairs Area C East 2021	Precautionary estimate of nesting pairs in PDZ	Breeding Status PDZ	Breeding Status in Wider Harbourside Site
Blackbird	1	2-4	Confirmed	*Confirmed*
Blackcap	2	1-3	Confirmed	*Confirmed*
Blue tit	1	0-2	Limited nesting habitat	*Confirmed*
Bullfinch	0	0-2	Possible breeding species	*Possible*
Carrion crow	0	-	Limited nesting habitat	*Non-breeding*
Cetti's warbler	0	0-1	Possible breeding species	*Confirmed*
Chaffinch	2	1-3	Confirmed	*Confirmed*
Chiffchaff	2	1-3	Confirmed	*Confirmed*
Dunnock	1	1-5	Confirmed	*Confirmed*
Goldcrest	0	1	Assumed breeding	*Not recorded*
Goldfinch	0-1	0-3	Confirmed	*Confirmed*
Great spotted woodpecker	-	-	No suitable nesting habitat	*Non-breeding*
Great Tit	1	0-2	Limited nesting habitat	*Confirmed*
Linnet	0	0-2	Possible breeding species	*Confirmed*
Long-tailed tit	0	1-2	Confirmed	*Confirmed*
Magpie	0	0-1	Possible	*Confirmed*
Mistle thrush	0	-	Limited nesting habitat	*Non-breeding*
Peregrine	0	-	Overflies the site	*Overflies the site*
Reed warbler	Not recorded	0-2	Sub-optimal habitat	*Confirmed*
Robin	2	3-6	Confirmed	*Confirmed*
Sedge warbler	Not recorded	0-1	Possible but sub-optimal habitat	*Confirmed*
Snipe	Not recorded	-	Non-breeding winter visitor	*Non-breeding*
Song thrush	2	1-3	Confirmed	*Confirmed*
Sparrowhawk	Not recorded	-	No suitable nesting habitat	*Non-breeding*
Whitethroat	6	0-3	Confirmed	*Confirmed*
Woodpigeon	0	1-2	Possible	*Probable*
Wren	4	4-10	Confirmed	*Confirmed*
Other Species Recorded in the wider Harbourside Site				
Coal tit				*Non-breeding*
Common buzzard				*Non-breeding*
Skylark				*Confirmed*
Meadow pipit				*Confirmed*
Swallow				*Non-breeding*
House martin				*Non-breeding*
Sand martin				*Confirmed*
Wheatear				*Non-breeding migrant*
Little Grebe				*Confirmed*
Mallard				*Confirmed*
Tufted Duck				*Confirmed*
Grey Heron				*Non-breeding*
House sparrow				*Non-breeding*
Kestrel				*Non-breeding*
Moorhen				*Confirmed*
Stonechat				*Confirmed*
Starling				*Non-breeding*
Pied wagtail				*Possible*
Reed bunting				*Confirmed*

4 DISCUSSION

4.1 Wintering Birds

Open Water Dock (Wintering Bird Assemblage)

4.1.1 A total of 16 species of conservation interest were recorded across the surveys of the open water dock during monthly counts between October 2022 and March 2023 and surveys of the PDZ between October 2021 and March 2022. These species meet at least one of a range of criteria relating to nature conservation; namely Species of Principal Importance (Section 7, Environment Wales 2016), Birds of Conservation Concern in Wales (BoCCW) Red or Amber lists, or species protected under Schedule 1 of the Wildlife and Countryside Act 1981. These are summarised in Table 4.1.

4.1.2 The species composition recorded in 2022/ 2023 closely matched the monthly counts completed over five years at the time when WeBS surveys were being undertaken in the dock.

4.1.3 Several wildfowl species that were not recorded in the recent survey have been recorded as very rare autumn/winter visitors in the past: tufted duck, wigeon, goosander, and gadwall. Mallard was the only wildfowl species that is consistently recorded in the open water dock.

4.1.4 Four wader species have been recorded in the past: oystercatcher, lapwing, snipe and common sandpiper. These species were recorded rarely and in small numbers with the exception of wintering snipe with counts higher than 30 species in mid-winter, with a peak high count of 52.

Table 4.1 Overwintering Birds (Section 7 and BoCC Species)

Common name	Scientific name	Conservation Status		
		Schedule 1 species	Section 7 species Environment Wales Act (2016)	BoCCW4 Red and Amber Species
Open Water Dock				
Herring gull	*Larus argentatus*		✔	Red
Lesser black-backed gull	*Larus fuscus*			Red
Great black backed gull	*Larus marinus*			Amber
Black headed gull	*Chroicocephalus ridibundus*		✔	Red
Coot	*Fulica atra*			Amber
Kingfisher	*Alcedo atthis*	✔		Green
Lapwing	*Vanellus vanellus*		✔	Red
Grey heron	*Ardea cinerea*			Amber
Oystercatcher	*Haematopus ostralegus*			Amber
PDZ				
Water rail	*Rallus aquaticus*			Amber
Woodcock	*Scolopax rusticola*			Red
Snipe	*Gallinago gallinago*			Amber
Additional species recorded during WeBS Counts				
Common gull	*Larus canus*			Amber
Common sandpiper	*Actitis hypoleucos*			Amber
Wigeon	*Anas penelope*			Amber

Open Water Dock

BoCCW4 Red List Species

4.1.1 Black-headed gull is a common non-breeding- resident with an overwintering UK population of 2,200,000 birds. The WeBS data indicates that flocks of black-headed gulls are frequently present in winter. The WeBS peak count for the dock was 128. During the surveys in winter 2022/2023 the peak count was much lower, 24 individuals. Larger flocks of black headed gulls roosted on the sand banks on the sides of the River Afan close to the tidal gates / shipping lock, with counts of over 200 at low tide. The number of individuals in the dock will vary depending on the tide, with higher numbers during the high tide period when the sand bank is covered, and a proportion of the birds will move into the dock. Overall the open water dock is classified as having local importance for this species.

4.1.2 Herring gull is a common winter visitor with an estimated UK population of 730,000 individuals. A peak count of 131 individuals in October across the open water dock. Herring gull was the most frequently recorded species during the WeBS counts with presence noted on 52 of the 60 surveys, and a peak count of 261. Smaller numbers remain in summer and nesting/fledged young has been noted on industrial buildings close to the dock. The dock has local importance for the wintering population and nearby breeding population of the species.

4.1.3 Lapwing is a common winter visitor to the area with a UK wintering population of 620,000. Three individuals were observed on one occasion on an old wooden berth at the western end of the open water dock. Lapwing were recorded on four occasions in winter during the WeBS counts and once during winter 2022/2023 and is considered to be an occasional visitor. The dock has site level importance for this species.

4.1.4 Lesser black-backed gull is a common migrant and winter visitor with a wintering UK population of 120,000 individuals. This species was recorded in low numbers during the winter with at least an individual bird observed on the open water dock during half of the surveys. The peak count was 9 in December 2022. The dock has importance for the wintering population in the context of the site.

4.1.5 Woodcock is uncommon in the region with coastal habitat being primarily used in winter. The species has an overwintering UK population of 1,400,000 individuals. It is a scarce breeding species with fewer than 50 10k squares in Wales (28), but more widespread in winter but typically occurring at low abundance. Woodcock was record on two occasions (February and March 2022) representing individuals feeding around seasonally flooded areas before dispersing to breeding grounds. The presence of two individuals in late winter confers importance in the context of the site.

BoCCW4 ‘Amber’ List Species

4.1.6 Snipe is a common winter visitor and passage migrant with high counts regionally in the winter months. The peak count of 8 individuals in vegetation around an area of off-site seasonal pooling in previously disturbed land adjacent to Crown Wharf suggests at least site importance. The past WeBS peak count of 52 for the dock as a whole indicates that the dock area has the potential to have district importance as a wintering habitat for this species.

4.1.7 Coot is a locally common winter visitor with regionally high abundances over the winter. Coot is resident in the open water dock, frequently recorded in the reedbed on the opposite bank to Crown Wharf. The peak count of 10 individuals in the open water dock indicates it has local value for this species.

4.1.8 Great black backed gull is a common resident with small numbers seen further south of the site. Single birds were recorded on two occasions and the dock has low importance for the species.

4.1.9 Oystercatcher is a common resident becoming regionally numerous in the winter. Some of the sparsely vegetated ground around the margins of the docks has the potential to be used by a nesting pair. The small numbers of birds recorded indicates that the site has low importance for the species.

4.1.10 Snipe were consistently recorded in the PDZ with counts of between 1 and 4. Snipe is a common winter visitor and the species using the PDZ are a proportion of the local population and the flooded hardstanding has site level importance.

4.1.11 Water rail is a locally common winter resident in the region and was recorded on the margin of the flooded hardstanding in the PDZ on one occasion during the winter 2021/2022 surveys and is considered to be a rare visitor.

4.1.12 Grey wagtail has limited regional abundance with low counts across the region common. The population is estimated to be 5,950 pairs. One individual was recorded on one occasion during winter indicates the PDZ has very low importance for the species.

4.1.13 Mistle thrush is a common resident breeder with regional counts of double-digits common. A single individual was recorded in the PDZ on two occasions in January and early February 2022 and was not recorded in March. The PDZ is a resource of low important resource for the species.

Schedule 1 Species

4.1.14 Kingfisher is a locally common resident with a GB population of ~4000 breeding pairs. The estimated population in Wales is between 445 and 970. Kingfisher was recorded on one occasion during the overwintering surveys when an individual flew into the dock from the east and entered the reedbed. Kingfisher was recorded on six occasions during the 60 WeBS counts indicating that this species is periodically using the dock as a foraging area. Kingfisher is on the BoCCW4 green list and is of least conservation concern. The dock is considered to have importance for this species at the level of the site.

4.2 Breeding Bird Assemblage

Production Development Zone (Precautionary Assessment)

4.2.1 A precautionary assessment of the breeding bird assemblage using the PDZ is also presented in Table 4.2. The assessment is based on the types of habitat and observations of activity in these features in the wider docks. The precautionary assessment assumes a higher diversity than was observed on the ground during other survey work.

4.2.2 With closest habitat similarities, the predicted breeding assemblage will be closest to Area C East but considers the extent of each of the different habitat types and the breeding bird survey results from across the Harbourside site.

4.2.3 Overall, it is estimated that between 12 and 20 species have nested in the PDZ. This includes all the species that were confirmed as breeding in Area C East in 2021 and additional species based on the habitats and / or detections.

4.2.4 Nine of these species meet at least one of a range of criteria relating to nature conservation including Species of Principal Importance (Section 7, Environment Wales 2016), Birds of Conservation Concern in Wales (BoCCW) Red or Amber lists, or species protected under Schedule 1 of the Wildlife and Countryside Act 1981. These are listed in Table 4.3.

4.2.5 The highest value nesting habitat is associated with the denser structured vegetation, principally bramble, gorse and woody hawthorn scrub which have a scattered distribution across the PDZ. Dense bracken and reed also provides potential cover for ground nesting birds.

4.2.6 The areas of open structured grassland form a patchwork between the scrub and the Japanese knotweed, as a consequence are relatively enclosed and have negligible value for species of ground nesting birds such a skylark and meadow pipit, which both favour larger areas of low vegetation cover.

Table 4.3 Potential Breeding Bird Species (Section 7 and BoCC) in Production Development Zone

Common name	Scientific name	Conservation Status		
		Schedule 1 species	Section 7 species Environment Wales Act (2016)	BoCCW4 Red and Amber Species
Bullfinch	*Pyrrhula pyrrhula*		✔	Amber
Cetti's warbler	*Cettia cetti*	✔		Green
Chaffinch	*Fringilla coelebs*			Amber
Dunnock	*Prunella modularis*		✔	Amber
Goldcrest	*Regulus regulus*			Red
Linnet	*Linaria cannabina*		✔	Red
Magpie	*Pica pica*			Amber
Song thrush	*Turdus philomelos*		✔	Green
Whitethroat	*Sylvia communis*			Red

Schedule 1 Species

4.2.7 Cetti's warbler is regional status locally common resident breeding species recorded from 43 locations in the bird report. It was recorded singing from scrub adjoining reedbed within the PDZ in spring 2022. It was recorded on one occasion during the overwintering surveys to west of the PDZ, but in habitat with low suitability for nesting. There are no Welsh population estimates given due to it being recorded in less than 50 10km squares in Wales 2007-2011. It had been recorded as breeding in 47 and this will have increased in the intervening period as the population continues to increase. It is on the BoCCW4 green list and is of least conservation concern.

BoCC Wales Red List

4.2.8 Goldcrest is a common resident breeder with a Wales population estimate of 85,500. Goldcrest is classified as a breeding species with a pair recorded in the line of cypress conifers on the eastern boundary. The winter peak count was three individuals with birds observed feeding on the regenerating willow. The PDZ has importance for the species in the context of the site.

4.2.9 Linnet is classified as a common resident breeder, winter visitor and passage migrant at a regional scale. The Wales breeding population is estimated as 47,500. It is known to breed in small number on the wider Harbourside site. The gorse/bramble habitats on the eastern side of the PDZ have the potential to provide nesting sites for this species. Very small numbers of linnets were also recorded in winter (peak count of two) with the PDZ forming a small proportion of the winter foraging area used by the local population of this species. The PDZ is considered to have importance in the context of the site.

4.2.10 Whitethroat is classified as a common breeding passage migrant at a regional scale. The Wales breeding population is estimated as 79,500. It is known to breed in gorse, bramble and scrub in the wider Harbourside site. The PDZ is considered to have importance in the context of the site.

BoCC Wales Amber List

4.2.11 Bullfinch is a common resident breeder in the region but with low counts regionally over the winter months. The population estimate for Wales of 29,500. The dense scrub on the eastern side of the site has the potential to have been used as a nest site with pair of bullfinch occasionally observed during the winter months. The site is of low importance to the species.

4.2.12 Chaffinch is a common winter visitor and passage migrant in the region with high winter counts regionally. The population estimate for Wales is 470,000. Chaffinch were confirmed to be nesting in adjacent scrub habitats and is classified as a breeding species in the PDZ. The peak count in winter was four. The PDZ has importance for the species in the context of the site.

4.2.13 Dunnock is a common breeder and winter resident in the region with solitary individuals often being recorded, double figure counts are of regional significant. A single pair of dunnock bred in adjacent mixed scrub habitats and it is used that several pairs will have nested in equivalent habitat in the PDZ. The peak count of seven was recorded during the winter. Overall the PDZ is classified as having local importance for the dunnock.

4.2.14 Magpie is a common resident breeder in the region and multiple records in the region of 10+ are common. Magpie has been regularly observed within the PDZ and is a possible breeding species, but the open structure of the willow shrubs significantly reduces the potential nest sites. Magpie was also present in the PDZ in winter with a mean count in winter was four individuals. The PDZ has a low level of importance for the species.

4.2.15 Observations from site walkovers in summer months in 2021 and 2022 found a surprisingly low level of activity in the regenerating willow scrub. This is the most extensive habitat type in the PDZ site but their open growth structure and narrow diameter branches provide limited cover for nest sites and are sub-optimal habitat. The ground flora cover below the regenerating willow is also poorly developed, and again provides sub-optimal conditions for nesting. Consequently the precautionary baseline being used is likely to overestimate the use of the development area.

Open Water Dock

4.2.16 A number of birds will be nesting on the margins of the docks with additional species nesting in the adjoining scrub. The BoCCW4 red list species, herring gull and lesser-backed gull, both nest on the roofs of industrial buildings in the vicinity of the dock. Coot, a BoCCW4 amber list species, is also resident in the dock and will be nesting in dense marginal cover. The passerines reed warbler, sedge warbler (both green list), reed bunting (red list) and Cetti's warbler (Schedule 1 but green list) are all expected to nest in or adjoining the reedbeds on the sides of the dock. Other species nesting in the dock area include mute swan, Canada goose, mallard, and moorhen (all BoCC green list species).

Wider Harbourside Site

4.2.17 Across the part of the Harbourside site surveyed in 2021 (Areas A, B, C) a total of 31 species were recorded in habitats or hunting in the site, of which 24 were classified as breeding within the site boundary. Six of other seven species are likely to be nesting in nearby habitats; with only grey heron likely to have travelled to the site from further afield.

4.2.18 Cettis warbler occasionally heard singing from the reed/scrub area, bullfinch with a pair observed on two occasions during winter site walkovers, long-tailed tit which was regularly seen in winter and early spring; goldcrest which was consistently noted singing or calling in the line of cypress on the eastern site boundary and linnet due to the presence of some areas of dense gorse and bramble growing together.

4.2.19 Neither reed warbler nor sedge warbler have been observed or heard in the Production Development Zone, but the seasonal flooded reedbed bounded by scrub has the potential to support pairs of one or both species.

4.2.20 Many of the breeding species are associated with gardens and urban areas as well as the wider environment. Species that typically nest in cavities were also recorded foraging within the site in small numbers including fledged family groups. Great spotted woodpecker was also observed but is likely to nest in larger trees, possibly in the tree belt to the south of the railway sidings. Whitethroat, dunnock, linnet and bullfinch are all assumed to have nested in the dense scrub comprising gorse, bramble and butterfly bush which are primarily located on the eastern side of the site.

4.3 Geographical Importance

4.3.1 Data were sourced from Woodward *et al.* (2020) and Hughes *et al.* (2020) for the population estimates of wintering birds in the UK. Where available, data on populations of wintering birds in Wales were used. The county bird report from Glamorgan bird club was used for reference to specific species (Eastern Glamorgan Bird Report no.6, 2021).

Wintering Assemblage

4.3.2 The assemblage of wetland birds regularly using the dock is small, comprising species that are common and widespread in coastal/wetland habitats during winter months. All the species occur in small numbers with the exception of the gull species. The peak counts recorded during the WeBS counts in 2012-2016 were notably higher than the peak counts in winter 2022/2023.

4.3.3 A wider range of wetland species are recorded occasionally around the dock and in this context, the assemblage of wintering species is considered to be of local importance.

Breeding Assemblage

4.3.4 The precautionary assessment of the breeding bird assemblage would have comprised up to 20 breeding species with an assemblage of local importance.

5 CONCLUSION

5.1 Overwintering Birds

5.1.1 The targeted wintering bird surveys conducted through 2022-2023 indicated the use of the site by widespread and common bird species associated with the dock. No species were recorded in high numbers reaching the threshold for national or county importance.

5.1.2 Within the PDZ, both dunnock and snipe were recorded at relatively low numbers, 7 and 8 respectively. Both species were found in, but are considered to occur in locally important numbers.

5.1.3 A further 19 species that have been recorded using habitats within the Production Development Zone of dock during the winter months are classified as Red or Amber on the BoCCW4.

5.1.4 The overall assemblage of wintering species is considered to be of local importance.

5.2 Breeding Birds

5.2.1 Across the Harbourside site as a whole, a total of 24 species were recorded as breeding in 2021, with seven defined as being of conservation concern and/or species of principal importance.

5.2.2 Eleven species bred in Area C East, an area adjoining the main development area (PDZ) with very similar habitat types and extents. The breeding bird assemblage that would have utilised the PDZ prior to the initiation of Japanese knotweed control is most likely to have been equivalent in diversity.

5.2.3 However, following a more precautionary approach it is assumed that up to 20 species could have bred in the PDZ prior to the felling of the self-sown willow scrub with the assumption that areas of gorse, bramble, hawthorn and bracken would have supported several species of conservation concern including bullfinch, linnet, song thrush, whitethroat and dunnock.

5.2.4 The predicted breeding bird assemblage for the PDZ is classified as having importance in a local context with the populations of individual species important at either a site or local level.

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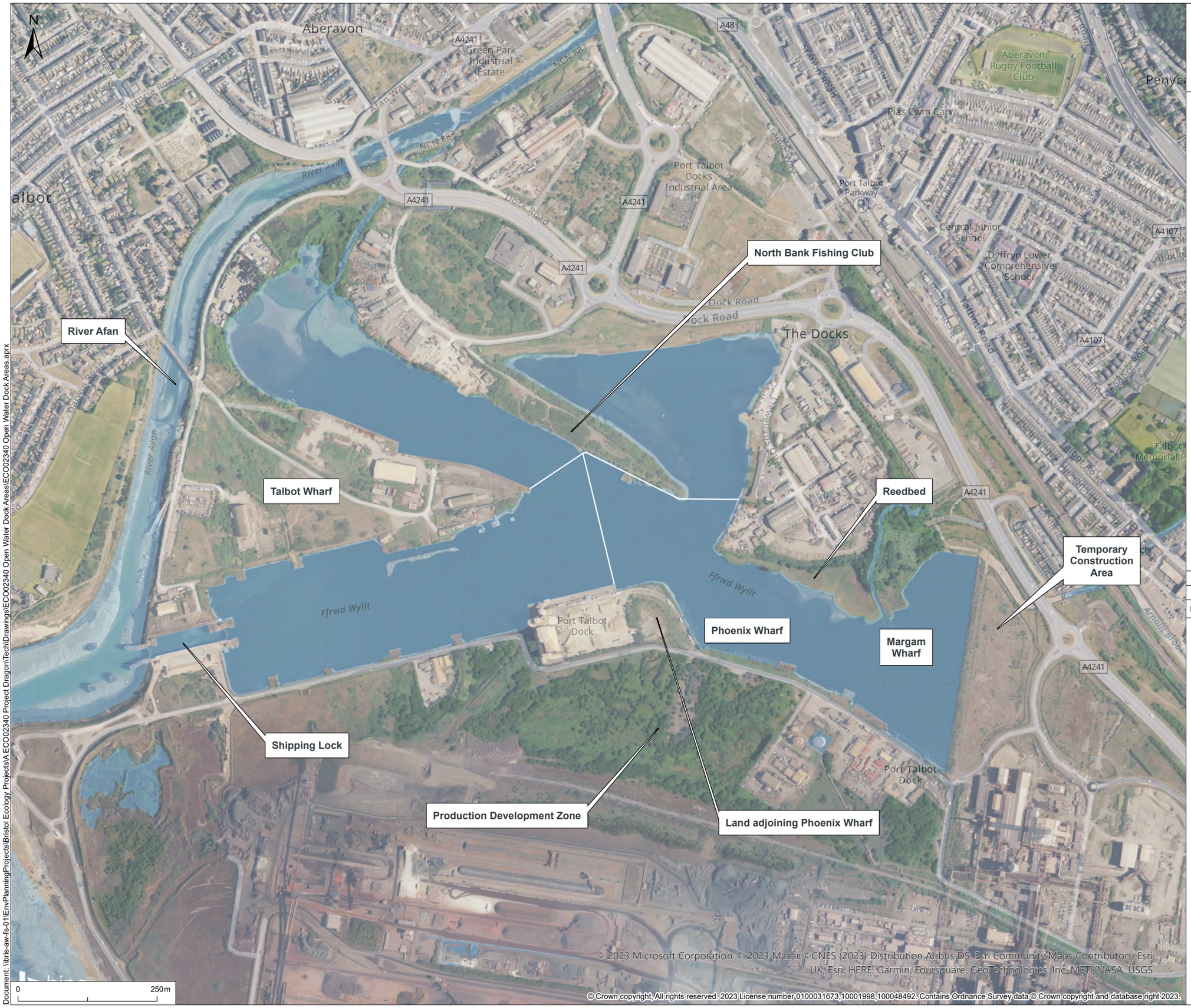
FIGURES



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Project: Project Dragon

Title: Open Water Dock Areas

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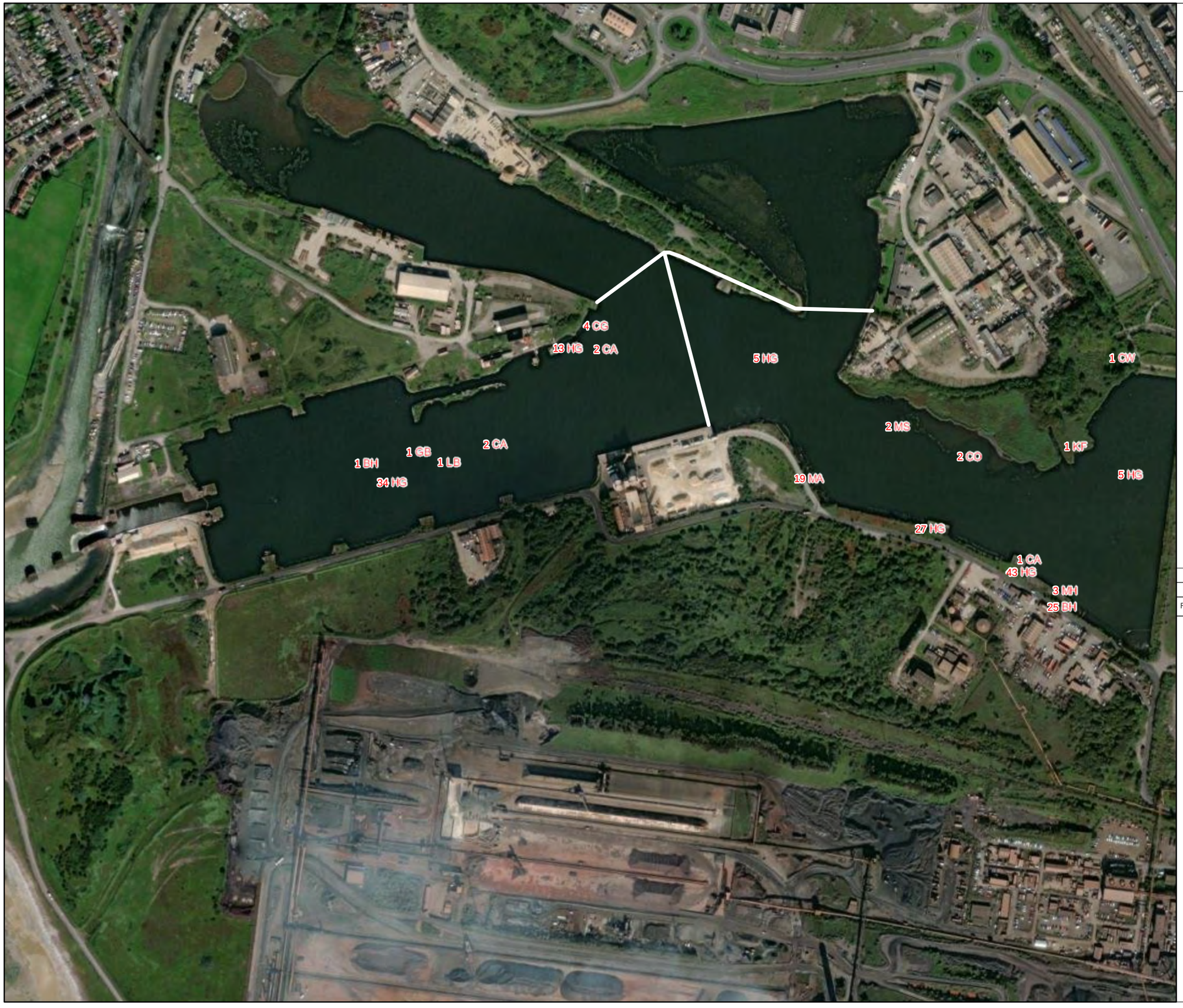

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Legend

BH	Black-headed Gull
CG	Canada Goose
CW	Cetti's Warbler
CO	Coot
CA	Cormorant
GB	Great Black-backed Gull
HG	Herring Gull
KF	Kingfisher
LB	Lesser Black-backed Gull
MA	Mallard
MH	Moorhen
MS	Mute Swan

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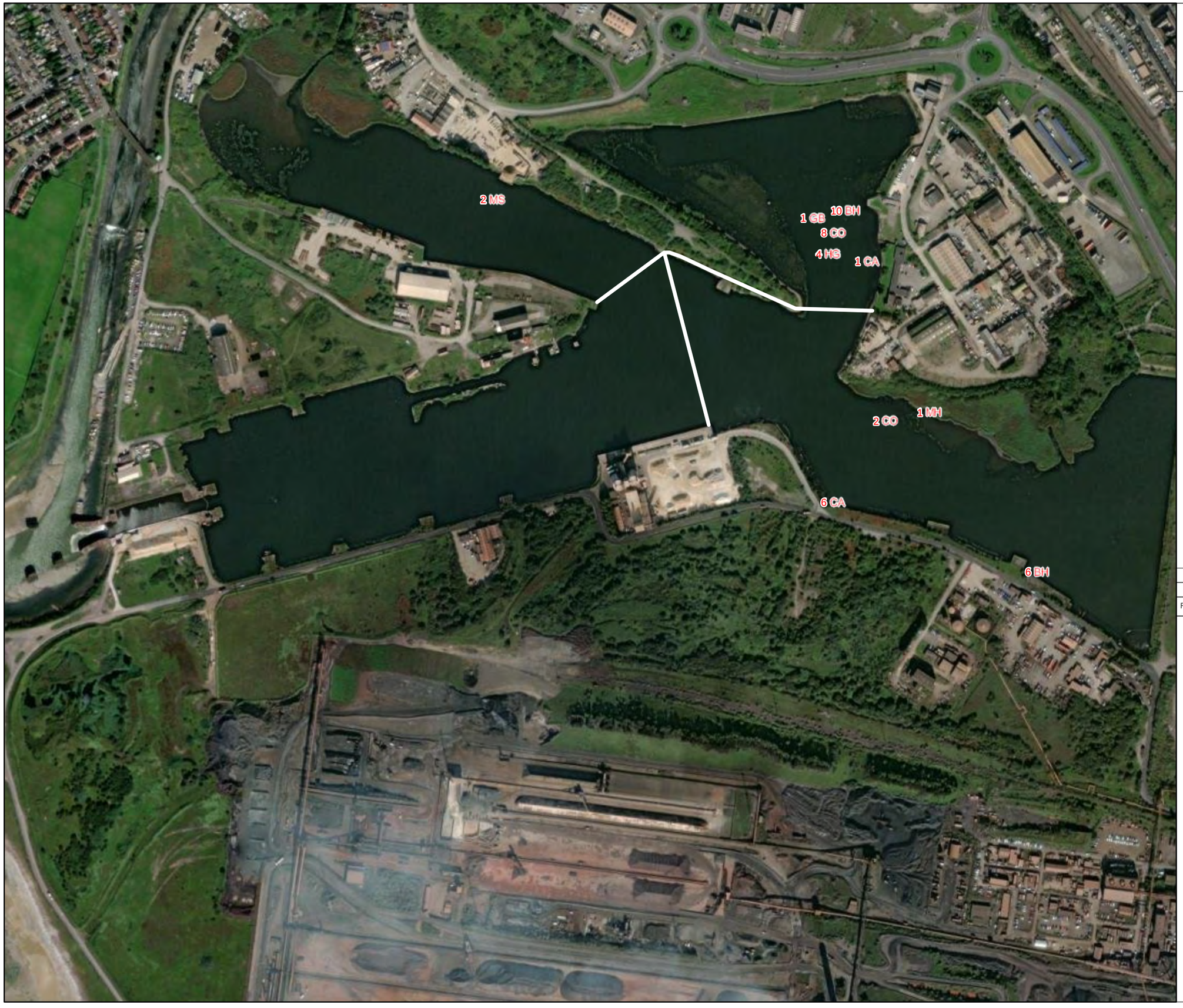

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Legend

BH	Black-headed Gull
CO	Coot
CA	Cormorant
GB	Great Black-backed Gull
HG	Herring Gull
MH	Moorhen
MS	Mute Swan

Rev	Description	By	CB	Date

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Project: Project Dragon

Title: Winter Bird Survey 14/11/2022

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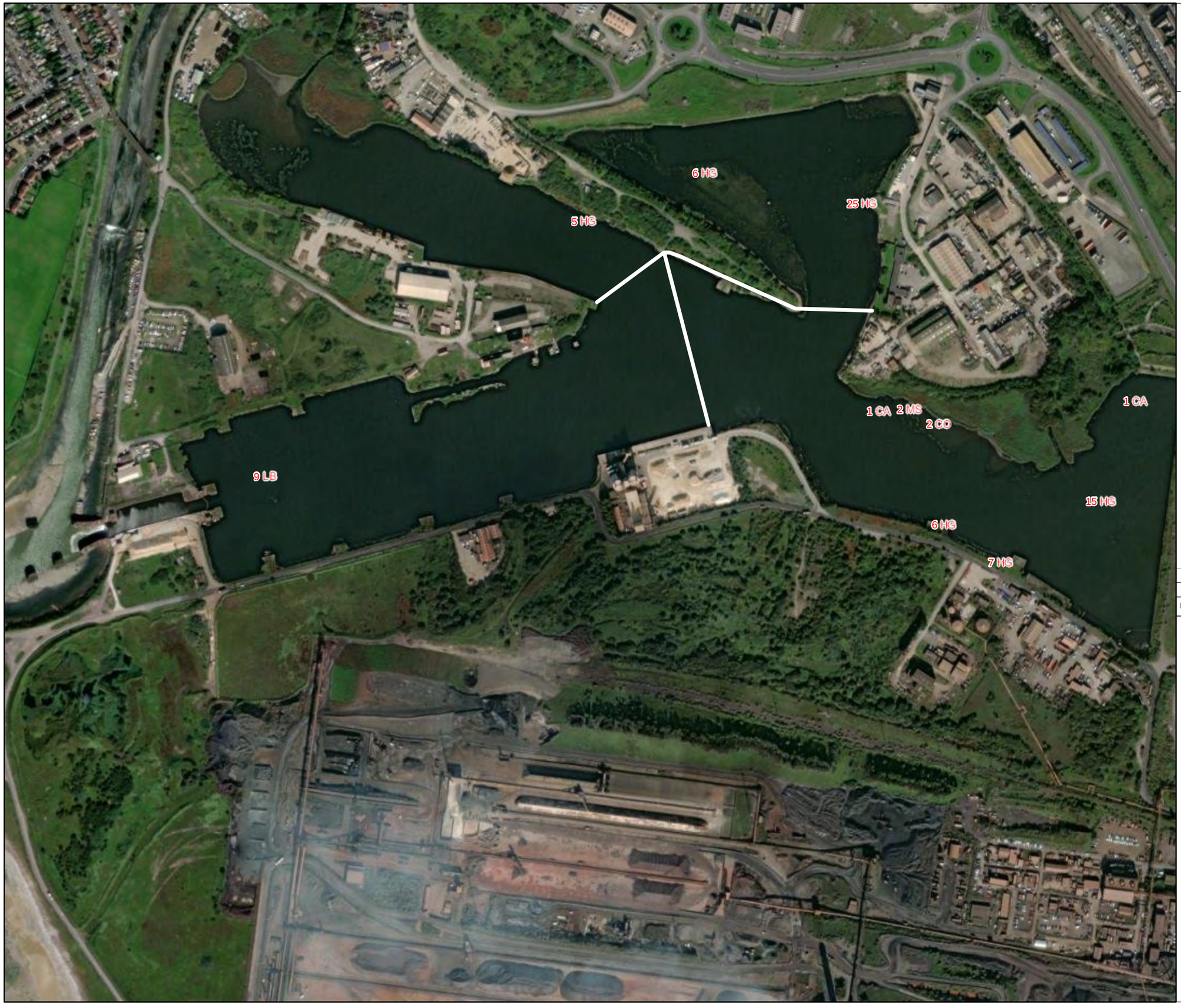

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Legend

- CO Coot
- CA Cormorant
- HG Herring Gull
- LB Lesser Black-backed Gull
- MS Mute Swan

Rev	Description	By	CB	Date

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Client LanzaTech

Project Project Dragon

Title Winter Bird Survey 12/12/2022

Status	Drawn By	PM/Checked By
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Project Number	**Scale @ A3**	**Date Created**
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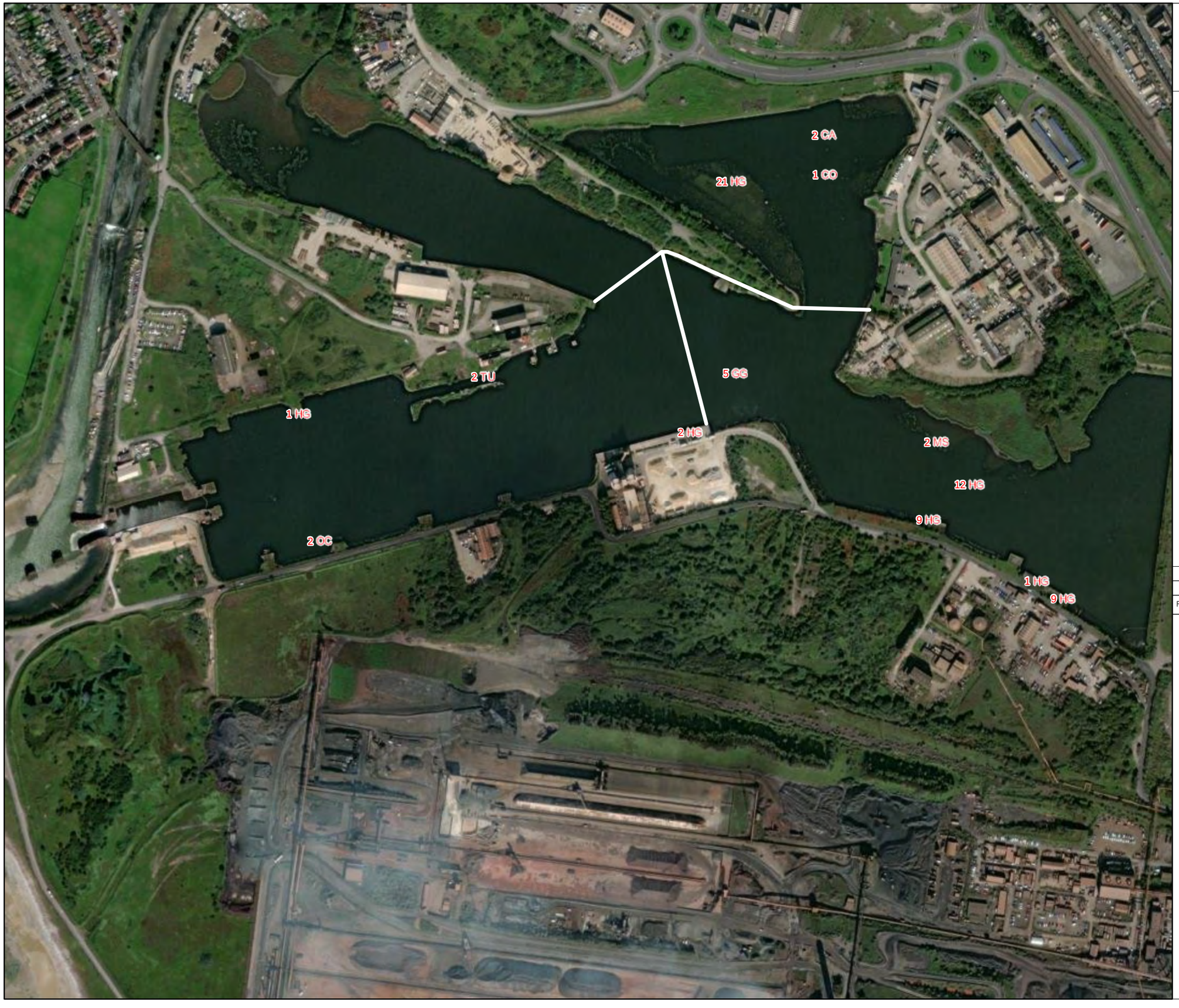

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Legend

CO	Coot
CA	Cormorant
GG	Great Crested Grebe
HG	Herring Gull
MS	Mute Swan
OC	Oystercatcher
TU	Tufted Duck

Rev	Description	By	CB	Date

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Client: LanzaTech

Project: Project Dragon

Title: Winter Bird Survey 23/01/2022

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Figure Number: 5

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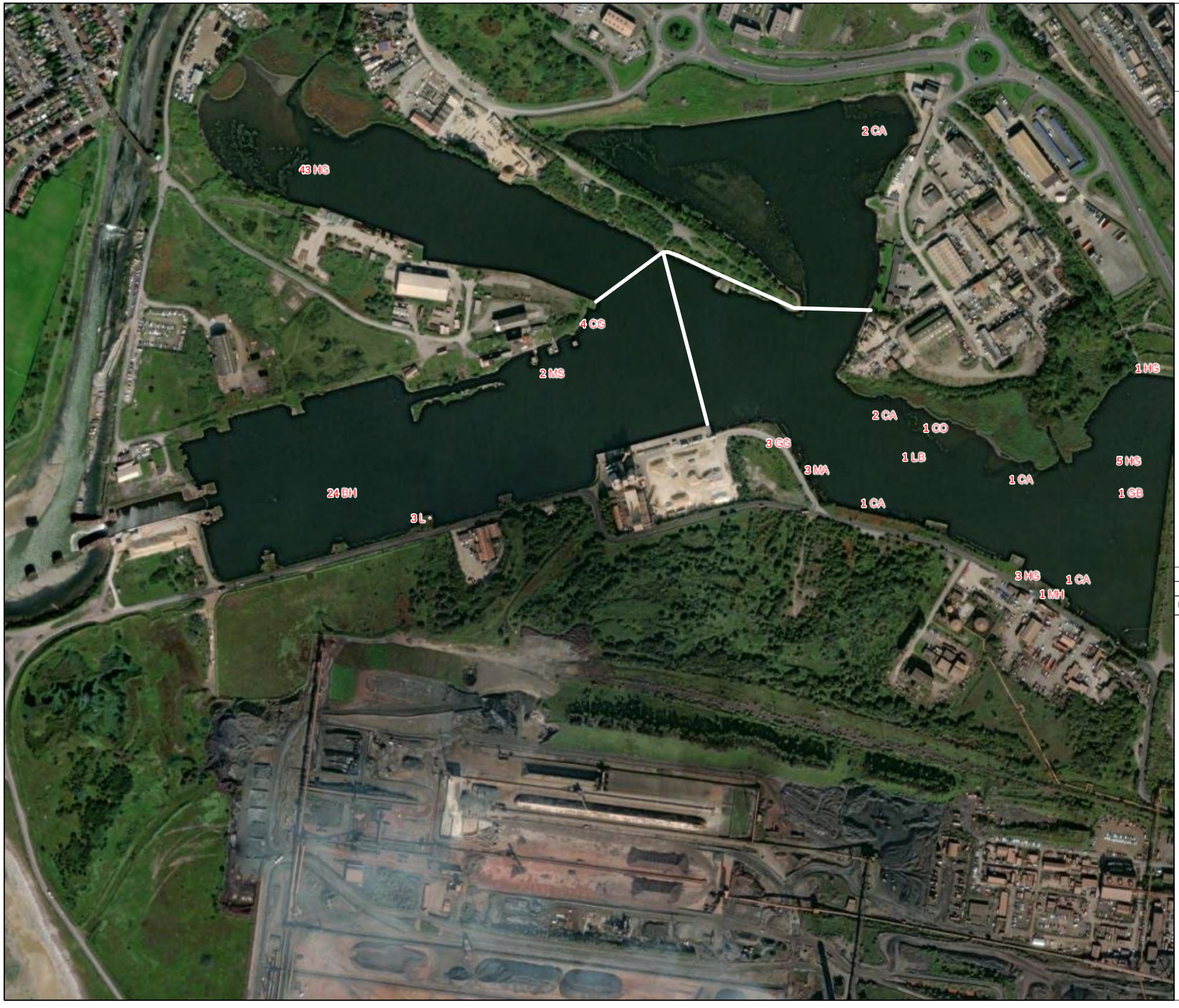

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Legend

BH	Black-headed Gull
CG	Canada Goose
CO	Coot
CA	Cormorant
GB	Great Black-backed Gull
GG	Great Crested Grebe
HG	Herring Gull
L	Lapwing
LB	Lesser Black-backed Gull
MA	Mallard
MH	Moorhen
MS	Mute Swan

Rev	Description	By	CB	Date

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Client: LanzaTech

Project: Project Dragon

Title: Winter Bird Survey 09/02/2022

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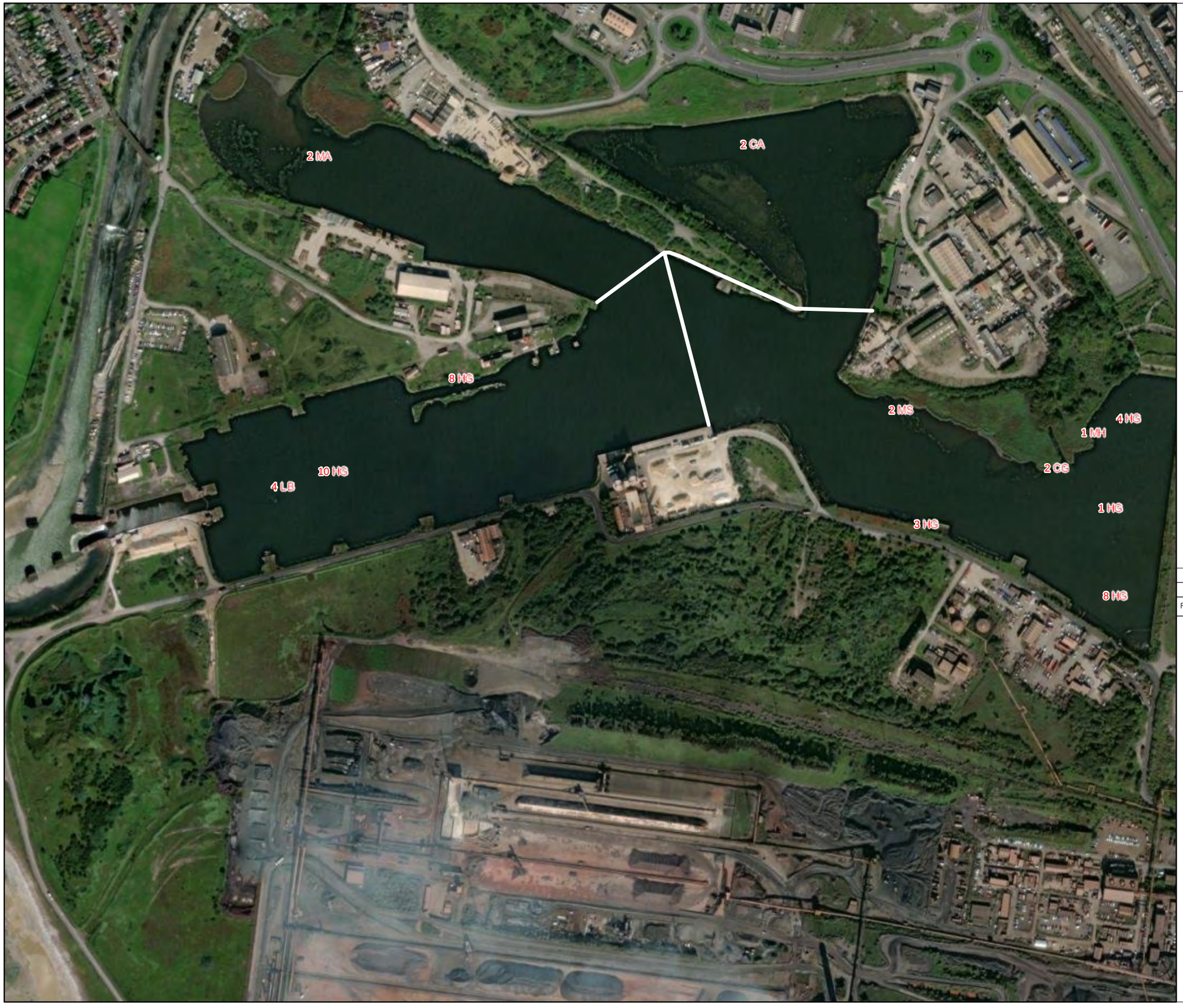

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Legend

CG	Canada Goose
CA	Cormorant
HG	Herring Gull
LB	Lesser Black-backed Gull
MA	Mallard
MH	Moorhen
MS	Mute Swan

Rev	Description	By	CB	Date

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Client: LanzaTech

Project: Project Dragon

Title: Winter Bird Survey 20/03/2023

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Legend

Site Boundaries

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Project: Project Dragon

Title: Harbourside Areas Plan

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APPENDICES

Appendix A

Open Water Dock Counts 2022/2023

Appendix A

Open Water Dock – Species Counts

Common name	10/10/2022		14/11/2022		12/12/2022		23/01/2023		09/02/2023		20/03/2023	
	Eastern Section	Wider Dock	Eastern Section	Wider Dock	Eastern Section	Wider Dock	Eastern Section	Wider Dock	Eastern Section	Wider Dock	Eastern Section	Wider Dock
Herring gull	80	51		89	23	36	33	32	8	44	18	18
Lesser black-backed gull	1	1				9			1			4
Black headed gull	12	23	6	10						24		
Great black-backed gull		1							1			
Canada goose		4								4	2	
Coot	2		2	8	2				1			
Cormorant	1	2	6		2		2		5	2		2
Great crested grebe				1			5		3			
Kingfisher	1											
Lapwing										3		
Snipe			7									
Mallard	19								3			2
Moorhen			1						1		1	
Mute swan	2			2	2		2			2		2
Oystercatcher								2				
Tufted duck										2		

Appendix B

PDZ Survey Results – Winter 2021/2022

Appendix B

PDZ Species Counts – Winter 2021 /2022

Common Name	Scientific Name	09/11/21		19/11/21		02/12/21		22/12/21		13/01/21		26/01/22		04/02/22		22/02/22		08/03/22		22/03/22	
		PDZ	Adj. scrub	**PDZ**	Adj. scrub	**PDZ**	Adj. scrub	**PDZ**	Adj. scrub	**PDZ**	Adj. scrub	**PDZ**	Adj. scrub	**PDZ**	Adj. scrub	**PDZ**	Adj. scrub	**PDZ**	Adj. scrub	**PDZ**	Adj. scrub
Blackbird	*Turdus merula*	**3**		**6**		**6**		**6**	2	**3**		**2**	1	**6**	1	**8**	1	**5**	1	**7**	1
Blue tit	*Cyanistes caeruleus*	**6**		**2**	3	**4**		**2**		**2**		**2**		**1**	2	**6**		**2**		**5**	
Bullfinch	*Pyrrhula pyrrhula*			**2**				**1**									2			**1**	
Buzzard	*Buteo buteo*											**1**				**1**					
Carrion crow	*Corvus corone*				1				1		1	**2**		**3**		**2**			2		
Cetti's Warbler	*Cettia cetti*				1																
Chaffinch	*Fringilla coelebs*	**2**		**2**	2		2					**3**		**2**	1			**1**			
Chiffchaff	*Phylloscopus collybita*			**1**		**4**	1					**2**		**1**	2					**1**	1
Dunnock	*Prunella modularis*		3	**1**	1	**2**	2	**1**	1	**3**	4				3	**3**	3			**2**	1
Goldcrest	*Regulus regulus*					**1**		**1**				**1**		**1**		**2**					
Grey wagtail	*Motacilla cinerea*			**1**			1														
Goldfinch	*Carduelis carduelis*	**22**		**6**		**1**						**19**		**3**	5	**16**					
Great tit	*Parus major*	**3**			1	**2**					2			**1**				**1**	1	**2**	
Linnet	*Linaria cannabina*		1							**2**		**1**									
Long-tailed tit	*Aegithalos caudatus*	**7**			2	**10**	2	**2**				**8**		**13**	5	**6**					
Mistle thrush	*Turdus viscivorus*											**1**			1	**1**					
Magpie	*Pica pica*	**3**			4	**1**	2	**1**			7		1		11	**1**	2		7		
Pied wagtail	*Motacilla alba yarelli*		1																		
Robin	*Erithacus rubecula*	**10**	3	**2**		**8**	2	**3**	2	**6**	4	**4**	1	**10**	3	**4**		**5**		**6**	
Redwing	*Turdus iliacus*					**7**				**4**		**2**		**1**		**3**		**2**			
Stonechat	*Saxicola rubicola*																				2
Snipe	*Gallinago gallinago*			**2**		**1**				**1**						**3**		**2**		**4**	
Song thrush	*Turdus philomelos*	**3**		**3**	2		1		3	**2**	2	**1**	1	**2**	1	**1**	1		2	**3**	
Sparrowhawk	*Accipiter nisus*								2			1	**1**		**2**						
Water rail	*Rallus aquaticus*			**1**																	
Wood pigeon	*Columba palumbus*			**2**	2			**1**													
Woodcock	*Scolopax rusticola*													**1**				**2**			
Wren	*Troglodytes troglodytes*	**7**	1	**2**		**2**	1	**3**	3							**3**	1	**1**	1		1

Appendix C

Harbourside Site Breeding Bird Assemblage

Port Talbot Docks – Harbourside Site Breeding Bird Survey 2021

Species	Scientific Name	BoCC Wales	Breeding Pairs (Est.)	Site Areas			
				Area A	Area B	Area C (West)	Area C (East)
Blackbird	*Turdus merula*	*Low*	8	2	2	3	1
Blackcap	*Sylvia atricapilla*	*Low*	2				2
Blue tit	*Cyanistes caeruleus*	*Low*	1				1
Chiffchaff	*Phylloscopus collybita*	*Low*	3			1	2
Coot	*Fulica atra*	*Low*	1		1		
Dunnock	*Prunella modularis*	*Moderate*	5	2	1	1	1
Goldfinch	*Carduelis carduelis*	*Low*	0-2		0-1		0-1
Great tit	*Parus major*	*Low*	1				1
Grey heron	*Ardea cinerea*	*Low*	0				
House sparrow	*Passer domesticus*	*Moderate*	0				
Kestrel	*Falco tinnunculus*	*High*	0				
Little grebe	*Tachybaptus ruficollis*	*Low*	1		1		
Linnet	*Linaria cannabina*	*High*	2		?		
Magpie	*Pica pica*	*Low*	1		1		
Mallard	*Anas platyrhynchos*	*Moderate*	1		1		
Meadow pipit	*Anthus pratensis*	*Moderate*	7	2	3	2	
Moorhen	*Gallinula chloropus*	*Low*	0				
Oystercatcher	*Haematopus ostralegus*	*Low*	0				
Pied wagtail	*Motacilla alba*	*Low*	0				
Reed bunting	*Emberiza schoeniclus*	*Moderate*	1		1		
Reed warbler	*Acrocephalus scirpaceus*	*Low*	6		6		
Robin	*Erithacus rubecula*	*Low*	4			2	2
Sand martin	*Riparia riparia*	*Low*	10-20			10-20	
Sedge warbler	*Acrocephalus schoenobaenus*	*Low*	5		5		
Skylark	*Alauda arvensis*	*Moderate*	6	3	3		
Song thrush	*Turdus philomelos*	*Moderate*	2				2
Starling	*Sturnus vulgaris*	*High*	0				
Stonechat	*Saxicola rubicola*	*Low*	4	2	1	1	
Tufted duck	*Aythya fuligula*	*Low*	1		1		
Whitethroat	*Sylvia communis*	*High*	6			3	3
Wren	*Troglodytes troglodytes*	*Low*	8		2	2	4

Additional species overflying the site

Canada goose	*Branta canadensis*	*Low*
Carrion crow	*Corvus corone*	*Low*
Cormorant	*Phalacrocorax carbo*	*Low*
Herring gull	*Larus argentatus*	*High*
Mute swan	*Cygnus olor*	*Low*
Peregrine	*Falco peregrinus*	*Low*

Species	Scientific Name	BoCC Wales	Breeding Pairs (Est.)	Site Areas			
				Area A	Area B	Area C (West)	Area C (East)
Wood pigeon	*Columba palumbus*	*Low*					

Annex D Breeding and Overwintering Bird Assessment

Bryophyte Surveys Ltd




Bryophyte survey and assessment of land at Port Talbot Docks

Authored by: Dr Des Callaghan

Date: 19 October 2022

Disclaimer

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CONTENTS

INTRODUCTION

All work reported here has been undertaken by Dr Des Callaghan (Bryophyte Surveys Ltd), a professional consultant bryologist and an expert on the bryophyte flora of Britain. The work was commissioned by RPS, in relation to the proposed development of land at Port Talbot Docks. The purpose of this report is:

- To identify and describe all potentially significant effects on bryophytes associated with the proposed development;
- To set out the mitigation measures required to ensure compliance with nature conservation legislation as it relates to bryophytes and to address any potentially significant effects; and
- To provide an assessment of the significance of any residual effects.

LEGISLATION

The below provides an overview of legislation that is specifically relevant to the conservation of bryophytes. It does not include any mention of more general nature conservation policy and legislation.

Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora ('the Habitats Directive')

No bryophytes are specially protected under Annex IV ('European Protected Species'). The only inclusion of bryophytes is under Annex II, which includes five species (see Appendix 1). For these, signatories are required to contribute to a coherent European ecological network of protected sites by designating a selection of their sites as Special Areas of Conservation (SACs).

The Conservation of Habitats and Species Regulations 2017 (as amended)

This piece of legislation transposes into domestic law the European Habitats Directive and European Birds Directive. Besides the requirements mentioned above under the Habitats Directive, there are no additional measures for the conservation of bryophytes.

The Natural Environment and Rural Communities Act 2006 ('the NERC Act')

Section 41 (S41) of the NERC Act requires the Secretary of State to publish a list of species and habitats of principal importance for conserving biodiversity, which includes 79 bryophyte species (see Appendix 1). The S41 list is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under Section 40 of the NERC Act, to have regard to the conservation of biodiversity when carrying out their normal functions.

The Wildlife and Countryside Act (WCA) 1981

The Act makes it an offence (subject to exceptions) to intentionally pick, uproot or destroy any wild plant listed in Schedule 8, which includes 37 bryophyte species (see Appendix 1).

METHOD

Scope of the assessment

The scope of the assessment is limited to bryophytes (mosses, liverworts and hornworts) within the area of land that would be impacted by the proposed development (Figure 1).

Desk study

A desk study undertook a review of all bryophyte records from the local area held on the NBN Gateway and within the national bryophyte recording database of The British Bryological Society.

Field survey

Fieldwork was undertaken during 10–11 October 2022, in favourable weather conditions. The survey area was split into five areas (Figure 1) and each was searched thoroughly for bryophytes, with an inventory made of all species found. Small samples of critical species were collected for determination by microscopy.

Assessment

Important bryophyte features

Legally protected species

Bryophytes with special legal protection include only those listed on Schedule 8 of the Wildlife and Countryside Act 1981 (as amended) (see Appendix 1). No bryophytes are legally protected via Annex IV of the EC Habitats Directive.

Species of conservation interest

Bryophyte species of conservation interest are considered to be any of the following:

- Species listed on Annex II of Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora ('The Habitats Directive').
- Species listed on Schedule 8 of the Wildlife and Countryside Act 1981 (as amended).
- Species listed on Section 41 of The Natural Environment and Rural Communities Act 2006 (as amended).
- Species listed as nationally threatened on the UK Red List (Critically Endangered, Endangered or Vulnerable) by Callaghan (in press).
- Nationally Rare species, recorded from ≤15 hectads (10 km grid squares) in Britain during 1970-2013 (Pescott 2016).
- Nationally Scarce species, recorded from 16-100 hectads (10 km grid squares) in Britain during 1970-2013 (Pescott 2016).

Assemblages of conservation interest

Bryophyte assemblages, i.e. collections of species, of conservation interest are considered to be those which qualify as such under the selection criteria for biological Sites of Special Scientific Interest (SSSIs) (Bosanquet et al. 2018).

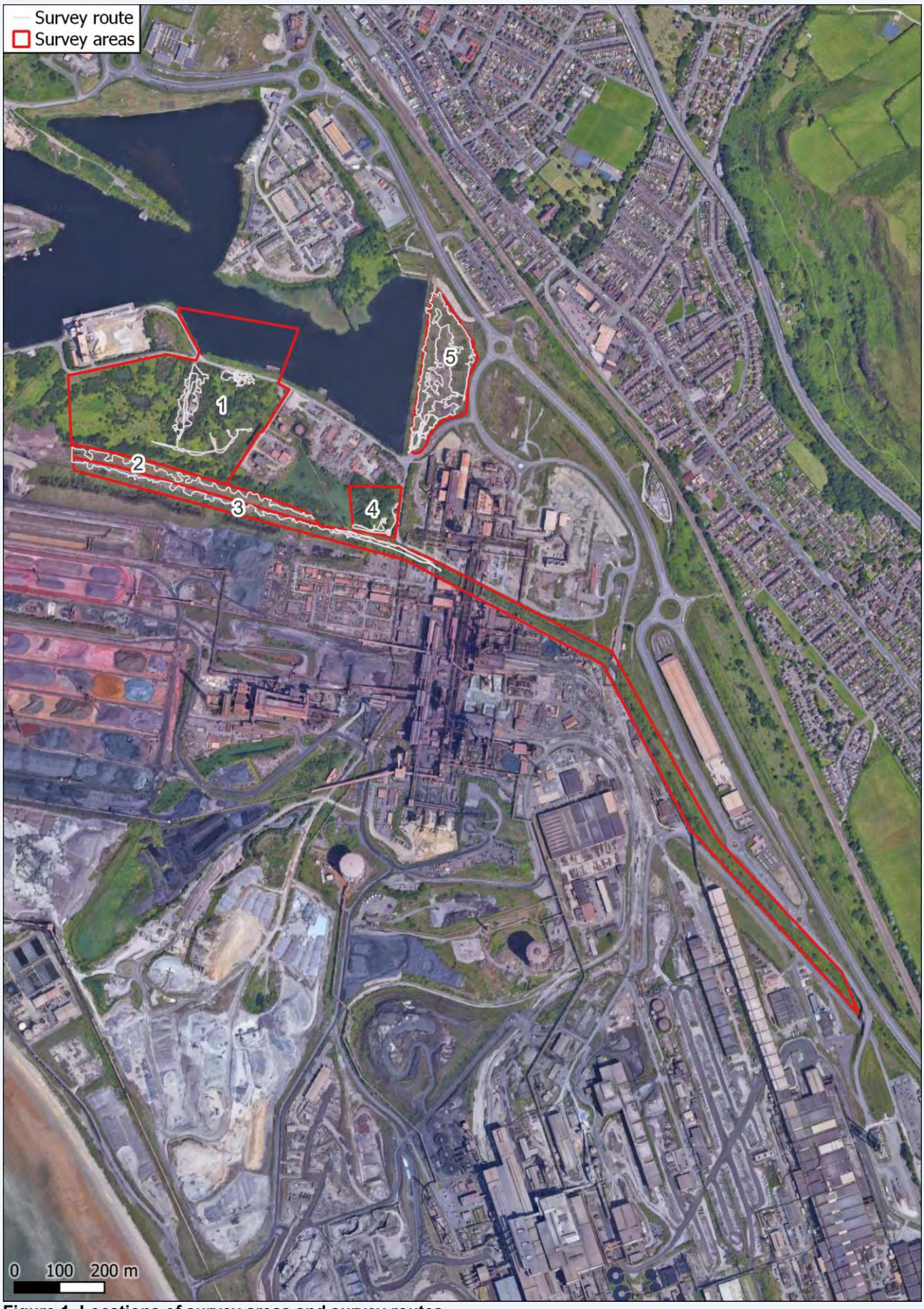

Figure 1. Locations of survey areas and survey routes.

BASELINE CONDITIONS

Previous bryophyte records

There are various bryophyte records collected previously from Port Talbot Docks, but all are frequent or common species and there are no records of any species of conservation interest.

Survey constraints

All habitat of potential interest for bryophytes was accessed and surveyed thoroughly. Significant areas of land in some areas could not be accessed due to dense Japanese Knotweed or scrub, as shown by the survey routes in Figure 1, but such habitat contained very few bryophytes, including a notable absence of epiphytes.

Species composition

A total of 50 bryophytes was found across all of the survey areas, including 48 mosses and two liverworts (Appendix 2). All are frequent or common species in Britain.

Survey Area 1

The area comprises a complex mosaic of willow scrub, bramble scrub, grassland, stands of Japanese Knotweed and sparsely vegetated ground (Figure 2). Some of the grassland in the south of the area, around SS76448857, approximates dune grassland, having developed on a sandy substrate. Access to much of the area was not possible due to dense scrub. Bryophytes are almost entirely limited to the areas of sparsely vegetated ground and grassland on sandy substrates, all of which were accessed and surveyed in detail. Epiphytes within the scrub were very poorly developed and almost all trees were completely devoid of bryophytes. A total of 44 species were recorded (Appendix 2). The community of sparsely vegetated ground, including derelict concrete padding, was dominated by common species such as *Didymodon fallax, Cratoneuron filicinum, Homalothecium lutescens, Schistidium crassipilum, Streblotrichum convolutum* and *Syntrichia ruralis*. The ‘dune grassland’ contained no wet depressions and the bryophytes included a narrow range of common species, such as *Homalothecium lutescens* and *Syntrichia ruralis*. *Calliergonella cuspidata* was locally abundant, including within the damper areas of grassland. No species of conservation interest were found.

Figure 2. View across part of Survey Area 1. SS76438862.

Survey Area 2

The area comprises a derelict railway sidings and contains a mosaic of dry grassland and sparsely vegetated ground. The bryophyte flora includes a narrow range of common species, with locally abundant *Calliergonella cuspidata, Homalothecium lutescens, Hypnum cupressiforme* var. *lacunosum, Streblotrichum convolutum* and *Syntrichia ruralis*. A total of 22 species were recorded (Appendix 2), none of which are of conservation interest.

Survey Area 3

The area comprises a derelict railway line, with a mosaic of scattered scrub, dry grassland and sparsely vegetated ground (Figure 3). A large part of the area could not be accessed due to dense Buddleja scrub. The bryophytes of the grassland and sparsely vegetated ground, including the concrete railway sleepers, comprised a narrow range of common species, including frequent *Calliergonella cuspidata, Grimmia pulvinata*, *Homalothecium lutescens, Schistidium crassipilum, Streblotrichum convolutum* and *Syntrichia ruralis*. The scrub contained very few epiphytes, largely limited to *Bryum capillare* and *Orthotrichum diaphanum*. A total of 19 species were recorded (Appendix 2), none of conservation interest.

Figure 3. View across part of Survey Area 3. SS76888836.

Survey Area 4

The area comprises a mosaic of dense willow scrub, bramble scrub, stands of Japanese Knotweed, *Phragmites* fen, grassland and some areas of sparsely vegetated ground, including derelict concrete padding. A large part of the area could not be accessed due to dense scrub. The bryophytes of the grassland included a very small range of common species, dominated by *Calliergonella cuspidata* and *Pseudoscleropodium purum*. The bryophytes of the sparsely vegetated ground comprised a range of common species, including frequent *Didymodon fallax, Schistidium crassipilum, Streblotrichum convolutum* and *Syntrichia ruralis*. A total of 17 species were recorded (Appendix 2), none of conservation interest.

Survey Area 5

The area comprises a relatively large area of open ground, including a mosaic of grassland and sparsely vegetated ground, with some small stands of scrub (Figure 4). All areas could be accessed for surveying. The bryophytes of the grassland most often included *Calliergonella cuspidata* and *Homalothecium lutescens*, and in some damp depressions there were large stands of *Drepanocladus aduncus*. The bryophytes of the sparsely vegetated ground, including on gravel spoil and concrete padding, comprised a moderately diverse range of frequent to common ruderal species, most often *Ceratodon purpureus*, *Cratoneuron filicinum, Didymodon fallax*, *Streblotrichum*

convolutum and *Syntrichia ruralis*. *Bryum archangelicum*, *Didymodon nicholsonii, Encalypta streptocarpa* and *Trichostomum crispulum* were also frequent. A total of 36 species were recorded (Appendix 2), none of conservation interest.

Figure 4. View across part of Survey Area 5. SS76968861.

Important bryophyte features

Legally protected species

No legally protected species are present.

Species of conservation interest

No species of conservation interest are present.

Assemblages of conservation interest

No bryophyte assemblages of conservation interest are present.

Summary

No legally protected bryophytes, species of conservation interest or assemblages of conservation interest are present within the survey areas. The ruderal communities of bryophytes, including those on areas of derelict concrete padding and areas where spoil has been spread historically, are moderately diverse, though nothing exceptional. The epiphyte flora is particularly poor,

including a notable absence of common epiphytes such as *Frullania dilatata, Lewinskya affinis* and *Ulota bruchii* from areas of willow scrub, seemingly due to air pollution from local industrial activity.

ASSESSMENT OF EFFECTS AND MITIGATION MEASURES

Potential impacts

Legally protected species

The proposed development will have no effect on any legally protected bryophyte species.

Species of conservation interest

The proposed development will have no effect on any bryophyte species of conservation interest.

Assemblages of conservation interest

The proposed development will have no effect on any bryophyte assemblage of conservation interest.

Mitigation measures

No mitigation measures are considered necessary.

Significance of residual effects

There will be no significant adverse residual effects from proposed works on any legally protected bryophyte, species of conservation interest, or assemblage of conservation interest.

CONCLUSIONS

- The present report provides a comprehensive bryophyte survey and assessment of land at Port Talbot Docks.
- No species of conservation interest have previously been recorded within Port Talbot Docks.
- A total of 50 species of bryophytes were found during the present survey, including 48 mosses and two liverworts.
- No legally protected bryophytes, species of conservation interest or assemblages of conservation interest are present.
- No mitigation measures are considered necessary.
- There will be no significant adverse effects from proposed development on any legally protected bryophyte, species of conservation interest, or assemblage of conservation interest.

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APPENDIX 1 – BRYOPHYTE SPECIES LISTED BY LEGISLATION IN ENGLAND

Species	Habitats Directive Annex II	WAC Act S8	NERC Act S41
Acaulon triquetrum		x	x
Adelanthus lindenbergianus		x	
Anomodon longifolius		x	x
Aplodon wormskioldii			x
Atrichum angustatum			x
Bartramia stricta		x	
Bruchia vogesiaca	x		
Bryum calophyllum			x
Bryum cyclophyllum			x
Bryum gemmiparum			x
Bryum knowltonii			x
Bryum marratii			x
Bryum salinum			x
Bryum schleicheri		x	
Bryum warneum			x
Buxbaumia viridis	x	x	
Cephaloziella baumgartneri			x
Cephaloziella calyculata			x
Cephaloziella dentata			x
Cephaloziella integerrima			x
Cephaloziella nicholsonii			x
Ceratodon conicus			x
Cyclodictyon laetevirens		x	x
Dendrocryphaea lamyana		x	x
Dicranum spurium			x
Dicranum undulatum			x
Didymodon cordatus		x	
Didymodon glaucus		x	x
Didymodon tomaculosus			x
Ditrichum cornubicum		x	x
Ditrichum plumbicola			x
Ditrichum subulatum			x
Dumortiera hirsuta			x
Entosthodon pulchellus			x
Ephemerum cohaerens			x
Fissidens curvatus			x
Fissidens serrulatus			x
Fossombronia foveolata			x
Geocalyx graveolens		x	
Grimmia crinita			x
Grimmia elongata			x
Grimmia unicolor		x	
Gymnomitrion apiculatum		x	
Habrodon perpusillus			x
Hamatocaulis vernicosus	x	x	
Homomallium incurvatum			x
Hygrohypnum polare		x	
Hypnum vaucheri		x	
Jamesoniella undulifolia		x	x
Leiocolea rutheana		x	x
Leiocolea rutheana var. laxa		x	x

Species	Habitats Directive Annex II	WAC Act S8	NERC Act S41
Leiocolea rutheana var. rutheana		x	x
Lejeunea mandonii			x
Leptodontium gemmascens			x
Liochlaena lanceolata			x
Lophozia capitata			x
Marsupella profunda	x	x	x
Micromitrium tenerum		x	x
Mielichhoferia mielichhoferiana		x	
Orthodontium gracile			x
Orthotrichum obtusifolium		x	
Orthotrichum pallens			x
Orthotrichum pumilum			x
Pallavicinia lyellii			x
Petalophyllum ralfsii	x	x	x
Philonotis marchica			x
Physcomitrium eurystomum			x
Plagiothecium piliferum		x	
Pseudocalliergon turgescens		x	
Rhynchostegium rotundifolium		x	x
Rhytidiadelphus subpinnatus			x
Riccia bifurca		x	x
Riccia canaliculata			x
Riccia nigrella			x
Saelania glaucescens		x	
Scopelophila cataractae			x
Seligeria carniolica			x
Southbya nigrella		x	x
Sphaerocarpos texanus			x
Sphagnum balticum		x	x
Splachnum vasculosum			x
Telaranea europaea			x
Thamnobryum angustifolium		x	x
Thamnobryum cataractarum			x
Tortula cernua		x	x
Tortula cuneifolia			x
Tortula freibergii			x
Tortula vahliana			x
Tortula wilsonii			x
Weissia condensa			x
Weissia levieri			x
Weissia multicapsularis			x
Weissia squarrosa			x
Weissia sterilis			x
Zygodon forsteri		x	x
Zygodon gracilis		x	x

APPENDIX 2 – SPECIES INVENTORY

The below provides an inventory of bryophytes recorded within the survey areas. Taxonomy follows Blockeel et al. (2021).

CC No	Division	Family	Species	Survey area				
				1	2	3	4	5
L004.01	Marchantiophyta	Lunulariaceae	Lunularia cruciata	x	x			
L013.03	Marchantiophyta	Pelliaceae	Pellia endiviifolia	x				
M010.06	Bryophyta	Polytrichaceae	Polytrichum juniperinum	x				
M014.01	Bryophyta	Encalyptaceae	Encalypta streptocarpa	x	x	x		x
M015.01	Bryophyta	Funariaceae	Funaria hygrometrica	x				
M031.05	Bryophyta	Dicranellaceae	Dicranella varia	x			x	x
M050.01	Bryophyta	Ditrichaceae	Ceratodon purpureus	x	x	x	x	x
M055.02	Bryophyta	Pottiaceae	Trichostomum crispulum	x				x
M067.01	Bryophyta	Pottiaceae	Pseudocrossidium hornschuchianum	x	x		x	x
M068.01	Bryophyta	Pottiaceae	Bryoerythrophyllum recurvirostrum	x	x	x	x	x
M070.01.a	Bryophyta	Pottiaceae	Streblotrichum convolutum var. convolutum	x	x	x	x	x
M070.01.b	Bryophyta	Pottiaceae	Streblotrichum convolutum var. commutatum	x	x	x		x
M071.01	Bryophyta	Pottiaceae	Barbula unguiculata	x	x		x	x
M072.02	Bryophyta	Pottiaceae	Didymodon ferrugineus				x	
M072.04	Bryophyta	Pottiaceae	Didymodon fallax	x	x		x	x
M072.06	Bryophyta	Pottiaceae	Didymodon luridus	x			x	x
M072.07	Bryophyta	Pottiaceae	Didymodon tophaceus	x				
M072.08	Bryophyta	Pottiaceae	Didymodon nicholsonii	x				x
M072.10	Bryophyta	Pottiaceae	Didymodon insulanus	x	x		x	x
M072.13	Bryophyta	Pottiaceae	Didymodon rigidulus	x	x	x		x
M076.03	Bryophyta	Pottiaceae	Aloina aloides	x				x
M077.10	Bryophyta	Pottiaceae	Tortula muralis	x		x		x
M082.01.a	Bryophyta	Pottiaceae	Syntrichia ruralis var. ruralis	x	x	x	x	x
M082.04.a	Bryophyta	Pottiaceae	Syntrichia montana var. montana					x
M092.17	Bryophyta	Grimmiaceae	Schistidium crassipilum	x	x	x	x	x
M093.16	Bryophyta	Grimmiaceae	Grimmia pulvinata	x	x	x		x
M110.05	Bryophyta	Bryaceae	Bryum argenteum	x		x		x
M110.09	Bryophyta	Bryaceae	Bryum dichotomum	x				x
M110.39	Bryophyta	Bryaceae	Bryum archangelicum	x	x			x
M110.42	Bryophyta	Bryaceae	Bryum capillare	x	x	x		x
M110.48	Bryophyta	Bryaceae	Bryum pseudotriquetrum	x				
M110.52	Bryophyta	Bryaceae	Bryum rubens	x				
M122.07	Bryophyta	Orthotrichaceae	Orthotrichum diaphanum	x		x		
M150.01	Bryophyta	Amblystegiaceae	Cratoneuron filicinum	x		x	x	x
M152.02	Bryophyta	Amblystegiaceae	Campylium stellatum	x				
M157.02	Bryophyta	Amblystegiaceae	Drepanocladus aduncus	x				x
M180.01	Bryophyta	Brachytheciaceae	Pseudoscleropodium purum	x		x	x	x
M183.01	Bryophyta	Brachytheciaceae	Eurhynchium striatum					x
M184.04	Bryophyta	Brachytheciaceae	Rhynchostegium confertum	x				
M188.01	Bryophyta	Brachytheciaceae	Oxyrrhynchium hians	x	x			x
M189.01	Bryophyta	Brachytheciaceae	Kindbergia praelonga	x				x
M191.01	Bryophyta	Brachytheciaceae	Brachythecium albicans	x	x			x
M191.05	Bryophyta	Brachytheciaceae	Brachythecium mildeanum	x				x
M191.06	Bryophyta	Brachytheciaceae	Brachythecium rutabulum	x	x	x	x	x
M195.01	Bryophyta	Brachytheciaceae	Homalothecium sericeum			x		
M195.02	Bryophyta	Brachytheciaceae	Homalothecium lutescens	x	x	x	x	x

CC No	Division	Family	Species	Survey area				
				1	2	3	4	5
M196.01.b	Bryophyta	Hypnaceae	Hypnum cupressiforme var. lacunosum		x			
M201.01	Bryophyta	Pylaisiaceae	Calliergonella cuspidata	x	x	x	x	x
M210.01	Bryophyta	Hylocomiaceae	Rhytidiadelphus squarrosus					x
M218.01	Bryophyta	Cryphaeaceae	Cryphaea heteromalla	x				
			Total:	**44**	**22**	**19**	**17**	**36**

Annex E Invertebrate Assessment

INVERTEBRATE ASSESSMENT

Project Dragon, Port Talbot Docks

ECO02340
1

August 2023

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1 INTRODUCTION

1.1 Purpose

1.1.1 RPS was commissioned by LanzaTech UK Ltd to prepare an assessment of the invertebrate interest of the land parcels associated with the Project Dragon development, located within Port Talbot Docks.

1.1.2 Project Dragon comprises two permanent development areas: the Production Development Zone (PDZ), and the Marine Unloading/Loading Facility to the north of the PDZ. Three temporary construction areas are included in the planning application boundary (TCA West, TCA East and TCA1).

1.2 Scope of this report

1.2.1 This invertebrate assessment specifically covers the PDZ and TCA1.

1.2.2 The PDZ lies to the south of the internal dock road, Phoenix Way, and is a mosaic of regenerating willow scrub, and extensive stands Japanese knotweed with more localised areas of grassland, gorse scrub, bramble, bracken, and reedbed.

1.2.3 A Temporary Construction Area (TCA1) is located at the eastern end of the open water dock. This land parcel is a mix of sparsely vegetated bare ground and short regenerating grassland (Open Mosaic Habitat) with scattered young self-seeded scrub.

1.3 Context

Japanese Knotweed Control

1.3.1 The very extensive stands of Japanese knotweed occur in the PDZ and are subject to control measures in 2023 being undertaken by Associated British Ports (ABP) as part of the initiatives to eradicate this species from the dock landholding. A combination of crown stripping and herbicide treatment is being implemented in the PDZ to reduce the vigour of the plants.

1.3.2 Around the dense stands, Japanese knotweed continues to spreading into scrub, bramble and grassland habitats. In order to fully assess the extent of this invasive species and provide access for the control measures, the majority of the willow scrub, gorse and bramble was cut down to close to ground level in February 2023 along with the dead stems of the Japanese knotweed.

1.3.3 The removal of the scrub has significantly altered the nature of the habitat mosaic within the PDZ and consequently a precautionary assessment has been made of the potential invertebrate assemblage.

Past Surveys

1.3.4 Invertebrate survey data was collected for a 23ha land parcel within the docks, referred to as the Harbourside Site in 2021. The habitats in the PDZ and TCA1 have many close similarities with other parts of the wider Harbourside site which extends up to the western boundary of the proposed development.

Precautionary Data Comparison

1.3.5 The objective of the invertebrate assessment is to provide a precautionary definition of the predicted invertebrate value of the permanent development area PDZ and one of the temporary

construction areas, TCA1. The assessment draws from the results of the invertebrate survey undertaken for the Harbourside site in 2021 with reference to habitat similarities and differences.

1.3.6 Specific consideration has been given to:

- the assemblage and diversity of the different invertebrate species groups in the wider Harbourside site,
- recorded species with high conservation status and their habitat associations in the wider Harbourside site,
- habitat types and extents with the PDZ and TCA1 compared to the wider Harbourside site,
- the presence/absence of habitat features associated with invertebrate diversity including open water, banks, floristic diversity and habitat mosaics.

1.3.7 The information presented in this report defines the precautionary baseline conditions which will be used to inform the assessment of effects on invertebrates from the proposed development.

1.3.8 The close proximity and substantial cross-over of habitat types means that this approach should provide an accurate assessment of overall invertebrate diversity and value.

2 METHOD

2.1 Harbourside Site Survey, Port Talbot Docks

2.1.1 The invertebrate survey was completed for a 23ha Harbourside Site in 2021. The Harbourside site survey area is defined on Figure 1. It covered four of the five compartments (Areas A, B, C West and C East) which were divided according to their location, habitats and topographical features.

Survey Compartments

2.1.2 The southernmost area (Area A) and central area (Area C West) are predominantly flat and bounded by bunds/banks on the periphery with only a small amount of scattered scrub. The north-western area (Area B) is a former mineral extraction and much more topographically diverse with many steep slopes, a reedbed/waterbody and areas of seasonally inundated ground with a varied wetland flora.

2.1.3 The easternmost compartment (Area C East) is much more densely scrubbed over and is dominated by grey willow with patches of mixed species scrub and grassland. Area C East directly adjoins the PDZ development area and is in part, a continuation of the same scrub and grassland habitats.

Invertebrate Sampling

2.1.4 Representative samples were collected from each of the four compartments over three visits on 30 June, 29 July and 25 August 2021. The timing of the summer allowed good coverage across the mid and late summer period.

2.1.5 Every attempt was made to undertake the survey visits in warm, sunny and dry conditions, although access had to be arranged in advance. Survey visits were rearranged when the forecast was for poor conditions.

- 30 June 2021 – dry, warm and sunny with a light breeze; close to ideal conditions
- 29 July 2021 - dry and sunny, c25% cloud cover, c18°C, with cool westerly wind; relatively good conditions
- 25 August 2021 – dry but overcast with some sunny intervals later, c17°C, with a light breeze; average conditions

2.1.6 Sweep-netting (with a 40 cm diameter white-bag net) was the main technique used for sampling the habitat types in the different areas. Grassland, ephemeral vegetation and the foliage of scrub were all swept with the net while the surveyor walked transects through the habitat. The foliage of the willow scrub and mixed species scrub, bramble and scrub were also sampled along the margins.

2.1.7 The survey effort in each area related to the variability of the habitats with each of the main habitat types sampled during the survey. The compartments were approximately equal in size and were sampled for a similar length of time with the exception of Area B which took longer because of the greater variation in habitats/micro-habitats.

Analysis

Conservation Status

2.1.8 The definitions used by the JNCC for classifying the status of scarce invertebrates of Great Britain are defined below and are based on the degree of rarity and vulnerability to extinction.

Red Data Book Category 1. RDB1-ENDANGERED

- Taxa in danger of extinction if causal factors continue unabated. Includes species occurring as a single colony or only in habitats which are much reduced and highly threatened or which have shown a rapid and continuous decline.

Red Data Book Category 2. RDB2-VULNERABLE

- Taxa believed likely to move into the endangered category in the near future if the causal factors continue operating. Includes species of which most or all populations are decreasing and those which are confined to vulnerable habitats.

Red Data Book Category 3. RDB3-RARE

- Taxa with small populations that are not at present endangered or vulnerable, but are at risk; usually localised within restricted geographical areas or habitats or are thinly scattered over a wider range. Includes species estimated to exist in only fifteen or less post 1970 10km squares or, if more, then in vulnerable habitat.

Red Data Book Category 4. RDBK – Data deficient

- Taxa that are suspected, but not definitely known, to belong to any of the above categories, because of lack of information. Includes taxa recently discovered or recognised in Great Britain which may prove to be more widespread in the future; taxa with very few or perhaps only a single known locality but which belong to poorly recorded or taxonomically difficult groups; species known from very few localities but which occur in inaccessible habitats or habitats which are seldom sampled; species with very few or perhaps only a single known locality and of questionable native status, but not clearly falling into the category of recent colonist, vagrant or introduction.

Nationally Scarce Category a. Na

- Taxa which do not fall within the RDB categories but which are uncommon in Great Britain and are known to occur in 30 or fewer 10km squares or, in less well recorded groups, within seven or fewer vice-counties.

Nationally Scarce Category b. Nb

- Taxa which do not fall within the RDB categories but which are uncommon in Great Britain and are known to occur in between 31 and 100 10km squares or, in less well recorded groups, between eight and twenty vice-counties.

2.1.9 The first species classifications were published in the 1990's. Selected families have been updated and this process is ongoing, some families have only been updated very recently while for many groups the status of scarce invertebrates has not been subject to review since the original lists were published.

2.1.10 Additionally species of principal importance in Wales listed by Section 7 of the Environment (Wales) Act 2016 are also classified as species of conservation concern.

Species Assemblage Quality

2.1.11 The quality of the assemblage recorded in the Harbourside site survey compartments was assessed with reference to the overall species assemblage recorded in the samples; and the proportion of species that are defined as Red Data Book (RDB) species or those classified as being Nationally Scarce and Section 7 species of principal importance, although the latter is heavily skewed towards the butterflies and moths.

2.1.12 The proportion of Nationally Scarce and RDB species was used as a simple and readily comparable indication of quality. For most habitat types, a proportion of between 3 and 5% is an indication that a site has at least some conservation significance. Very high-quality sites of national importance will have a proportion close to or exceeding 10%.

2.2 Production Development Zone - Comparative Assessment of Habitats

2.2.1 Due to the removal of the majority of the scrub habitats, bramble and gorse by ABP to enable to full assessment of the extensive stands of Japanese knotweed ahead of crown stripping and herbicide treatments, it has not been possible to undertake an invertebrate survey of the PDZ in 2023. Consequently a precautionary assessment has been made of the potential invertebrate assemblage that the area supported prior to the start of the Japanese knotweed control works.

2.2.2 The habitats/features present in the PDZ have been compared against the different features in the other parts of the wider Harbourside site.

2.2.3 The species-habitat associations recorded in the docks have been assumed to be occur in the PDZ where equivalent habitat is present.

2.2.4 The habitat requirements of all the RDB and nationally scarce species recorded in the Harbourside site as a whole have been reviewed and compared against the habitat conditions and features in the PDZ prior to the cutting back of the willow scrub. Where there is broadly equivalent habitat in the PDZ, the presence of these species has been assumed.

Comparison of Habitat Types

2.2.5 Both Area C East and the PDZ have extensive areas of regenerating willow scrub dominated by young muti-stemmed grey willows. The two areas also support naturally regenerating grassland, mixed species scrub including gorse, bramble and bracken with small patches of more open ground. The habitats are found at a similar in scale in both areas, and have a largely equivalent structure and composition.

2.2.6 The areas grassland in the PDZ has a more varied composition than Area C East bit lack areas of rank grassland where coarse grasses dominate.

2.2.7 Japanese knotweed is only present in a few locations in Area C East compared to the densest stands in the PDZ which are c2ha in extent, and make up over 20% of the total area.

2.2.8 There main difference relates to topography. The whole of the PDZ is largely level ground with very few banks while Area C East has several bank features, many of which are over 100 years old relating to historic railway lines.

2.2.9 Additional habitats present in the PDZ are small stands of seasonally flooded common reed, a small areas of rabbit grazed coastal grassland, and a very small area of dune slack vegetation.

2.2.10 The invertebrate survey findings from other parts of the wider Harbourside site have been use to provide information on the habitat types not present in Area C East.

2.2.11 Overall, there are many close similarities between Area C East and the PDZ and it is expected that there will be a high level of overlap in the invertebrate species assemblages. In this context the invertebrate data collected for the Harbourside site is considered to provide an accurate representation of the potential invertebrate assemblage in the PDZ when a precautionary approach is applied.

3 RESULTS

3.1 Desk Study

3.1.1 Biological data provided by SEWBReC included records of 125 species within 2km of the Harbourside site, comprising ten species of conservation concern, 68 species of principal importance (Section 7) and 47 locally important species. Lepidoptera (butterflies and moths) made up the majority of the records.

3.1.2 There are records of three Section 7 species from the PDZ, brown banded carder bee *Bombus humilis*, small blue *Cupido minimus,* wall butterfly *Lasiommata megera* and the cinnabar moth *Tyria jacobaeae.*

3.1.3 The following locally important invertebrate species have been recorded within the PDZ in the past red tailed bumblebee *Bombus lapidarius*, early bumblebee *Bombus pratorum*, buff-tailed bumblebee *Bombus terrestris*, white tailed bumblebee *Bombus lucorum*, garden bumblebee *Bombus hortorum* and common carder bee *Bombus pascuorum*.

3.1.4 SEWBReC hold records of the S7 species shrill carder bee *Bombus sylvarum* from two locations on northern edge of dock.

3.1.5 Past records of invertebrates in Area C comprise the S7 species small heath *Coenonympha pamphilus*, grass rivulet *Perizoma albulata*, wall, brown banded carder bee, and small blue; plus the locally important species red-tailed bumblebee and buff-tailed bumblebee.

3.2 Invertebrate Assemblage

3.2.1 The breakdown of the species assemblages recorded in Areas A, B, C West and C East of the Harbourside Site in 2021 is presented in Table 3.1.

Table 3.1: Harbourside - Invertebrate Assemblage All Species

Invertebrate Orders	**Numbers of species**			
	C East	**C West**	**B**	**A**
Odonata (Dragonflies and damselflies)	3	2	5	1
Orthoptera (Grasshoppers and crickets)	5	5	4	3
Heteroptera (True bugs)	2	11	7	5
Auchenorrhyncha (Hoppers and aphids)	5	4	4	1
Lepidoptera (Butterflies and moths)	18	13	20	15
Coleoptera (Beetles)	20	14	10	5
Diptera (Flies)	69	52	77	41
Hymenoptera (Bees, ants and wasps)	32	20	29	12
Other Orders	2	1	4	2
TOTAL	**157**	**122**	**160**	**85**

3.2.2 For each invertebrate order an assessment has been made of the potential value of the PDZ and TCA1 with reference to habitat features present in these locations and diversity recorded in the wider Harbourside site.

Odonata (Dragonflies and Damselflies)

3.2.3 Two Odonata species were recorded in the Area C East with wetland habitats limited to seasonal flooding in an area of regenerating scrub woodland. Both species were also recorded in wider Harbourside site with the highest diversity associated with reedbed / wetland in Area B, a former mineral extraction, where five species were recorded.

3.2.4 Within the PDZ the smaller areas of seasonally flooded common reed have the potential to support Odonata species.

3.2.5 The areas of common reed dry out in summer. The stands of reed are more open in the PDZ, than in Harbourside Area B. It is not typical of high value reedbed grows on a low diversity carpet of moss and lacking permanent open water and with limited areas of dense reed growth.

3.2.6 Extensive shallow seasonal pooling on the central area of hardstanding rapidly dries out in spring with wetland habitat limited to a small area of dune slack vegetation.

3.2.7 Several of the habitat conditions in Area B are not present in the PDZ which lacks permanent open water and reedbed where several species were recorded. In comparison the deep water and vertical-sided engineered edges to the docks at Crown Wharf and Margam Wharf are unlikely to have value for populations of Odonata species, but the reedbed located between the two wharfs has good potential value.

3.2.8 The areas grassland and scrub within the PDZ will have provided a foraging habitat for species that disperse more widely from ponds. Under a precautionary basis it is assumed that at least adults of at two species of Odonata will forage in the PDZ and Phoenix Wharf, with potential for all the species recorded in the wider Harbourside site to occur (6 species).

3.2.9 Only one Odonata species was recorded flying over the very dry sparsely vegetated habitats in Area A. Although the habitats in TCA1 are similar to Area A its location next to the open water dock with a nearby reedbed means that several Odonata species could forage over this area.

Orthoptera (Grasshoppers and Allies)

3.2.10 Six species were recorded in Harbourside as a whole, all but one occurring in at least three of the four survey areas indicating that each species is widely distributed.

3.2.11 Speckled bush cricket, a common species associated with woodland edges as hedgerows and gardens, was only recorded in Area C East, while long winged conehead (formerly Nationally Scarce a) was not recorded in this part of the site.

3.2.12 On a precautionary basis it is assumed that all six species recorded will have occurred in PDZ.

3.2.13 Due to the extent of sparsely vegetated ground, the diversity of Orthoptera species is expected to be lower in TCA1 broadly equivalent to Area A where 3 species were recorded including the long-winged conehead.

Heteroptera (True bugs)

3.2.14 In total 12 species were recorded in the whole of Harbourside site, with only two found in Area C East. Species in this group have varied habitat requirements. Diversity was higher in areas of extensive grassland with 11 species recorded in Area C West and 8 species in Area B.

3.2.15 The presence of more established but still flower-rich grassland and mixed species scrub are likely to be a main factor affecting this diversity in Area C East, along with the lower diversity of even-aged regenerating grey willow.

3.2.16 The localised areas of grassland and mixed scrub margins in the PDZ would be expected to support a proportion of the assemblage recorded across the Harbourside site as whole, estimated to be at most 50%.

Auchenorrhyncha (Hoppers and aphids)

3.2.17 Five species were recorded in Area C East including one Nationally Scarce b species, *Euscelis ohausi,* which was only recorded in this part of the Harbourside site, associated with broom.

3.2.18 A second species, *Aphrophora alni*, was only recorded in Area C East but is generally widespread in the region. The adults primarily feed on deciduous trees, while the larvae prefer herbaceous plants, conditions that were not present in other areas of the Harbourside site.

3.2.19 A second Nationally Scarce b species *Paralimnus phragmitis* was only found in the reedbed in Area B. There is a low probability that this species could occur in the small areas of common reed in the PDZ.

3.2.20 The four other species recorded in the Harbourside site were found in more than one of the survey compartments.

3.2.21 For this invertebrate order the species assemblage in the PDZ is expected to be equivalent to Area C East. TCA1 is expected to have limited value for this invertebrate order with only one species was recorded in Area A.

Lepidoptera (Butterflies and Moths)

3.2.22 A good diversity of Lepidoptera were recorded across the Harbourside site, with a slightly higher number of species recorded in Area C East where there was more extensive edge habitat where the scrub adjoins both coarse and open grassland. The shrubs also provides a high degree of shelter compared to the majority of the Harbourside site.

3.2.23 11 of the 18 species were only recorded in Area C East. This included a nationally scarce species *Scythris picaepennis* which is typically associated with dry sandy or chalky grassland and was recorded in all four survey compartments, indicating it is widely distributed within the docks.

3.2.24 Three other nationally scarce species were recorded in the wider Harbourside site. *Chionodes distinctella* was only recorded in Area B and is associated with vegetation on dry, rocky ground, and verges. Area B supports the most optimal habitat for this species.

3.2.25 *Ochsenheimeria taurella* was also only recorded in Area B and is associated with coarse grasses. This type of habitat is present across the Harbourside site but is absent from the PDZ.

3.2.26 *Thiodia citrana* is associated with grassland where the larvae feed on the flowers and seeds of yarrow *Achillea millefolium*, field wormwood *Artemisia campestre* and stinking camomile *Anthemis cotula.* It was only recorded in Area A but could occur in any of the grassland areas within docks where one of these plant species is present.

3.2.27 Two of the six Section 7 Lepidoptera species recorded in the Harbourside site were found in Area C East; wall butterfly *Lasiommata megera* and the very widespread cinnabar moth *Tyria jacobaeae*. Both species will occur in the PDZ.

3.2.28 Individual small heath *Coenonympha pamphilus* butterflies has also be recorded in several areas and has been noted in the PDZ. Small heath, which is typically associated with grassland comprising fine grasses in dry, well-drained situations where the sward is short and sparse;

3.2.29 Colonies of small blue *Cupido minimus* were recorded in coastal grassland and bunds in Areas A, B and C West, but was not recorded in Area C East. This species utilises sheltered south-facing sparse grassland with populations of kidney vetch and are associated with calcareous grassland,

abandoned quarries, railway embankments and woodland edges. With very little kidney vetch in the PDZ, it is unlikely that the area has importance for small blue.

3.2.30 Two other Section 7 species recorded in the docks have the potential to occur in the PDZ: the shaded broad bar moth *Scotopteryx chenopodiata*, associated with a range of open habitats including grassland, woodland rides, and sand dunes; and the sallow moth *Xanthia icteritia* which is associated with broadleaved woodland, marshes and fens.

3.2.31 The diversity recorded in Area C East provides a good indication of the range of species in the PDZ but it has the potential to support a higher diversity of species due to the extensive scrub/grassland edge habitat with 20+ species possible.

3.2.32 The species diversity in TCA1 would be expected to be broadly equivalent to Area A but the assemblage would differ with more sparsely vegetated ground, and more extensive scattered scrub. Areas of flower-rich vegetation create a significant source of pollen and nectar. Small blue has been recorded with their foodplant kidney vetch locally abundant.

Coleoptera (Beetles)

3.2.33 There was significant variation in the assemblage of Coleoptera recorded across the Harbourside site. Of the 30 Coleoptera species recorded in total, 20 were only found in one of the survey areas.

3.2.34 Diversity was very low in Area A were only 5 species were recorded on the largely flat sparse vegetation ground. In comparison, 20 species were recorded in Area C East of which 10 were only recorded elsewhere within the survey area. This included *Meligethes fulvipes* a small rove beetle associated with decaying organic matter.

3.2.35 The nationally scarce species recorded in Area C East were *Polydrusus formosus* associated with a wide range of broadleaf trees, and *Hippodamia variegate* which was recorded in all areas and is associated with ruderal, weedy plants on sandy, open soils and substrates.

3.2.36 The PDZ would be expected to have supported 20+ species including at least one with a National Scarce status.

3.2.37 The assemblage in TCA1 would be expected to be broadly equivalent to Area A with under 10 species.

Diptera (Flies)

3.2.38 A large number of Diptera species were recorded in the Harbourside site. The highest diversity was recorded in Area B (77 species) with slightly less in Area C East (69). The number of species in Area A was much lower with a total of 41 species.

3.2.39 A total of 10 RDB nationally scare or provisionally nationally scarce species were recorded across Harbourside as a whole, with five of these recorded in Area C East.

One of these species was only found in Area C East *Sapromyza albiceps*, associated with grassland habitats. *Pherbellia knutsoni* was found in Area C East as well as C West and Area B associated the coastal dunes and is also assumed to have occurred in the PDZ. *Clistoabdominalis ruralis* was found in Areas East, C West and B and associated with scrub/woodland edge habitat *Eudorylas zermattensis* was found in all four areas which is associated with a range of habitats including coastal and calcareous grassland

3.2.40 All five of these species are also assumed to be present in the PDZ.

3.2.41 Four Diptera species were only found in Area B. *Trachysiphonella scutellata* is associated with reedbeds, ditches, open water bodies, fen areas, carr woodland, *Sciapus laetus* associated with brackish marshlands, coastal dunes, and open dry grassland, *Micropeza lateralis* generally

associated with grassland habitats, and *Sapromyza quadricincta* which has varied habitat associations, but often found on trees and shrubs on post industrial land. All four species could also occur in the PDZ, although the extent of wetland and grassland is considerably smaller.

3.2.42 The two other scarce species were *Herina palustris* and *Pherbellia griseola* were recorded in dry sandy habitats but were not recorded in Areas C East. *Pyratula perpusilla* was only recorded in Area C West. associated with wetland, coastal grazing marsh, brackish pools, pool margins and in swamps.

3.2.43 Based on the habitat associations it is assumed that the PDZ supports a wide range of Diptera species (70+) including the majority of the national scarce Diptera species recorded elsewhere in the Harbourside site as a whole.

Hymenoptera (Bees, wasps, ants)

3.2.44 In total, 32 Hymenoptera species were recorded in Area C East, of which 19 were only recorded in this part of site. In comparison 29 species were recorded in Area B, 20 in Area C West and only 12 in Area A.

3.2.45 The significant level of variation between the different areas is illustrated by 33 species being recorded in only one of the four areas and only 6 species present in at least three of the survey areas. More diverse species assemblages were recorded in both Area C East and Area B.

3.2.46 The assemblage comprised 30 bee species one of which is Nationally Scarce b *Sphecodes ferruginatus*, and 20 species of ichneumon wasps, two of which are nationally scarce *Zatypota albicoxa* and *Anisobas cingulatellus*, both only recorded in Area C East.

3.2.47 *Sphecodes ferruginatus* (dull headed wasp) was only recorded in Area C West is a cleptoparasite of small bee species *Lasioglossum fulvicorne* usually found in banks in calcareous habitats.

3.2.48 A further national scarce species *Gorytes laticinctus* is associated rough vegetation and bramble in heathland, scrub, coastal dunes, coastal landslips and soft rock cliffs.

3.2.49 The high species diversity in Area C East was partly due to the inclusion of a c750m^2 steep, south-facing, sparsely vegetated soil bank on the boundary with the Tata steel operational area. Both nationally scarce ichneumon wasps were only recorded in Area C East.

3.2.50 Due to the absence of sparsely vegetated ground and absence of banks, the diversity in the PDZ is expected to be lower than recorded in Area C East and Area B. Due to the similar flat topography the overall assemblage of Hymenoptera in the PDZ is predicted to be similar to Area C West.

4 DISCUSSION

4.1 Harbourside Site

4.1.1 Areas B and C West encompass most of the important habitats for invertebrates within the surveyed Harbourside site. Area B is of highest importance with total of eight key species not recorded in the other parts of the Harbourside site, in part because of the presence of wetland habitats.

4.1.2 Although Area C West has a smaller range of habitat types (primarily a mix of open and closed grassland) the species assemblage had high quality with four key species recorded here but not in other survey compartments. The percentage of key species was only slightly lower than in Area B.

4.1.3 Fewest species were recorded in Area A comprising a level area of ground with very open vegetation cover with localised areas of closed grassland. Only one key species was found to only occur in this area. The lack of diversity in habitat types and topography is considered to be a significant factor limiting the assemblage of species recorded.

4.1.4 Area C East has a close equivalence to the PDZ but is in many ways different character from the other parts of the Harbourside site surveyed in 2021. The features found in the PDZ which were recorded to support invertebrate diversity in Area C East

- scrub/grassland margins,
- mixed species scrub including gorse and broom,
- open grassland.

4.1.5 The PDZ is larger being c9ha compared to Area C East which is approximately half the size. The PDZ habitats include extensive stands of dense Japanese knotweed making up approximately 20% of the area, and as a habitat comprising a single non-native species it is considered to have low value for invertebrates.

4.2 Production Development Zone

Invertebrate Habitats

Scrub and Margins

4.2.1 The regenerating willow shrubs in the PDZ is typically younger than the scrub woodland in Area C East with a lower canopy height and an often sparsely vegetated ground flora.

4.2.2 In Area C East the scrub woodland associated with the historic railway embankments is longer established; goat willow is a more substantial component, and bramble is abundant below the canopy with occasional woodland herbs.

4.2.3 The extent of scrub edge habitat was higher in the PDZ than Area C East along with the number of sheltered grassland clearings.

4.2.4 On balance, based on similarities and differences in habitat conditions it is anticipated that the diversity of invertebrates using the regenerating willow scrub and edge habitats will be broadly equivalent to Area C East.

Grassland

4.2.5 The grassland habitats enclosed by the scrub habitats are broadly equivalent to the more established grassland in Area C East with similar scrub edge context. The grassland in the glades is generally less open with lower diversity and abundance of wildflowers. Dewberry is abundant as

low growing cover within areas of grassland creating a more closed structure with fewer patches of unshaded bare ground with the sward.

4.2.6 Shading from willows also create different conditions from those found in the expanses of open unshaded grassland in Areas B and C West. Bramble is becoming dominant in areas that were formerly as grassland becomes scrubby through natural succession.

4.2.7 The shading from the scrub means that there are few open habitats with sunny south-facing aspect where high diversity was noted in during the survey of the wider Harbourside site.

4.2.8 Much of the woodland edge in Area C East is south-facing with gradation from tall coarse grasses to shorter grassland and sparsely vegetated ground creating a combination features of value to species that depend on more than one habitat type/structure.

4.2.9 Many of the species in wider Harbourside site associated with the open grassland habitat types are also assumed to occur in the PDZ.

Banks

4.2.10 The largely flat topography and an absence of banks means that a number of the species found in the Harbourside site are unlikely to occur in the PDZ development area which excludes the railway embankment.

4.2.11 The Area C East survey area has low, steep, south-facing patchily vegetated banks with no equivalent feature in the PDZ.

4.2.12 A north-facing railway embankment with ballast substrate and scattered scrub adjoins the southern boundary, outside the application site.

Other Habitats

4.2.13 Additional features in the PDZ are stands of seasonally waterlogged common reed and a very small area of dune slack vegetation. Although there is negligible permanent open water habitat it is assumed that some of the species recorded in reedbed in Area B will also occur in the PDZ.

4.2.14 Due to the very small extent of dune slack vegetation - c40m^2, the number of populations of invertebrates that could be sustained by this isolated seasonally flooded habitat will be restricted.

4.2.15 With some seasonally waterlogged ground in Area B, it is assumed that some species that were only found in Area B during the 2021 survey will also utilise occur in smaller seasonally waterlogged habitats in the PDZ.

Predicted Invertebrate Diversity

4.2.16 A total of 157 invertebrate species were recorded in Area C East over the three survey visits in 2021, which was a very good diversity for relatively uniform habitat types with extensive scrub dominated by even aged grey willow.

4.2.17 The diversity in Area C East was associated with the willow scrub/grassland margins, mixed species scrub including gorse and broom, open grassland and south-facing bank. The range of slopes and banks relate to previous industrial activities and the historic railway lines and the boundary with the Tata Steelworks which made a significantly contribution to the diversity recorded.

4.2.18 Overall the PDZ is predicted to have an equivalent diversity than Area C East or slightly higher under a precautionary assessment it is estimated that between 155 - 165 species. In each area of the Harbourside site, the ratio of species with conservation status is between 7-8%. Although Area

C East had a relatively high total diversity the percentage of these species was slightly lower than the other three areas with a total of 12, equating to 7% of the recorded assemblage. Notably five of these species were only found in this area.

4.2.19 This is a conservative estimate taking into account the extent of Japanese knotweed, absence of bank features in the PDZ and homogeneity of the regenerating grey willow scrub as well as recognising that a small proportion of the species assemblage using the PDZ will not have been recorded in Harbourside site in the 2021 survey.

4.3 Temporary Construction Area

Predicted Invertebrate Diversity

4.3.1 TCA1 comprises flat ground with open structured grassland, sparse vegetation and localised areas of open flower-rich vegetation growing on previous developed land that has disturbed in the recent past with many similarities to Area A.

4.3.2 Although TCA1 is much smaller than Area A (c1.7ha compared to 6.2ha), under a precautionary approach the species diversity is expected to be broadly equivalent with differences in the species composition.

4.3.3 A total of 85 species were recorded in Area A and a smaller number of key species but equated to 9% of the assemblage.

4.3.4 Under a precautionary assessment the total species diversity in TCA1 is expected to between 50 and 70 species given its small size and the absence of any boundary grassland banks but taking into account the areas of flower-rich vegetation. The percentage of species of conservation concern is likely to be in the region of 9% (5 to 6 species).

4.4 Geographical Importance

4.4.1 Surveys in recent years of other post-industrial sites located close to the coast have shown that these habitats can have very significant conservation value.

4.4.2 Across the Harbourside site as a whole, the species of conservation concern form an average of 8.2% of the total assemblage.

4.4.3 The percentage of rare and scarce species at other surveyed post-industrial sites in South Wales is between 8 and 9% indicating that Port Talbot Docks is equivalent to similar locations in the region. At the Harbourside site the percentage of Red Data Book species was 1.6%, lower than the average recorded at other surveyed post-industrial sites where the RDB species are typically over 2% of the assemblage.

4.4.4 The diversity recorded in the different invertebrate Orders at the Harbourside site is broadly equivalent to the similar coastal industrial sites in South Wales with the exception of Hymenoptera. Many species in this Order favour, dry sites with high insolation including species that are active early in the year when ambient temperatures are still relatively low. Consequently, Hymenoptera diversity is considered to have been under recorded in the 2021 survey.

5 CONCLUSION

5.1.1 The habitats in the PDZ have broad similarity to many of the features in Area C East which provides the closest comparison. Within the wider Harbourside survey area, Area B and Area C West encompassed most of the important habitats. Areas C East was classified as being of relatively lower quality, based on the smaller proportion of Nationally Scarce species but still supported a good diversity of invertebrates.

5.1.2 Using a precautionary assessment it is assumed that the PDZ development area will support a good invertebrate diversity similar to the assemblage recorded in adjoining habitats in 2021 (Area C East) where grey willow dominated scrub and grassland edge habitat are the principal habitat components.

5.1.3 In this area, a total of 157 species were recorded of which 10 are species with conservation status (Red Data Book, Nationally Scarce) plus two Section 7 species. Overall, it is estimated that the PDZ will support between 155 - 165 species including a number species that were not recorded in other parts of the Harbourside site in the 2021 survey.

5.1.4 The percentage of these key species in Area C East was slightly lower than in other Harbourside site survey compartments. The much smaller extent of open flower-rich grassland and open mosaic habitat is likely to have influenced this result.

5.1.5 The proportion of species with conservation status in the PDZ is estimated to be between 8-9%, equivalent to Harbourside site as a whole and a higher proportion than Area C East. Of the 26 key species, five were only recorded in Area C East reflecting the limited extent of south facing scrub edge habitat in the other parts of the Harbourside site.

5.1.6 TCA1 is located on previous developed land and although much smaller in extent shares many similarities with Area A. A total of 85 species were recorded in Area A with key species making up 9% of the assemblage. Under a precautionary assessment a total of between 55 and 70 species is expected in TCA1 with a similar percentage of key species. It is anticipated that there will be some species associated with pioneer habitats will not have been recorded elsewhere in the Harbourside site.

5.1.7 Mitigation for invertebrates will be required to offset damage or loss of habitats in the PDZ. Where full mitigation cannot be achieved within the development boundary footprint, then alternative options should be delivered in the wider docks or through off-site compensation.

FIGURES

Notes
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Legend

Site Boundaries

Rev	Description	By	CB	Date

MAKING COMPLEX EASY

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Client: LanzaTech UK Ltd

Project: Project Dragon

Title: Harbourside Areas Plan

Status	Drawn By	PM/Checked By
Final	HM	TO
Project Number	**Scale @ A3**	**Date Created**
ECO02340	1:4,500	MAY 2023
Figure Number		**Rev**
1		-

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Legend

- Application Boundary
- Bare Ground/Sparsely Vegetated Ground
- Rubble
- Bracken
- Bramble Scrub
- Bramble Scrub and Japanese Knotweed
- Broadleaved Woodland
- Scrub Woodland (Grey Willow)
- Buildings
- Dune Slack Vegetation
- Dense Scrub
- Ephemeral Vegetation
- Gorse Scrub
- Hardstanding
- Ivy/Bramble/Scattered Scrub
- Japanese Knotweed
- Line of trees - Broadleaved
- Mature Conifer Tree Line
- Naturally Regenerating Grassland
- Naturally Regenerated Grassland (Semi-improved)
- Non-Ruderal (Ivy and Ferns)
- Non-native - invasive species
- Reedbed
- Scattered Scrub
- Scattered Trees
- Standing Water
- Open Water
- Scattered scrub
- Scattered tree - broadleaved
- Security Fence

Rev	Description	By	CB	Date

MAKING COMPLEX EASY

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Project: Project Dragon SAF Production Facility

Title: Habitat Plan

Status	Drawn By	PM/Checked By
DRAFT	HM	TO
Project Number	**Scale @ A3**	**Date Created**
ECO02340	1:3,000	AUG 2023
Figure Number		**Rev**
2		-

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APPENDICES

Appendix A

Harbourside Site – Species with Conservation Status

Appendix A: Key Species (RDB, Nationally Scarce and Section 7)

Order: Family	Species	Common name	National Status	Harbourside Site			
				A	B	C East	C West
Orthoptera: Conocephalidae	*Conocephalus discolor*	Long-winged Conehead	None (Formerly Nationally Scarce a)	X	X		X
Auchenorrhyncha: Cicadellidae	*Paralimnus phragmitis*		Nationally Scarce b		X		
Auchenorrhyncha: Cicadellidae	*Euscelis ohausi*		Nationally Scarce b			X	
Lepidoptera: Ypsolophidae	*Ochsenheimeria taurella*	a moth	Nationally Scarce b		X		
Lepidoptera: Gelechiidae	*Chionodes distinctella*	a moth	Nationally Scarce a		X		
Lepidoptera: Scythrididae	*Scythris picaepennis*	a moth	Nationally Scarce b	X	X	X	X
Lepidoptera: Tortricidae	*Thiodia citrana*	a moth	Nationally Scarce b	X			
Lepidoptera: Nymphalidae	*Lasiommata megera*	Wall	BAP			X	
Lepidoptera: Nymphalidae	*Coenonympha pamphilus*	Small Heath	BAP		X		
Lepidoptera: Lycaenidae	*Cupido minimus*	Small Blue	BAP		X		
Lepidoptera: Geometridae	*Scotopteryx chenopodiata*	Shaded Broad-bar	BAP	X	X		
Lepidoptera: Erebidae	*Tyria jacobaeae*	Cinnabar	BAP	X	X	X	
Lepidoptera: Noctuidae	*Cirrhia icteritia*	Sallow	BAP		X		
Coleoptera: Nitidulidae	*Meligethes fulvipes*		Nationally Scarce			X	
Coleoptera: Coccinellidae	*Hippodamia variegata*	Adonis' Ladybird	Nationally Scarce b	X	X	X	X
Coleoptera: Mordellidae	*Mordellistena pseudopumila*		RDBK		X		
Coleoptera: Curculionidae	*Polydrusus formosus*		Nationally Scarce a			X	
Diptera: Keroplatidae	*Pyratula perpusilla*		Nationally Scarce (formerly RDB3)				X
Diptera: Dolichopodidae	*Sciapus laetus*		Nationally Scarce		X		
Diptera: Pipunculidae	*Clistoabdominalis ruralis*		Nationally scarce (formerly RDB1)		X	X	X
Diptera: Pipunculidae	*Eudorylas zermattensis*		None (Formerly Nationally Scarce a)	X	X	X	X
Diptera: Micropezidae	*Micropeza lateralis*		pNationally Scarce		X		
Diptera: Ulidiidae	*Herina palustris*	a picture-winged fly	pNationally Scarce	X	X		X
Diptera: Lauxaniidae	*Sapromyza albiceps*		pNationally Scarce			X	
Diptera: Lauxaniidae	*Sapromyza quadricincta*		pNationally Scarce		X		
Diptera: Sciomyzidae	*Pherbellia griseola*		Nationally Scarce				X
Diptera: Sciomyzidae	*Pherbellia knutsoni*		RDB3		X	X	X
Diptera: Chloropidae	*Trachysiphonella scutellata*		None (Formerly Nationally Scarce a)		X		
Hymenoptera: Ichneumonidae	*Anisobas cingulatellus*	an ichneumon	None (Formerly Nationally Scarce)			X	

Hymenoptera: Ichneumonidae	*Zatypota albicoxa*	an ichneumon	None (Formerly Nationally Scarce)			**X**	
Hymenoptera: Crabronidae	*Gorytes laticinctus*	a digger wasp	RDB3			**X**	
Hymenoptera: Apidae	*Bombus humilis*	Brown-banded Carder Bee	BAP		**X**		
Hymenoptera: Halictidae	*Sphecodes ferruginatus*	Dull-headed Blood Bee	Nationally Scarce b				**X**
		Total Diversity	**317**	**85**	**160**	**157**	**122**
		RDB		0	2	1	1
		Nationally Scarce a		0	1	1	0
		Nationally Scarce b		3	6	5	6
		P Nationally Scarce		1	3	1	1
		None (former key species)		2	3	2	2
		All scarce/RDB	**26**	**6**	**15**	**10**	**10**
		Section 7 Species		2	6	2	0