

# Project Dragon

## Green Infrastructure Statement

February 2024

### Introduction

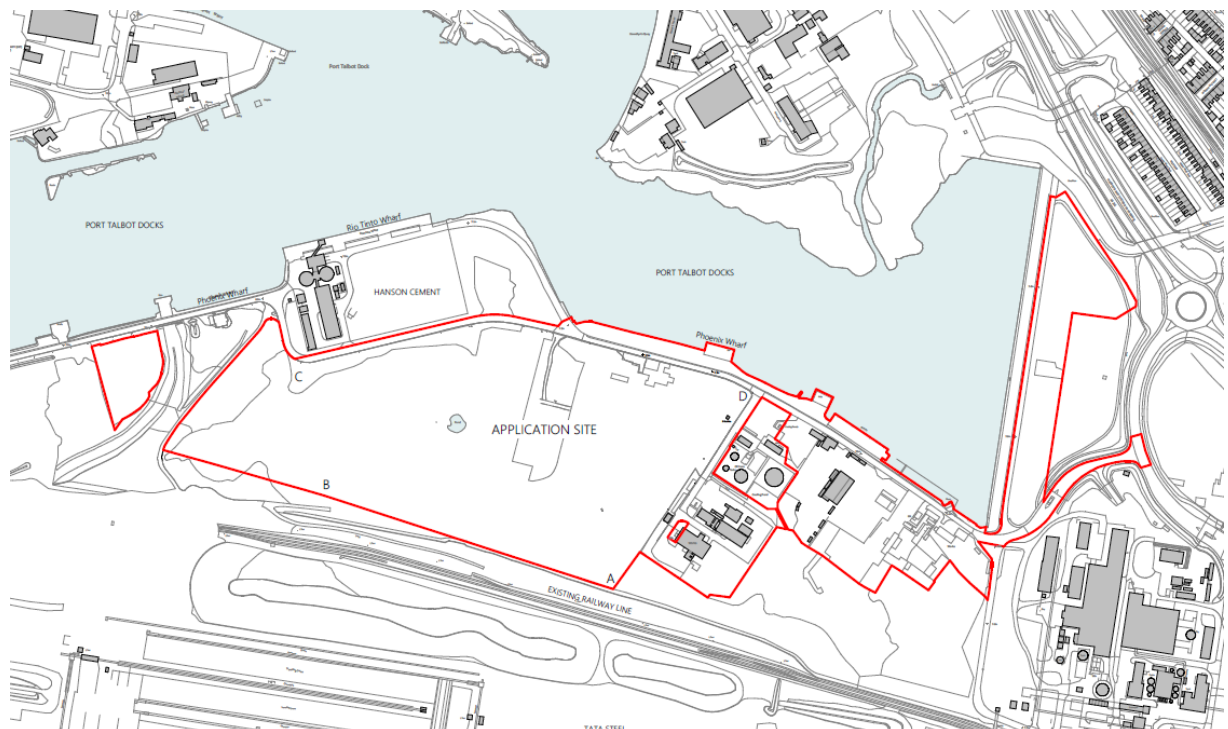
1. This Green Infrastructure Statement (GIS) has been prepared by Turley in collaboration with RPS and EDP. It has been prepared on behalf of LanzaTech UK Ltd (the Applicant). It supports a full planning application for the erection of a Sustainable Aviation Fuel (SAF) production facility at Crown Wharf, Port Talbot Docks (ref. P2023/0858).

2. The description of development is as follows:

*“Demolition of existing structures and erection of a Sustainable Aviation Fuel (SAF) production facility, including the production of green hydrogen and sustainable diesel, enclosed ground flare, storage tanks, installation of pipework and electrical, processing and utility equipment, administration, warehouse and laboratory buildings, new access, car parking and transport infrastructure including a truck loading area and associated works, hard and soft landscaping, areas for temporary construction laydown, and associated development.”*

3. The Site Location Plan is provided at **Figure 1** below. It comprises the main operational site Production Development Zone (PDZ) and temporary construction areas (TCAs).

**Figure 1: Site Location Plan**



4. This GIS seeks to clarify the approach to the development in line with the updated Planning Policy Wales (PPW) Chapter 6 (October 2023). It demonstrates the green infrastructure provided on site and the step-wise approach followed. The GIS draws on detail already set out in the supporting ecological reports and assessment, arboricultural note and landscape plans prepared for the application.
5. The GIS is structured as follows:
  - Background;
  - Site Selection;
  - Baseline Data and Surveys;
  - Step-wise Approach; and
  - Conclusion and Planning Balance.

## **Background**

6. Chapter 6 of PPW was updated on 18 October 2023. The updates were published in a Chief Planning Officer letter with immediate effect. These include the need for all planning applications to be accompanied by Green Infrastructure Statements (paragraph 6.2.5).
7. The proposal was developed in a way which aimed to respond to the relevant policies at the time. These include Policy BE1 (Design) of Neath Port Talbot Local Development Plan (2011-2026), Policy 9 (Resilient Ecological Networks and Green Infrastructure) of Future Wales: The National Plan 2040 and the placemaking principles set out in PPW (Edition 11).
8. Extensive pre-application engagement was undertaken with Neath Port Talbot Council (NPTC) and Officers throughout 2022 and early 2023 to develop the proportionate approach to biodiversity at the site, and where necessary offsite, prior to PPW updates. The proposed approach to biodiversity, ecology and landscaping at the application site is detailed in full within the supporting Environmental Statement (ES) and planning application documents.
9. The proposed development will act as the first development in the delivery of Associated British Ports' (ABP) Future Ports Programme and the Celtic Freeport. This includes the creation of a wider zero-carbon manufacturing cluster. It represents an opportunity to facilitate development on prominent, underutilised brownfield land with limited existing green infrastructure. LanzaTech is working closely with ABP on all matters relating to the delivery of the proposed development, including compensation measures at the off-site compensation site at Earlswood, Jersey Marine.
10. It would not be appropriate to address the updates made to PPW in a wholly comprehensive way given the significant progress made on the preparation of the planning application before the publication of the update. Pre-application consultation for the proposed development concluded on 13 September 2023 and the full planning application was submitted on 9 November 2023.
11. This GIS report seeks to clarify the approach to Green Infrastructure proposed by the Applicant, taking account of the stepwise approach in a way which is proportionate to the scale and nature of the proposed development. It has due regard to the progress made on the proposed development prior to the publication of the Chapter 6 update.

## Site Selection

12. The site selection process for the proposed development was undertaken several years (2021) before the stepwise approach was introduced in PPW.
13. Several key considerations influenced the approach to the site selection process, including LanzaTech's operational requirements, scale of site and proximity to major transport corridors (including via ship and road). Ecology and biodiversity were key considerations from the outset and statutory designated sites were excluded from the site selection process. The site selection criteria are detailed in **Section 3** of the Planning Statement and **Chapter 5: Consideration of Alternatives** of the ES.
14. The principle of development is established in this location. The wider area forms established industrial land. The site has been allocated for development over a prolonged period<sup>1</sup>. It will utilise the existing harbour for the transportation of materials and products, promoting use of this existing facility in line with wider ABP Future Ports Programme and Celtic Freeport ambitions. It will complement the wider sustainable regeneration of the docks and further developments of this nature.
15. The site comprises historically industrial land which has been re-greened over a significant period. It sits within the industrial context of the wider area and is an important parcel of land for industrial regeneration. It benefits from excellent vehicular access from the M4. Port Talbot Docks lie approximately 25m to the north of the PDZ. The site is not designated for protection. The site represented the optimal available location within the port against all criteria.
16. The proposed development in the PDZ is sited on most extensive stand of Japanese Knotweed (JKW) within Port Talbot Docks. Site selection provides the opportunity to remove this area of contamination with ongoing control to address any initial regrowth. The siting of TCAs where there are smaller stands of JKW also enables the eradication of adjoining stands of this invasive species. The presence of JKW presents a threat to habitats outside the site. Eradication through the development proposals removes the potential for the plant to be disturbed and establish new stands in habitats where it is absent.
17. The application site is dominated by immature scrubland, primarily comprising self-seeded specimens of Goat Willow, Birch, Alder, Hawthorn and Sycamore. Within the site boundary, by far the greater majority of these were identified as 'C-grade' within the BS5837 Tree Survey undertaken. Only a small group of B-grade Leylandii Cypress (G16) and a small group of B-grade Willow (G77) lie within the construction zone for the site and will require removal. All other removals will be of lower quality.

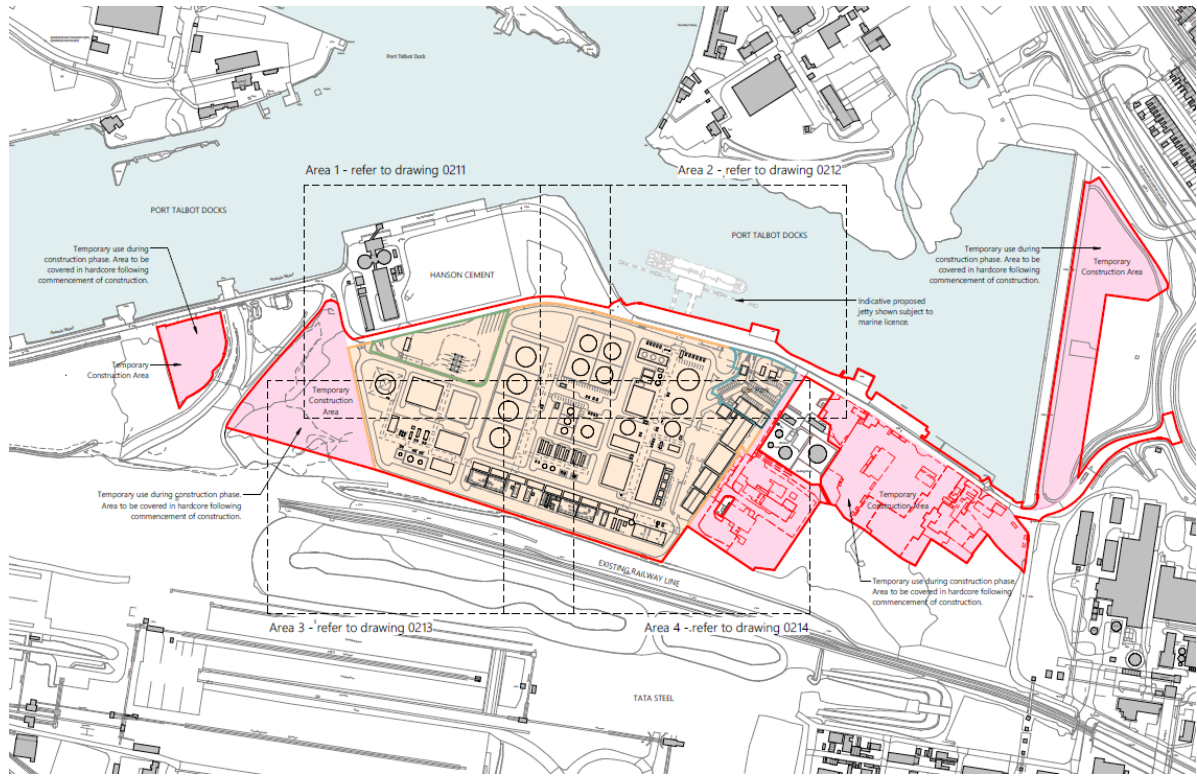
### ***Temporary Construction Areas (TCAs)***

18. TCAs are required as part of the construction phase of the proposed development. These will be utilised for approximately 2.5 years. These are shown in **Figure 2**.

**Figure 2: Proposed Site Plan showing PDZ and TCAs**

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<sup>1</sup> Policy TR4.2 of the LDP identifies the site as part of a wider 'Safeguarded Freight Facility' allocation.



19. Land availability and the need to deliver and coordinate planning for Project Dragon in the context of the emerging Celtic Freeport masterplan is an important consideration. It is vital from a coordination and deliverability perspective for Project Dragon. The Celtic Freeport will come forward in separate development parcels and at different times. The finite amount of available land means that the provision of TCAs for each plot is particularly constrained.
20. There is no option to allocate further temporary construction land for Project Dragon in the delivery timescales required for the project. The TCAs chosen are proportionate to scale required for the development. The TCAs need to be located within proximity to the site due to LanzaTech's functional requirements during the construction phase. The TCAs have been defined by the land available and offered by ABP, as the surrounding land is owned by ABP.
21. Two of the TCAs are located on previously developed land (TCA East and TCA 1 North). These TCAs are either still operational or have been substantially disturbed within the last 12 years. The third (TCA West) adjoins the permanent development and is in part on bare ground and stands of JKW.
22. In summary, the combination of land availability, functional requirements within the operational phase and key considerations such as ecology matters defined the site selection for the TCAs.

### Baseline Data and Surveys

23. The following surveys and assessments were prepared and submitted in support of the planning application:
  - Arboricultural Baseline Note, prepared by EDP (ref. edp7470\_r002e);
  - Green Infrastructure and Landscape Plan, prepared by EDP (ref. edp7470\_d010o);
  - Ecological Impact Assessment, prepared by RPS (ref. ECO02340) and accompanying appendices comprising reports/survey data;



- Outline Drainage Strategy (Version F) and accompanying appendices; and
- Environmental Statement, prepared by Turley, and the relevant appendices comprising reports/survey data, prepared by third-party consultants.

24. These documents are drawn upon to clarify Green Infrastructure detail throughout this Statement.

## **Operational Factors Effecting Biodiversity and Landscape Design**

### **COMAH Regulations**

25. Opportunities for the provision of habitat and landscaped areas are limited across the whole of the PDZ. The proposed development comprises the production of Sustainable Aviation Fuel and are subject to the requirements of the Control of Major Accident Hazards (COMAH) Regulations. These regulations ensure that operational sites take all necessary measures to prevent major accidents involving dangerous substances and limit the consequences to people and the environment should a major accident occur.
26. One of the key considerations in the PDZ under the regulations is the avoidance of creating fire hazards within the design including from the habitats present around the site. Environmental Resource Management (ERM) have undertaken preliminary modelling of risks including fire to provide guidance on where the provision of landscaping within the site will be compatible with operations.
27. Design constraints include the avoidance of any planting/green areas within zones of raised thermal radiation around the facility operating/processing areas. The location of individual habitat areas has therefore been constrained to permitted areas of vegetation/habitats. Furthermore, the size of habitats has also been limited so that they do not have the potential to contribute to the spread of fire in case of any incident at the facility.
28. In accordance with the specialist advice provided by ERM, the areas of vegetated habitat in the operational site are only sited towards the western, northern and eastern boundaries of the PDZ and are sub-divided into small blocks. Although relatively small in the extent, the habitats/landscaping within the PDZ maximises the extent of possible on-site habitat creation.
29. The Project Dragon site is in a private and restricted dock operated by ABP. Alongside the implications of the COMAH regulations, the location results in important restrictions on public access and/or means of movement by alternative modes other than public transport for strict safety reasons. The planned comprehensive redevelopment of the dock through the Celtic Freeport for employment development underscores the importance of operational safety. These regulations are a significant constraint on new and/or replacement habitat creation in the form of green infrastructure for sustainable and Active Travel purposes.

### **Multi-functional Design**

30. All the habitat/landscape spaces need to be multifunctional. RPS, as ecological consultants, have worked in conjunction with landscape team at The Environmental Dimension Partnership Ltd (EDP) and drainage consultants JBA Consulting (JBA) to provide a holistic approach to the design of multifunctional spaces.
31. SuDS functionality has to be incorporated into each of the areas of created habitats. The habitats will also function as 'rain gardens'. They will receive clean surface water during rainfall events which will infiltrate into the ground before being directed into the piped network. Perforated

underdrains will convey flows through the piped network and clean water will ultimately be discharged into Port Talbot Dock.

32. The substrate underlying the created habitats must filter surface water during these events, providing treatment in terms of water quality, and slowing the flow through the ground. A buried membrane will be installed below the pipework in all the habitat areas.
33. Because the surface water drainage system discharges into a tidal waterbody, no surface water will be attenuated on site. The surface water drainage system relates to water quality and conveyancing, and the amount of time that water will be stored in the ground below created habitats will be significantly less than compared to more conventional 'rain garden' features.
34. It is intended that larger rainfall events may bypass the areas of habitat creation via an overflow pipe which would connect directly into the below ground piped system. This would minimise the potential for habitats to become waterlogged soils during extreme weather events during the growing season, promoting positive habitat conditions.
35. The development of the PDZ will permanently modify the current hydrological function to meet all the sustainable drainage requirements for the operational PDZ. Compared to the existing site, no areas of the operational development will be seasonally flooded.
36. The surface water drainage system has been designed for the surface of the created pioneer grassland and coastal grassland to remain primarily dry between mid spring through to early autumn. Higher moisture levels in the substrate are expected during the winter months and are expected to be broadly equivalent to conditions beneath the existing areas of coastal grassland.

## **Stepwise Approach**

### **Avoidance Measures**

37. The site was selected following prolonged commercial discussion and negotiation with ABP as landowner at Port Talbot Dock. The discussions were undertaken in the context of the nomination of Port Talbot Dock as part of the Celtic Freeport regeneration initiative. The freeport aspirations were proposed based on a carefully considered and comprehensive masterplan for the entirety of the Dock.
38. It was evident from the earliest stages that the Project Dragon site was the preferred location for ABP and LanzaTech in the context of the Freeport ambitions. It was also evident that development land is scarce at the Freeport. The site location plan (PDZ and TCA's) for Project Dragon is the only land available for delivery of the development as part of the Celtic Freeport.
39. Following site selection, the potential to avoid sensitive habitats within the application site was considered in the early stages of site layout and design. The patches of the S7 habitat (coastal grassland and dune slack) are only present in the centre of site and retention of the habitat and its condition would not be possible with any potential development layout.
40. The presence of JKW and spread of self-sown willow across the whole of the development site is significant in considering avoidance measures. The presence of JKW means that all other habitats would be lost over time with a significant degradation in biodiversity value. The ecosystem resilience at the site is very low as a result. All the underlying substrate within the PDZ is classified as contaminated due to the vast extent of JKW.
41. There are few locations within the PDZ over 10m from above ground growth, with the network of rhizomes present in the underlying substrate extending beyond the visible stands. There is no

prospect of significant habitat retention and/or enhancement, or any degree of ecosystem resilience at the site if there is no positive intervention such as that proposed as part of the Project Dragon development.

42. The boundaries of PDZ are defined by a main access road (Phoenix Way), the embankment of a railway sidings and existing industrial operations. The extent of the operational industrial processes within the PDZ require the use of the majority of the land within the area of permanent development within the red line application site. Construction activities will require the use of all available space within the PDZ as well as three TCAs for the duration of the construction period. This constraint also prevents the partial retention of habitats within the PDZ.
43. Consequently, there are no viable options for protecting any of the existing habitats. There is an unavoidable need to remove all existing vegetation / habitats during the enabling works. There are an essential first step measure to develop the land currently blighted by JKW.

### **Minimisation of Impacts**

#### ***Oxtongue Broomrape***

44. Oxtongue Broomrape is a legally protected Schedule 8 plant species. It is widely distributed within Port Talbot Docks with colonies present in TCA1 and the adjoining habitat. The location of the Oxtongue Broomrape Protection Area and indicative distribution of the Oxtongue Broomrape as surveyed in 2022 is presented in **Appendix 1**.
45. There is no means of adding more and/or using alternative land in the Celtic Freeport to deliver Project Dragon. LanzaTech has sought to minimise the impact of the development through the design of the temporary construction area at Margam Wharf (TCA1). It has been significantly modified to retain the majority of the Oxtongue Broomrape population in this part of the docks, alongside the host species on which it parasitises (hawkweed oxtongue). An Oxtongue Broomrape Protection Area will be established to help safeguard the rare invertebrate *Phytomyza orobanchia* occurring on the Oxtongue Broomrape in TCA1 and the adjoining land with Margam Wharf.

#### ***TCA East***

46. TCA East has been aligned to existing developed land on the site. A number of buildings (including several that are derelict) will be demolished and the area will be temporarily used for construction in advance of becoming part of the Celtic Freeport. The siting of TCA East has minimised potential effects on adjoining higher value habitats (reedbed and wet woodland) as well as of-site scrub woodland through lighting design.

### **Mitigation Measures**

#### ***Oxtongue Broomrape***

47. The establishment of the temporary Oxtongue Broomrape Protection Area enables opportunities for the implementation of species conservation as mitigation specific to the Project Dragon development.
48. Oxtongue Broomrape is a Schedule 8 plant and a NRW conservation licence will be obtained for disturbance / loss of this plant. The proposed actions to conserve the Oxtongue Broomrape population are summarised in a Technical Note presented in **Appendix 2** and are summarised below.

49. A proportion of the Oxtongue Broomrape colony at Margam Wharf will unavoidably fall within areas that will be required for construction activities. Loss of plants will be mitigated through relocation from the working area into the temporary Oxtongue Broomrape Protection Area. Selected areas of surface substrate containing the plant (seeds and host plant) to be relocated into the prepared receptor areas.
50. In addition, the current habitat conditions in the Oxtongue Broomrape Protection Area will be subject to enhancement. This will comprise the removal of colonising saplings, young self-sown shrubs and the invasive non-native species wall cotoneaster that currently reduce the suitability of parts of the protection area for Oxtongue Broomrape. These actions should increase the size of the population within the Protection Area for the duration of the temporary construction period.

#### ***Open Mosaic Habitat on Previously Developed Land***

51. The measures proposed for the conservation of the Oxtongue Broomrape population will also reduce the extent of loss of open mosaic habitat. The Root Protection Area (RPA) was previously proposed for clearance and development but is now allocated for conservation. Populations of a range of Sites of Importance for Nature Conservation (SINC) indicator species will be retained within the Oxtongue Broomrape Protection Area for the duration of the temporary construction activities. These retained indicator plants also provide a supplementary source of seed available for use in the creation of new pioneer grassland and coastal grassland within the PDZ and the colonisation of biodiversity gabion walls.

#### **On-site Compensation**

##### ***Landscape Strategy Innovation***

52. The nature of the proposed facility imposes significant restrictions on tree and vegetation establishment within the site boundary. This constraint has driven innovation in the landscape strategy for the site which seeks to provide locally appropriate habitat opportunities for a range of species, without the need for significant tree or shrub cover.
53. In the absence of significant tree or shrub planting, above ground habitats have been devised to provide shelter and foraging opportunities for a range of species. To achieve this, 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 and post-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.
54. The habitats to be created in the PDZ have been informed by the habitat losses. They have also been influenced by the location, size and context of the available landscaping areas and the future ground conditions created by their also functioning as 'rain gardens'. Consequently the grassland habitat types being created are associated with dry habitats with tolerance to drought and winter waterlogging. These habitats typically comprise a high proportion of wildflowers and low percentage cover by grasses.
55. A sketch plan of the habitat creation proposals in the PDZ is presented in **Appendix 3**. It illustrates the creation of several small blocks of pioneer flower-rich grassland on post-industrial substrates in the eastern half of the site and the creation of blocks of coastal grassland in the north-western part of the PDZ. Biodiversity gabion walls sited in areas of grassland and a brown roof provide additional habitat features.

56. The localised areas of the existing site subject to seasonal flooding have developed plant species assemblages that are specific to the hydrological conditions. These conditions have been maintained by the high winter water levels which has restricted the rate at which self-sown willow scrub has invaded. Compensation for these habitats within the PDZ is not possible.

#### ***Coastal Grassland Habitat Creation***

57. The proposals will seek to create double the extent of coastal grassland that is being lost.
58. The underlying substrates will comprise materials sourced to mirror the substrate profile beneath the existing coastal grassland. The surface material will be sandy soil ideally sourced from a coastal location.
59. Ideally, the vegetation and surface soils of the existing coastal grassland habitat would be stripped and used as a resource in the creation of the compensatory grassland habitat. However, the presence of JKW rhizome prevents the use of this method in habitat creation.
60. As a direct result of this site-specific constraint, a bespoke coastal grassland seed mix would be sourced containing seed for individual species that are components of this grassland type. In addition, seed from indicator species of coastal grassland will be collected from selected target plant species growing in the Oxtongue Broomrape Protection Area. This additional source of locally native coastal grassland species is a positive for the development.
61. The substrate beneath the coastal grassland will also function as a rain garden for surface water drainage from the site. The depth of underlying membrane will be sufficient to minimise the risk of the surface substrate being waterlogged during the growing season. The depth of freely draining substrates will separate the surface vegetation from potentially wetter ground conditions deeper in the underlying substrate.
62. As an additional precaution, the surface topography will be profiled as a series of shallow 'ridge and furrows'. This approach will create gradation in conditions with maximum attenuation to occur in the furrowed areas while the surface of the ridges would remain predominately dry. A level of soil moisture at depth will be beneficial to plant health and the condition of the coastal grassland habitat.
63. The coastal grassland habitat naturally occurs on sandy free-draining substrates but can be subject to periodic waterlogging, especially in winter. Semi-natural low lying sand dune grasslands occur in habitats with significant seasonal variation in growing conditions and often have a high winter water table. The underlying grounds conditions in coastal grassland areas should provide a supportive environment for this grassland type and the component species.

#### ***Pioneer Grassland Habitat Creation***

64. Pioneer grassland will be established on areas of free draining stony substrate in the eastern half of the site. These ground conditions are broadly equivalent to other post-industrial substrates within the docks that support flower-rich vegetation. Many pioneer grassland species thrive of low nutrient free draining substrates.
65. All the areas of pioneer grassland will also function as rain gardens periodically receiving surface water runoff. This will affect moisture levels in the underlying substrate and will influence the species composition that develops. Many of the plant species associated with post-industrial land grow on dry ground conditions but can tolerate a level of waterlogging in winter. Pioneer grassland will be established through a combination of natural colonisation and the sowing of selected target species sourced from a commercial supplier of native species and/or collected as



seed from plants in the Oxtongue Broomrape Protection Area. The predicted variation in moisture levels should increase species diversity across the habitat areas.

#### ***Biodiversity Gabion Walls and Brown Roofs***

66. Gabion walls designed as biodiversity features (locally appropriate rock, rubble, substrate, bee bricks and bug hotels) are being incorporated into many of the habitat areas. Multiple modules will be used to form linear structures providing 3-dimensional habitats. These habitats will support plant and invertebrate species associated with more sparsely vegetated habitats in post-industrial landscapes.
67. A diversity of fill material and surface substrates will be used in the modules of the biodiversity walls. Small cavity features will be created within the structure for invertebrates. The fill materials will include finer structured materials in layers within the modules to provide the growing medium facilitating colonisation. The variation in the fill material within and between modules will increase the range of features/niches that will be available for the colonisation of plants and invertebrates.
68. Many positive indicator species should establish in the biodiversity walls through natural colonisation from habitats in the wider docks. Seed collected from plants in the Oxtongue Broomrape Protection Area will be used supplement locally native species sourced from commercial suppliers. Seeds will be sown into the fine structured substrate on the upper surface of each module. Plugs of native species will be planted into the soil pockets within the structure. Target plant species include bird's-foot trefoil, kidney vetch, hare's-foot clover, wild carrot, viper's bugloss, pale flax, common restharrow, hop trefoil, wild parsnip, and mouse-eared hawkweed.
69. A few of the biodiversity gabion modules will also be used as experimental receptors for Oxtongue Broomrape and the host species, hawkweed oxtongue. This is an integral element in the conservation strategy for this Schedule 8 plant species.
70. Rock walls/features are also proposed. These will create additional micro-climates for invertebrates and reptiles which may be present in the vicinity and allow for the embankment of substrate to create deeper soil profiles and encourage further diversity in the establishing vegetation. The rock and modular wall features have been located and designed to provide additional visual amenity to the site, as well as biodiversity value.
71. Biodiverse roofs are proposed to a range of new buildings, including the gatehouse, administration block and amenity shelters. Substrate for these roofs will include site-won recycled content where possible and will be seeded/planted with appropriate species to provide habitat opportunities for birds and invertebrates. Log features, recovered from site removals, may also be included where structural strength allows.
72. The gabion walls and green roof features will provide a further habitat area designed to provide benefits for biodiversity in the manner set out above. As agreed with officers at the Council, making use of above ground opportunities alongside the larger areas of grassland creation is an important element of the net biodiversity benefit strategy for the proposal.

#### ***On-site Compensation for Invertebrates***

73. On-site habitat compensation for the invertebrate assemblage within the PDZ comprises the creation of the coastal grassland, pioneer grassland and gabion 'biodiversity' walls. A diversity of features will be provided in the biodiversity gabion walls for invertebrates (through variation in substrate, range of cavity features, floristic diversity). Target invertebrate foodplants are to be

sown and/or planted as plugs grown from seed into the areas of habitat creation. Seed collection from TCA1 will provide a source of target invertebrate foodplants.

74. The shallow ridge and furrow topography being created on the surface of the coastal grassland will create variation in micro-climates and diversify niches for invertebrates.
75. The site is already subject to lighting. The design of the lighting scheme (shown in the submitted Lighting Assessment and Strategy, prepared by AECOM) has been derived to be the lowest possible for operational requirements. Design has sought to minimise Lux levels on the site boundaries to ensure habitats are as dark as possible. Many features will be subject to light spill from essential operational lighting, but back shields and cowls will be adopted as standard for lighting columns adjacent to grassland habitat and the biodiversity walls. The walls, buildings and structures will also shield light in some locations and will create localised 'dark' areas within the operational site to maximise the range of species that colonise the compensatory habitats within the PDZ.

#### ***Implementation and Establishment***

76. Where possible, site-won substrates will be used or alternatively similar inert post-industrial substrates will be sourced from the wider dock or will be imported. These materials will be laid over post development ground levels which will have been cleared of visible elements of invasive species such as JKW which may also have been subject to herbicidal treatment in advance of these works.
77. A weed prevention fabric blanket will be applied across the development site area where necessary, under the supervision of a specialist weed-control contractor, prior to the deposition of the inert substrates to the required depths.
78. With substrates in place, additional landscape and biodiversity elements will be added (such as the biodiverse gabion walls) and specimen plants and plugs added where necessary/appropriate. Greenbiodiverse roofs will be added to completed structures/ buildings in the first planting season post construction.
79. Establishment will be secured through a combination of natural colonisation self-seeding, active control of negative indicator plants through monitoring and management actions, and supplementary seeding of a few target positive indicator species appropriate to the ground conditions.

#### ***On-site Habitat Management and Monitoring***

80. A low intensity management approach would be adopted for the pioneer and coastal grassland habitats that will be establishing on the low nutrient substrates.
81. A biodiversity objective will be set for each habitat type and a programme of monitoring and management actions/schedule will be defined. These will be presented in a Habitat Management Plan for the PDZ covering on-site responsibilities and commitments over a minimum 30-year period.
82. Biodiversity objectives will include targets for habitat condition and floristic diversity in both the pioneer and coastal grassland. Objectives will also include control of weed species that negatively affect the habitat value, with specified remedial actions where any colonise and spread. Given the low nutrient status of the substrate, larger herbaceous species (requiring higher management inputs) are expected to be absent or only present at low abundance.

83. Established grassland areas will be subject to periodic cutting management with the removal of all arisings to control competitive species and maintain diversity. Management for biodiversity (and operational risk management) will include the removal of any colonising shrubs (periodic cutting to ground level) and the control of the perennial weeds (thistles, common nettle and docks).
84. The created grassland habitats and the biodiversity gabion walls and the 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.
85. The status of the created habitats will be documented and reviewed against the biodiversity objectives. Negative trends affecting biodiversity value will be identified through monitoring. The HMP will include formal commitments to implement remedial actions to ensure the biodiversity value assigned during design is achieved in practice.

### **Remedial Measures**

86. A number of potential situations exist which could require remediation in the longer term:
  - The proposed landscape areas remain very sparsely vegetated (i.e. establishment/colonisation is weak), or;
  - Negative indicator species form 10% or more of a habitat area, or;
  - The treatment of any JKW regrowth kills off locally establishing habitats.
87. In these instances, tailored remedial measures would be triggered to ensure the establishment and maintenance of the flower-rich vegetation type defined within the strategy.

### **Off-site Compensation and Enhancement**

88. ABP is promoting proposals for the Future Ports: Port Talbot Programme (FPT), which encompasses the Proposed Scheme. ABP has purchased a landholding at Earlswood, Jersey Marine in July 2023 to provide off-site compensation for future Celtic Freeport developments to secure Net Biodiversity Benefit (NBB).
89. Parts of the ABP owned compensation site will be utilised to provide off-site compensation for residual effects associated with the Project Dragon development. The proposed off-site compensation (habitat creation, enhancement and restoration) to address the residual biodiversity effects of the Project Dragon development and provide an overall enhancement include:
  - Restoration of plantation on ancient woodland to compensate for the loss of low-value self-sown willow scrub.
  - Creation of mixed species scrubby woodland edge and partial replacement of bramble with mixed species scrub to compensate for the loss of mixed species scrub and gorse.
  - Retention of smaller areas of bramble thicket as a component of more structurally diverse woodland edge as compensation for loss of bramble.
  - Enhancement of grassland previously subject to agricultural improvement to restore high value grassland habitats that have degraded or been lost as compensate for the residual effects from the loss of naturally regenerating grassland.

- Restoration of open mosaic habitat through removal of young self-sown birch trees
- Restoration of degraded saltmarsh (alongside Red Jacket Pill) in a habitat that has been heavily damaged by grazing animals, as compensation for the loss of seasonally flooded habitats (dune slack vegetation and common reed).
- The localised areas of dune slack and reedbed that have developed in the PDZ on ground that is subject to prolonged seasonal flooding require specific hydrological conditions. There are no options to create equivalent dune slack or reedbed habitats, subject to prolonged periods of winter flooding, in the off-site compensation site. Consequently, it is proposed that compensation targets poor condition saltmarsh vegetation (an alternative coastal S7 habitat) present alongside the existing man-made intertidal channels.
- Two large scrapes will be created in a low-lying neutral grassland adjacent to saltmarsh habitat. These will be designed to be seasonally wet and should support an assemblage of wetland plants different from the main grassland habitat.

90. A summary of off-site compensation being provided for residual on-site effects is provided in **Table 1.**

91. These off-site measures provide like for like compensation for grassland, scrub and open mosaic habitat. Compensation for the loss of willow scrub is more than offset by restoration of a higher value (irreplaceable) woodland habitat.

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**Table 1: Off-site Compensation Proposals**

| On-site Feature                                          | Remaining effects on Habitats Following On-site Mitigation and Compensation                                                                                                                                                | Off-site Compensation Proposals (Earlswood, Jersey Marine)                                                                                                                                                                                                                                                       | Biodiversity Outcome                                                                                                                                                |
|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Willow scrub woodland                                    | Loss of willow scrub dominated by single species; generally poor in structure and species diversity                                                                                                                        | Restoration of Plantation of Ancient Woodland Site (PAWS) <ul style="list-style-type: none"> <li>- Safeguarding young and old oak trees within the woodland</li> <li>- Phased removal of sycamore and birch</li> <li>- Creation of deadwood habitat</li> <li>- Native tree and shrub species planting</li> </ul> | Full compensation for loss of low conservation value self-sown willow shrubs through of restoration of an irreplaceable habitat currently in unfavourable condition |
| Mixed species scrub and bramble                          | Loss of mixed willow, hawthorn, gorse habitats. Loss of relatively low value bramble monocultures                                                                                                                          | Groups of new shrub planting within the woodland and enhancement of woodland edge habitat                                                                                                                                                                                                                        | Full compensation through restoration of PAWS and native planting to create new mixed species scrub habitat                                                         |
| Naturally regenerated grassland                          | Loss of areas of moderate diversity neutral grassland                                                                                                                                                                      | Enhancement and safeguard of agriculturally affected grassland to neutral grassland                                                                                                                                                                                                                              | Full compensation for loss through enhancement of same broad habitat type and long-term safeguarding                                                                |
| Open Mosaic Habitat and ephemeral vegetation             | Partial loss of pioneer habitats including areas of flower rich vegetation in TCA1.<br><br>Partial offset by creation on-site creation of pioneer grassland and the creation of biodiversity gabion walls and a brown roof | Re-establishment of open mosaic habitat that has been lost through the invasion of self-sown birch                                                                                                                                                                                                               | Full offset of the remaining residual effect following on-site compensation through restoration of an equivalent habitat type                                       |
| Dune slack vegetation and other seasonally flooded areas | Loss of seasonally flooded areas.<br><br>Small area supporting an assemblage of dune slack plant species and three open structured stands of common reed                                                                   | Restoration of livestock damaged saltmarsh in very poor condition alongside Red Jacket Pill. Creation of seasonally waterlogged scrapes in a low-lying agriculturally improved neutral grassland.                                                                                                                | Significant enhancement of a S7 coastal habitat currently in poor condition<br><br>Introduction of wetland features within enhanced neutral grassland               |



### ***Off-site Biodiversity Enhancement***

- 92. There are several large long-established stands of JKW within the off-site compensation site; with stands occurring in semi-natural and secondary woodland, scrub and grassland. An eradication programme for JKW will be implemented in the compensation site as a permanent enhancement for biodiversity.
- 93. The actions taken will prevent further spread and halt the decline in the condition of the habitat in which they occur and prevent spread into adjoining habitats. Alongside the site-specific compensation and enhancement delivered for/by Project Dragon through the measures set out above, areas cleared of invasive plant species would become available for further biodiversity enhancement and compensation for ABP Celtic Freeport developments.

### ***Off-site Habitat Management and Monitoring***

- 94. The habitats within the Jersey Marine compensation site will be subject to a suite of conservation management techniques.
- 95. A Habitat Management Plan will be prepared covering all the off-site compensation habitats and measures required for Project Dragon. In line with PPW, this management plan will be fully implemented over a minimum of 30 years. The mechanism through which the management and monitoring will be delivered and funded over this period will be confirmed in this Habitat Management Plan. The progression of the HMP (and requirement for approval by NPT) will be secured through section 106 Legal Agreement. Each area of habitat enhancement, restoration and creation will be subject to conservation management pursuant to the terms of the section 106 Legal Agreement.
- 96. Biodiversity objectives will be defined for each of the habitats. A long-term programme of monitoring will be defined through which the condition and status of the different habitats will be assessed and documented over time.
- 97. Management approaches in each habitat will be subject to periodic review pursuant to the HMP and the control set out in the s106 Legal Agreement to ensure that the actions remain appropriate for the features and are aligned to optimal biodiversity outcomes.

### ***Delivery and Responsibility***

- 98. The detailed off-site compensation measures will be subject to a Section 106 agreement and bond providing a mechanism through which NPTCBC can ensure that all the defined compensation measures are fully implemented. The section 106 Legal Agreement will also provide mechanisms for NPT to 'step-in' if required.

### **Conclusion and Planning Balance**

- 99. A stepwise approach has been broadly followed during the design of the development which was undertaken prior to the update of Chapter 6 of PPW 11 in October 2023.
- 100. The presence of JKW across the PDZ has meant that the retention of habitats within the development is not possible, irrespective of layout. It has also prevented the relocation of habitats and species as a tool for creating compensatory habitats.
- 101. The operational constraints associated the Sustainable Aviation Fuel production facilities limit the extent and nature of the habitats that can be created.

102. Minimisation and mitigation have been adopted for Oxtongue Broomrape, a plant species legally protected under Schedule 8. A combination of habitat protection and substrate relocation in TCA1 will maintain the majority of the Margam Wharf population.
103. The potential for providing on-site features has been maximised. Higher value habitats associated with previously developed land will be created and new coastal grassland (S7 habitat) will provide 'like for like' compensation. Both these habitats will be designed with free draining substrates and form an integral part of the surface water drainage strategy. Biodiversity gabion walls provide additional bespoke design features within the development.
104. The proposals maximise the potential long-term biodiversity value that can be achieved on-site taking into the account the constraints affecting design.
105. In this context, following the adoption of the on-site compensation, some residual adverse effects on some ecological receptors will be unavoidable.
106. Consequently, a package of off-site compensation measures are proposed and will be essential for the delivery of a net benefit for biodiversity.
107. Where it has not been possible to address a habitat loss on-site, compensation of the same broad habitat type is proposed off-site; targeting higher value (S7) habitat types. Biodiversity objectives will be aligned to establishing and maintaining these in good condition in the long term through conservation management.
108. The targeted control and eradication of JKW will provide biodiversity enhancement preventing further declines in the condition of the semi-natural habitats being adversely affected (long-established broadleaved woodland and scrub habitats).
109. A summary of the measures taken to fully address all the effects of the development is presented in **Appendix 4**.
110. The mitigation, compensation and enhancement will ensure a positive biodiversity outcome in the context of achieving a net benefit for biodiversity (NBB) meeting the requirements of Environment (Wales) Act 2016 and Planning Policy Wales (PPW 11).

#### Contact

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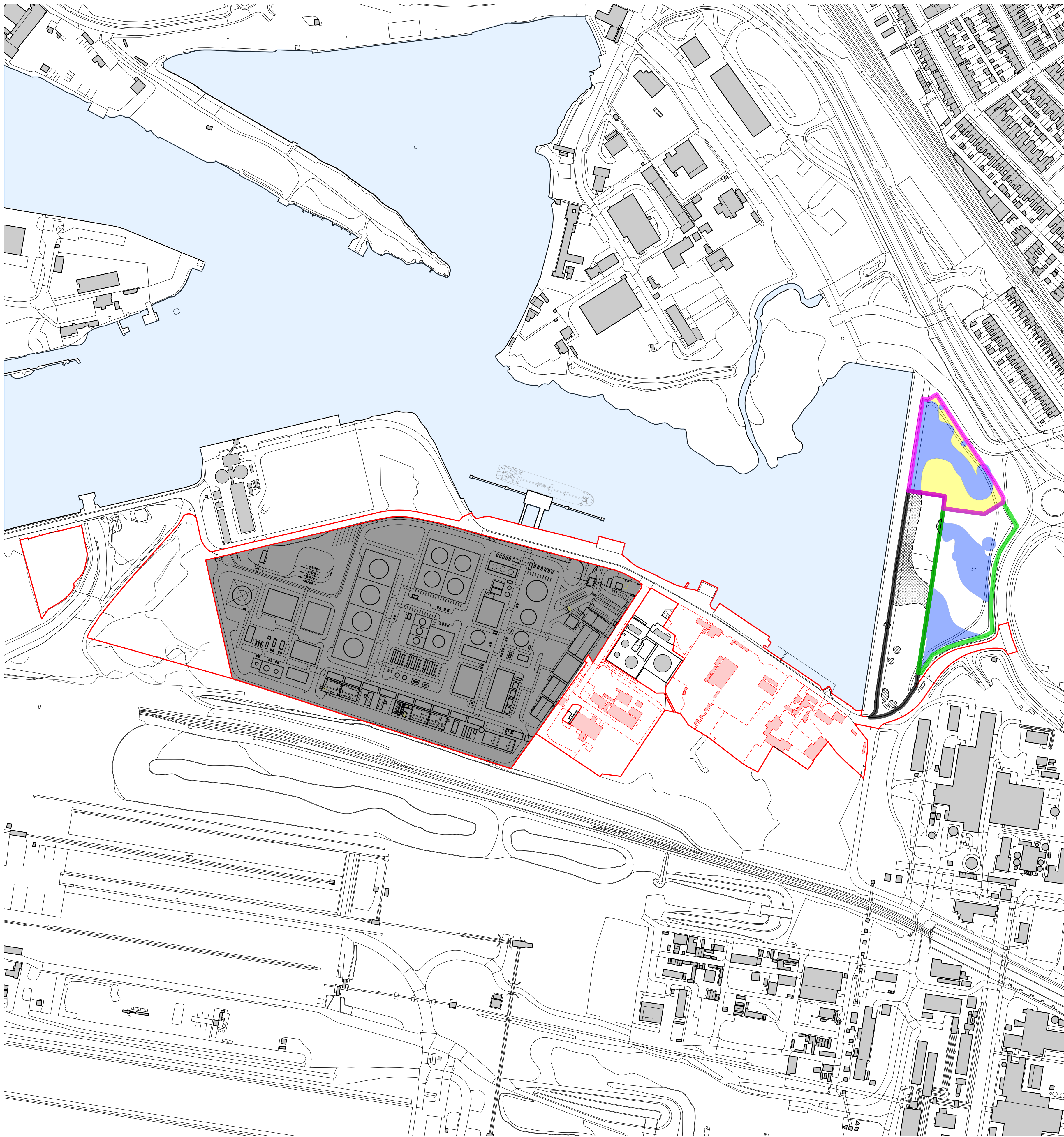
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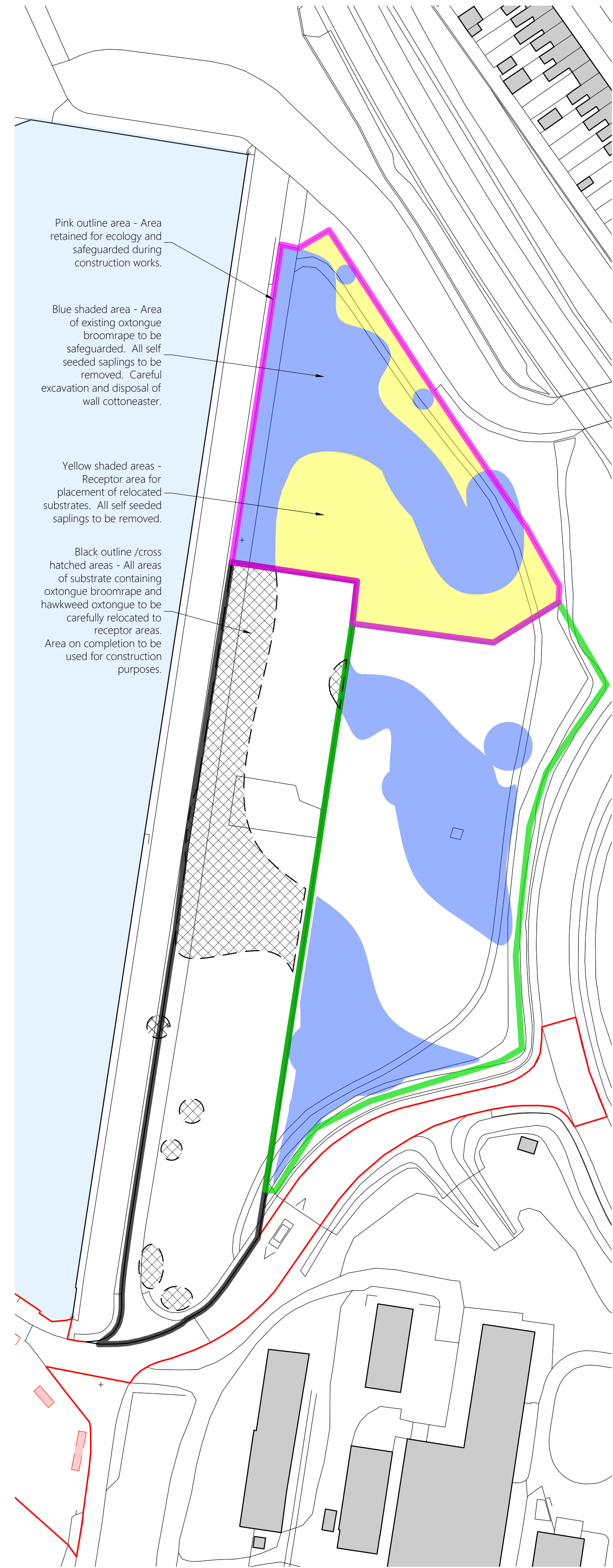
February 2024

## Appendix 1: Oxtongue Broomrape Re-distribution Plan





1 General Site Area - Proposed arrangement  
1:2000 @ A1  
SK30



2 Temporary Construction Area 1 - Proposed Works  
1:1000 @ A1  
SK30

INSPIRE ARCHITECTS  
1 Northumberland Buildings  
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GENERAL NOTES

All works proposed shall be conducted in accordance with the related H&S / CDM regulations. Where doubt arises over any aspect of safety, consult the principal designer.

Should any discrepancy be found on this drawing or related project information then the matter must be brought to the attention of Inspire Architects for resolution as soon as possible.

Do not scale from this drawing unless for planning purposes. All dimensions are in millimetres unless otherwise stated. All information and layouts detailed on this drawing are subject to site dimension checks. This drawing may be based on a measured survey or Ordnance Survey information.

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- Application boundary
- TCA Area: Retained for ecology
- TCA Area: Used for construction purposes
- Adjoining land in the ownership of Tata Steel, shown for context
- Existing, nearby buildings
- PDZ AREA
- Buildings to be demolished
- Existing areas of oxtongue broomrape
- Receptor area for relocated oxtongue broomrape and substrate
- Substrate and planting in this area to be relocated to receptor area.

|          |       |         |          |
|----------|-------|---------|----------|
| P2       | NC    | NC/RT   | 17.01.24 |
| P1       | NC    | NC/RT   | 17.01.24 |
| Revision | Drawn | Checked | Date     |

**INSPIRE**  
Architects

**PROJECT NAME**  
Project Dragon

**CLIENT**  
LanzaTech

**SHEET NAME**  
Oxtongue Broomrape  
Proposed Relocation Option Plan  
(TCA1)

**STATUS**  
Planning

**SHEET SIZE**  
A1

**SCALE**  
As shown

**PROJECT NUMBER**  
2143.01

**DRAWING NUMBER**  
SK31



## Appendix 2: Oxtongue Broomrape Conservation Strategy - Technical Note

### Distribution

1. The assessment of the distribution of Oxtongue Broomrape was undertaken in 2022 for ABP and XLCC during and following the site visit by the national experts Dr Chris Thorogood and Fred Rumsey. Transects were walked with visible flower spikes counted and mapped using a GPS to assess the distribution in different areas of the docks.
2. The Oxtongue Broomrape is a parasitic plant growing on the sole host species, hawkweed oxtongue. The vast majority of the broomrape plants grow on sparsely vegetated ground with a high percentage of bare ground/mosses and a very low percentage cover of grass.
3. Within Margam Wharf the plant was most frequently found in the northern section, located within the Temporary Construction Area and the eastern section outside the application site on land owned by Tata Steel.
4. Notably fewer flower spikes and more scattered smaller colonies were generally found in the southern section of Margam Wharf. The density of spikes varied with localised areas of high flower spike density in the northern and eastern areas. It is estimated that 70% of the Oxtongue Broomrape flower spikes were present in the northern part of TCA1 or on the land owned by Tata Steel in 2022.

### Oxtongue Broomrape Protection Area

5. The northern part of TCA1 will be designated an Oxtongue Broomrape Protection Area for the duration of LanzaTech's temporary construction works, estimated to be 2.5 years. The revision to extent of TCA1 that will be used for construction activities will retain a substantial percentage of the total Oxtongue Broomrape population in Margam Wharf.
6. On the establishment of the Oxtongue Broomrape Protection Area young self-sown shrubs and trees will be removed. Actions to remove wall cotoneaster will also be implemented at the outset of the establishment of TCA1 to improve the condition of the habitats for the Oxtongue Broomrape.

### Species Relocation

7. It is understood that as a Schedule 8 plant, a NRW conservation licence will need to be obtained for the use of part of TCA1 for construction.
8. A proportion of the Oxtongue Broomrape colony at Margam Wharf will unavoidably fall within areas that will be require for construction activities.
9. As compensation, substrate containing the Oxtongue Broomrape and hawkweed oxtongue will be relocated to prepared receptor areas within the Oxtongue Broomrape Protection Area, shown in yellow in Figure 2 (Reference 2143.01 SK31). The establishment of the construction area on top of substrates supporting Oxtongue Broomrape will be mitigated through relocation of selected areas of surface substrate containing the plant (seeds and host plant roots and seeds) to prepared receptor areas where the species is currently absent.

10. All the Oxtongue Broomrape colonies in TCA1 will be remapped in June 2024 in the middle of flowering season. The location of colonies will be marked out on the ground physically indicating the areas of substrate that will be relocated.
11. Lower biodiversity value receptor areas will be identified in the Oxtongue Broomrape Protection Area in June 2024 ensuring they are located outside colonies to be protected.
12. The surface of the areas of selected substrate would be stripped and placed in a shallow layer on the identified receptor areas prior to any other works to establish the construction working area. Heras fencing will be installed around the boundary of the Oxtongue Broomrape Protection Area clearly defining the exclusion area for construction contractors. Heras fencing will also be installed on the boundary between TCA1 and Tata Steel owned land to create a physical barrier between the construction area and off-site colonies.

### **Experimental Translocation**

13. Experimental translocation will be attempted to introduce Oxtongue Broomrape into selected modules of the biodiversity gabion walls.
14. The biodiversity walls in the PDZ will be created towards the end of the construction period. Experimental gabion modules will be established in TCA1 for the duration of the construction period. It is anticipated that different types of fill materials, depths of relocated TCA1 substrate and plant translocation methods will be compared.
15. In general terms, the experimental biodiversity wall modules in TCA1 will be filled with free draining stony substrates mixed with layers of nutrient poor subsoil, with at least the top 50-100mm of the fill material to be substrate from selected areas of TCA1.
16. It is anticipated that individual plants or the roots of hawkweed oxtongue will be lifted from TCA1 and planted in the substrate in the upper section of the module. In addition, seed will be collected from Oxtongue Broomrape plants in TCA1, mixed with a carrier material, and spread on the surface adjacent to the host plant species, hawkweed oxtongue. It will be essential for the host plant to have established prior to introducing seed.
17. Successful gabion wall and translocation specifications would be adopted for selected modules of the permanent biodiversity gabion wall in the PDZ to establish new colonies of Oxtongue Broomrape within the operational site.

### **Management**

18. The establishment of the Oxtongue Broomrape Protection Area will involve the removal of all colonising self-sown shrubs, primarily butterfly bush, willow and birch. In a few locations wall cotoneaster, an invasive non-native plant listed on Schedule 9, has colonised the open mosaic habitat. Where it occurs, it is spreading and adversely affecting the habitat. All wall cotoneaster plants within the Oxtongue Broomrape Protection Area will be removed with the appropriate off-site disposal / incineration of all arisings.
19. Very limited follow up management is envisaged over the 2.5 year construction period following the felling of the shrubs. Any significant shrub regrowth would be cut back in autumn/winter. Any colonising wall cotoneaster plants will be dug out in autumn/winter.



20. Maintenance actions will include the frequent removal of any rubbish from the Oxtongue Broomrape Protection Area.

### **Monitoring**

21. Annual monitoring of the Oxtongue Broomrape Protection Area will be carried out in June. During each monitoring survey the distribution and density of Oxtongue Broomrape flower spikes will be recorded along with distribution of host species, hawkweed oxtongue.
22. Experimental gabion walls will be subject to regular monitoring providing comparisons between the different techniques and materials used. The internal structure of gabion wall structure, presence/absence of host plant, and presence/absence of Oxtongue Broomrape will be recorded. A photographic record will be made during each monitoring visit.

## Appendix 3: Sketch Habitat Creation Plan for the PDZ







**Appendix 4:            Stepwise Approach Summary Table**



Project Dragon: Mitigation / Compensation Headlines

| Feature                                      | Effects                                                                                                                    | Minimisation / mitigation                                                                                                                                                                                                                                                                                                          | On-site Compensation                                                                                                                                                                                                                                                                                                                   | Off-site Compensation (Jersey Marine)                                                                                                                                 | Biodiversity Outcome                                                                                                                                                                                          |
|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Habitats                                     |                                                                                                                            |                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                       |                                                                                                                                                                                                               |
| Natural regeneration - coastal grassland     | Loss of small areas of habitat (0.09ha) supporting assemblage of species associated with coastal grassland                 |                                                                                                                                                                                                                                                                                                                                    | Establish areas of coastal grassland on-site (0.23ha)<br><br>Import materials to replicate the substrate profile below the existing coastal grassland (including sandy subsoil)<br><br>Introduce bespoke seed mix from native seed supplier source and/or seed collected from the TCA1                                                 |                                                                                                                                                                       | Effects fully mitigated within the application site                                                                                                                                                           |
| Dune slack vegetation                        | Loss of seasonally flooded areas supporting an assemblage of plant species associated with dune slack                      |                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                        | Offset residual effect through restoration of alternative S7 coastal habitat type – livestock damaged saltmarsh alongside Red Jacket Pill                             | No options for on-site mitigation or direct off-site compensation due to changes in ground conditions and hydrology<br><br>Restoration of alternative coastal habitat currently in poor condition             |
| Naturally regenerated grassland              | Loss of areas of moderate diversity grassland that has established on previously developed land                            |                                                                                                                                                                                                                                                                                                                                    | Establish small areas of pioneer grassland on free-draining post-industrial substrates through natural colonisation and seeding<br><br>Install grasscrete in lorry parking layby to allow wildflower colonisation.                                                                                                                     | Enhancement and safeguard of agriculturally improved grassland to neutral grassland<br><br>Eradication of JKW on field margins<br><br>Control of bramble encroachment | No options for mitigation or compensation on-site due to minimum extent of the operational infrastructure<br><br>Compensation for loss through enhancement of same broad habitat type and long-term safeguard |
| Open Mosaic Habitat and ephemeral vegetation | Loss of low percentage cover vegetation with diversity of pioneer plant species and areas of flower rich vegetation (TCA1) | Retain part of the OMH in TCA1 (within a defined Oxtongue Broomrape Protection Area) for the duration of the construction period for the project<br><br>Relocation of selected areas of substrate from the temporary construction area into low diversity areas within the construction period Oxtongue Broomrape Protection Area. | Create multiple biodiversity gabion walls with a range of the infill substrate to create varying conditions for pioneer plant species colonisation and invertebrates<br><br>Sow seed collected from target species in TCA1 (or grown on as plugs and planted into the walls)<br><br>Green roof to be created on the reception building | Offset residual effect through restoration/creation/ re-establishment of open mosaic habitat where it has been lost through the invasion of self-sown birch           | Minimisation and mitigation on-site to reduce the magnitude of loss and partially retain this habitat type.<br><br>Remaining residual effect fully offset by off-site habitat restoration                     |

|                                                 |                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                    |                                                                                                                                                                                                       |                                                                                                                                                                                                    |
|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Willow scrub woodland                           | Loss of willow scrub dominated by single species; generally poor in structure and species diversity                                                       |                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                    | Restoration of Plantation of Ancient Woodland Site (PAWS)                                                                                                                                             | The loss of relatively low conservation value self-sown willow shrubs is more than fully offset by the restoration and protection of an irreplaceable habitat in unfavourable condition.           |
| Mixed species scrub and bramble                 | Loss of mixed willow, hawthorn, gorse habitats<br>Loss of relatively low value bramble monocultures                                                       |                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                    | Blocks of new native shrub planting within the woodland and enhancement of woodland edge habitat<br>Eradication of Japanese knotweed from woodland edge and adjoining habitats                        | Full mitigation of losses and provision of additional enhancement for biodiversity.                                                                                                                |
| Seasonally flooded areas                        | Loss of very small area comprising dune slack vegetation<br>Loss of three localised areas of seasonal flooding with open structured stands of common reed |                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                    | Restoration of livestock damaged saltmarsh alongside Red Jacket Pill (S7 habitat)<br>Create seasonally flooded scrapes in agriculturally improved neutral grassland                                   | No options for mitigation or compensation on-site due to change in hydrology<br>Full mitigation of habitat loss through habitat restoration/enhancement                                            |
| Species                                         |                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                    |                                                                                                                                                                                                       |                                                                                                                                                                                                    |
| Oxtongue broomrape<br><i>Orabanche picridis</i> | Partial loss colony at Margam Wharf, part of which lies in TCA1                                                                                           | Establish Oxtongue Broomrape Protection Area to retain the majority of the population in TCA1 during the construction period for the project.<br><br>Relocation of selected areas of substrate into protected habitat<br><br>Removal colonising butterfly bush, willow and birch<br><br>Removal of wall cotoneaster | Experimental establishment of oxtongue broomrape and hawkweed oxtongue on top of selected modules of the biodiversity walls                                        |                                                                                                                                                                                                       | Maintaining the favourable conservation status                                                                                                                                                     |
| Reptiles                                        | Displacement of good populations of common lizard and slow worm<br><br>Small grass snake breeding population                                              | Temporary relocation into receptor habitats within the docks in which habitats have been enhanced                                                                                                                                                                                                                   |                                                                                                                                                                    | Establishment of a permanent receptor habitat with capacity to support the relocated population and allow for a future increase in the size of populations across the Jersey Marine compensation site | Maintaining the favourable conservation status                                                                                                                                                     |
| Bats (Roosting)                                 | Loss of low status common pipistrelle roost                                                                                                               | Lighting design                                                                                                                                                                                                                                                                                                     | Provision of bat boxes on larger shrubs / trees in darker locations<br><br>Demolition under NRW licence<br><br>Possible survey updates prior to survey application |                                                                                                                                                                                                       | Legislation compliance<br><br>Maintaining the favourable conservation status                                                                                                                       |
| Bats (Foraging)                                 | Loss of foraging areas and flight lines for a small range of bat species – primarily common pipistrelle<br><br>Consistent low levels of activity          | Lighting design<br><br>Minimising effects outside the application site                                                                                                                                                                                                                                              |                                                                                                                                                                    | Maintain flightlines and foraging habitat around boundaries of development and temporary working areas                                                                                                | No options for on-site habitat provision and minimisation of effects on adjoining land.<br><br>Residual effects offset through off-site enhancements increasing opportunities for foraging habitat |

|                     |                                                                                                                           |                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                               |                                                                                                                                      |                                                                                                                                                                                                 |
|---------------------|---------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Breeding birds      | Displacement of an assemblage of breeding species associated with the scrub habitats. Cetti's warbler present in locality | Lighting design<br>Minimising effects outside the application site                                                                                                                                                   | Provision of bird boxes on larger shrubs / trees in unlit locations outside the PDZ                                                                                                                                                                                                                           | Enhancements for breeding birds – foraging habitat, nesting habitat                                                                  | No options for mitigation or compensation on-site. Residual effects offset through off-site habitat enhancement                                                                                 |
| Overwintering birds | Scrub habitats used by wintering bird assemblage                                                                          |                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                               | Habitat enhancements to include provision of food resources for overwintering passerines                                             | Residual effects offset through off-site habitat enhancement                                                                                                                                    |
|                     | The large open water dock is used gull species and wetland bird species.                                                  | Minimising effects in the section of open water dock adjoining the application site<br>Lighting design at dockside                                                                                                   |                                                                                                                                                                                                                                                                                                               |                                                                                                                                      | Unavoidable adverse residual effect – not significant.                                                                                                                                          |
| Otter               | Potential use of open water dock and adjoining scrub                                                                      | Sensitive working methods and species protection precautions<br>Lighting design at dockside                                                                                                                          |                                                                                                                                                                                                                                                                                                               |                                                                                                                                      | Legal compliance<br>Avoidance of adverse effects on the local population                                                                                                                        |
| Invertebrates       | Displacement of species assemblages associated with OMH, naturally regenerating grassland and seasonally flooded areas    | Protection of part of the OMH habitat in Margam Wharf through establishment of Oxtongue Broomrape Protection Area for the duration of the construction period.<br>Lighting design around gabion 'biodiversity' walls | Establishment of coastal and pioneer grassland habitat<br>Provision features beneficial for invertebrates in biodiversity walls – a diversity of features for invertebrates will be provided through variation in substrate, the range of cavity features, floristic diversity)<br>Provision of insect hotels | Invertebrate habitat creation to enhance species diversity and the resilience of populations<br>Potential to target specific species | Localised opportunities for on-site mitigation or compensation<br>Residual effects offset by off-site habitat enhancements of ancient woodland, scrub habitat, neutral grassland, and saltmarsh |