

Ecological Impact Assessment



Project: Land at Dragon Parc, Merthyr Tydfil

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Contents

1. Introduction

- 1.1 Site Description
- 1.2 Surveyor Experience

2. Legislation

- 2.1 Habitats
- 2.2 Species

3. Additional Survey Work

- 3.1 Ground Based Visual Inspection of Trees

4. Impact Assessment

- 4.1 Ecological Feature - River Taff
- 4.2 Ecological Feature - Otter
- 4.3 Ecological Feature - Bats
- 4.4 Ecological Feature - Nesting Birds
- 4.5 Ecological Feature - Pond
- 4.6 Ecological Feature - Great Crested Newt
- 4.7 Ecological Feature - Reptiles

5. Enhancement Measures

- 5.1 Management of Japanese Knotweed
- 5.2 Drainage Swale
- 5.3 Otter Holt Creation
- 5.4 Bat and Bird Box Provision

6. Management Responsibilities

Appendix

Proposed Development Site Boundary

Phase 1 Map

Photographs of Vegetation to be Lost

Pond and Swale Profile

Bat, Bird and Otter Boxes

2. Introduction

The applicant is seeking permission to undertake a suite of work within the proposed site boundary to remove the site from its current flood zone rating. The proposed works within the site boundary will include the opening up of a culverted section of watercourse, which currently runs underneath the site, to create a drainage swale. A new discharge point for the swale into the River Taff will be created to the south east of the site. The drainage swale will run into a small section of box culvert before entering the new discharge point. The land to the south of the site is much lower than the rest of the wider development site. A new access road from the current highway, over the lower section of land, to the plateau within the wider site will be created. **Whilst the phase 1 survey covers the land within the wider site, this document refers only to work being completed within the red line boundary shown in Appendix 1. There will be no works completed to any habitat outside of the red line boundary.**

The site is centred at SO 05436 04336 and has previously been used as factory. The majority of the site is a large expanse of hardstanding with building rubble piled at varying levels across it. A tarmac access road runs around the periphery of the site. A mature tree line forms the western boundary with a small overgrown pond shaded out by trees and undergrowth in the same area. An area of marshy grassland is also present to the north of the site with a small expanse of scrub woodland in the area as well.

In order to undertake a full appraisal of the proposed development and the potential impacts and significance of impacts upon the habitats and species within the development site and adjacent habitats, an Ecological Impact Assessment (EclA) has been undertaken. An EclA helps provide a clear and methodical way to identify, quantify and evaluate the potential significant effects of a proposed plan or project. This EclA builds upon the initial phase 1 survey report completed by Ecological Services in 2019. The phase 1 report makes a number of recommendations for a larger parcel of land and was written at a time when the detailed development boundary was not known. The phase 1 report by Ecological Services provides information on the habitats within the proposed development site and wider boundary. The document will provide baseline information for any future development works in the wider area.

1.1 Site Description

The proposed development site was formerly the site of a Hoover Factory within Merthyr Tydfil. The site has been cleared of the majority of the buildings leaving behind foundations and rubble piles across the site. One building is still remaining to the south east of the site. The River Taff runs directly along the eastern boundary of the proposed development site.

The site lies within the settlement of Abercainaid to the south of Merthyr Tydfil directly adjacent to the River Taff. The site is immediately surrounded by light industrial units to the north and west with residential housing present to the south of the site. A small area of woodland and the Taff Cycle Trail lie to the south west of the site.

A Preliminary Ecological Assessment (PEA) was completed by Ecological Services Ltd on the 13th August 2019. An additional site visit was undertaken on the 21st May 2020 to inspect the trees proposed for removal as part of the works. Full details of the survey work and findings of the PEA and bat activity surveys can be found in the PEA report dated 16th October 2020 by Ecological Services Ltd. Section 3 of this document details the survey work completed in 2020. A habitat map of the site based upon the PEA is provided in Appendix 2.

1.2 Surveyor Experience

Aislinn Harris is a full member of Chartered Institute of Ecology and Environmental Management (CIEEM). Aislinn is an ecologist with 12 years experience undertaking a wide range of flora and fauna surveys. All survey work is undertaken following JNCC Phase 1 Survey Guidelines and CIEEM Guidelines for Preliminary Ecological Appraisal (2nd Ed 2017). Aislinn is a licenced bat ecologist (S085699-1) with a wide variety of experience undertaking bat activity surveys..

2. Legislation

The **Habitats Directive (Directive 92/43/EEC)** aims to '*contribute towards ensuring biodiversity through the conservation of natural habitats and of wild fauna and flora in the European territory of the Member States*'. The Directive requires the establishment and conservation of a network of sites within each member state which protect the rarest flora and fauna found across Europe. A number of species and habitats are listed in Annex 2 of the directive for which areas can be designated as a SAC. The aims of the Habitats Directive are transposed into British Law through the **Conservation of Habitats and Species Regulations 2017**.

The **Wildlife and Countryside Act (1981)** as amended provide the legislation framework and protection for SSSI. A SSSI is designated by a statutory nature conservation body such as Natural Resources Wales (NRW) for its make up of flora, fauna, geological and / or physiographical features. Each SSSI should have a citation which describes the site and its special features.

The Environment (Wales) Act 2016 is a wide reaching piece of legislation which seeks help improve the management of Wales' natural resources into the future. The Act sets out a Wales wide approach to planning and managing its natural resources at a national and local level in a sustainable manner. One main requirement for all public bodies, such as local councils, is to maintain and enhance biodiversity where possible within their duties.

2.1 Habitats

Statutory Designations

No statutory protected sites lie within or directly adjacent to the proposed development site. A single statutory protected site is within the search area returned by the data search. The Cwm Glo A Glyndyrys Site of Special Scientific Interest (SSSI) is located approximately 1km from the proposed development site.

Invasive Plant Species

Japanese knotweed is listed under Schedule 9 of the Wildlife and Countryside Act (1981) which makes it an offence to plant or allow to grow in the wild. Under the Environmental Protection Act 1990, Japanese Knotweed is classified as controlled waste.

Non Statutory Designations

The proposed development site lies adjacent to the River Taff Site of Importance for Nature Conservation (SINC). The creation of the new outfall from the swale into the River will require engineering work that affects the banks of the River Taff.

A pond is present to the west of the site which qualifies as section 7 habitat under the Environment (Wales) Act 2016 and a UK Biodiversity Action Plan habitat. Any loss of such habitat, regardless of the quality, will require compensation measures.

2.2 Species

Great Crested Newt

Great crested newts (*Triturus cristatus*) are a European protected species and are protected under the Conservation of Habitats and Species Regulation 2017. In summary, they are protected from:

- Deliberate capture, killing and injuring,
- Deliberate disturbance of a breeding site or resting place,
- Deliberate taking or destroying of eggs,
- Damage or destruction of a breeding site or resting place.

Great Crested Newts are listed on schedule 5 of The Wildlife & Countryside Act 1981 which protects them from intentional or reckless disturbance or obstruction when using a structure or place for shelter and / or protection. It is also an offence to sell, offer or expose for sale a great crested newt.

Bats

All British bats are a European protected species and are protected under the Conservation of Habitats and Species Regulation 2017. In summary, they are protected from:

- Deliberate capture, killing and injuring,
- Deliberate disturbance of a breeding site or resting place,
- Damage or destruction of a breeding site or resting place.

Schedule 5 of The Wildlife and Countryside Act (1981) also protects all species of British bat and their roosting locations. British bats are protected from intentional or reckless disturbance and or obstruction of their roosting places. Barbastelle, bechstein, noctule, brown long eared, common pipistrelle, soprano pipistrelle, greater horseshoe and lesser horseshoe bats are also listed in section 7 of the Environment (Wales) Act 2016 which makes them a key species to sustain and improve biodiversity

Otter

The common otter (*Lutra lutra*) is a European protected species and is protected under the Conservation of Habitats and Species Regulations 2017. In summary, they are protected from:

- Deliberate capture, killing and injuring,
- Deliberate disturbance of a breeding site or resting place,
- Damage or destruction of a breeding site or resting place.

Otter are listed on schedule 5 of The Wildlife & Countryside Act 1981 which protects them from intentional or reckless disturbance or obstruction when using a structure or place for shelter and / or protection. It is also an offence to sell, offer or expose for sale an otter.

Otter is listed in section 7 of the Environment (Wales) Act 2016 which makes them a key species to sustain and improve biodiversity.

Nesting Birds

All breeding birds are protected under schedule 1 of the Wildlife and Countryside Act (1981) as amended. Under this Act it is an offence to:

- Intentionally take, damage or destroy the nest of any wild bird while it is in use or being built.
- Intentionally take or destroy the egg of any wild bird

Enhanced protection is afforded to species listed on Schedule 1 of the Act, this additional protection makes it an offence to:

- Intentionally or recklessly disturb any wild bird listed on Schedule 1 while it is nest building, or at a nest containing eggs or young, or disturb the dependent young of such a bird.

Reptiles

Reptile such as the slow worm, common lizard, adder and grass snake are protected under the Wildlife and Countryside Act 1981(as amended). They are protected from killing, injuring and sale. In Wales sand lizard, smooth snake, adder, grass snake, slow worm and common lizard are listed in section 7 of the Environment (Wales) Act 2016 which makes them a key species to sustain and improve biodiversity.

3. Additional Survey Work

As the development proposals have progressed the potential impacts of the development work to create the new swale and discharge point are more fully understood. An application was made to the Local Planning Authority (LPA) for pre planning application advice as well. Comments were received from the LPA ecologist which included a request for more detailed assessments of habitat to be lost as part of the works. A further site visit was completed on the 21st May 2020.

3.1 Ground Based Visual Inspection of Trees

A tree survey of the trees within the proposed development site has been completed by ArbTS. Appendix 4 of the Arboricultural Report dated 12th July 2020 shows the proposed extent of tree loss across the site. A site visit was completed on the 21st May 2020 to undertake a ground based visual assessment of all trees that will be lost as part of the development for the potential presence of bats.

Whilst it is a suboptimal time of year to complete visual inspections of trees for bat roosting potential, a good view around each tree was possible. Each tree or group of trees is noted in the below table and photos are provided within Appendix 3. The references used correlate to the tree survey report. Given the number of trees and lack of roosting features observed each tree with the relevant group is not individually noted.

Tree	Potential Roost Features	Potential for Bat Use
12m of tree line along bank of River Taff	None observed. All observed trees were young with no gaps or cracks noted	Negligible
Group of trees around pond to the west of site - forms part of G2 as detailed in tree report	None observed. All observed trees were young with no gaps or cracks noted	Negligible
T254 Silver Birch	None observed. No broken limbs or gaps or cracks within tree.	Negligible
Group of trees by current access gates into the site - forms part of G4 as detailed in tree report	None observed. All observed trees were young with no gaps or cracks noted	Negligible

4. Impact Assessment

The PEA report details all the habitat types and species within the proposed development site and zone of influence around the site which may be impacted by the development proposals. However, the role of a EclA is to address significant effects which the project may have. For the purpose of this assessment significant impacts will be those that affect legally protected sites and species within and directly adjacent to the proposed development site.

The EclA process presents a hierarchy of approaches to ensure a project of plan lowers its potential impacts. The works should seek to

- **AVOID** - Consider options to avoid any potential harm to an ecological feature,
- **MITIGATE** - If negative effects are unavoidable, measures should be implemented to minimise and reduce potential effects,
- **COMPENSATE** - If negative effects are still likely to be experienced despite measures to reduce impacts being implemented appropriate compensatory measures should implemented.
- **ENHANCEMENT** - Works should always seek to provide net benefits for biodiversity to help meet the section 7 requirements of the Environment Act (Wales) 2016.

The scope of the proposed development works has been reviewed and streamlined to ensure only works necessary to improve the drainage of the site are to be undertaken. A reduced area of impact is shown in Appendix 1. The development proposals are to open up a current culverted watercourse and create an open swale along the west and southern boundary of the site. A new discharge point for the swale will be created at the very south eastern corner of the site. The new discharge point will be 12m of stepped block stone work along the bank of the River Taff built to match the existing bank profile. A new access road from the roundabout and public highway to the south east to the main plateau in the centre of the site will also be created.

When the Preliminary Ecological Appraisal was completed in 2019 when the detailed sale of the development works was not known The report details a wide variety of potential impacts, mitigation and compensation proposals. The development proposals have now progressed and the potential impacts of the work are now known.

The development proposals have the potential to negatively impact on:

- The River Taff SINC
- A single pond, S7 Habitat type
- Otters

- Bats
- Great Crested Newts
- Nesting Birds

4.1) Ecological Feature - River Taff

The River Taff flows directly adjacent to the proposed development site. 12m of river bank will be disturbed by the proposed development works to create a new discharge point for the drainage swale into the river. To create the new discharge point engineering work along the river bank will be required. The river bank is currently steep sloping and approximately 4m in height. It is covered in a mixture of bramble scrub, young trees and patches of Japanese knotweed.

Potential Impacts

- Pollution incident during engineering work
- Material falling into river during vegetation clearance
- Long term discharge from new swale into the river
- Habitat loss along the river bank

Measures to be Implemented

- A toolbox talk will be provided to all site contractors for work to create the new drainage point / outfall. The toolbox talk will explain the protection afforded to the River Taff and potential negative impacts the work could have. Workers will be asked to remain vigilant for potential impacts their work could have and ways in which to avoid or reduce such impacts.
- Only 12m of vegetation will be cleared along the river bank to facilitate the creation of the new outfall. The vegetation to remain along the river bank will be securely marked out and defined and no clearance or entrance into these areas will be permitted.
- A Construction Environmental Management Plan will be completed and agreed with all site contractors. The management plan will set out a strict set of measures to ensure pollution does not enter the river during construction works. Measures to be addressed will include, but not be limited to, safe storage of materials and machinery at least 10m away from the river and ensuring soil particles from excavation don't blow into the river.
- All cuttings created through clearance of vegetation along the river bank will be collected and removed from the river bank the day they are cut. The cuttings and

brush will be removed to prevent materials entering the river and negatively affecting water quality. Cuttings will be disposed of by an appropriately licenced waste disposal company as they will likely be contaminated with Japanese knotweed

- The loss of 12m of vegetation along the western bank of the River Taff is unavoidable. However the vegetation cover along the eastern bank will remain untouched and continue to provide a dark vegetated bank for mammal movement along the river. Replacement tree planting along the river bank in the area where vegetation is being lost will be completed to provide some vegetation cover.

4.2) **Ecological Feature - Otters**

Otters are known to move along the River Taff and are a European protected species. The PEA report details that it is unlikely that an otter holt or resting site are currently present within or adjacent to the proposed development site. Given the dense vegetation cover and steep gradient along the river bank which will be impacted on by development works, it was not possible to fully inspect all areas. However a visual inspection from the bank top through gaps in the vegetation was completed where possible. The presence of otter moving up and down the river is assumed.

Potential Impacts

- Temporary noise and lighting from construction works restricting movement along river,
- Otter to become trapped in excavations or machinery used to create the swale and new discharge point,
- External lighting during construction illuminating the river and restricting movement along it,
- Loss of 12m of vegetation along the western bank of the River Taff restricting movement along river,,

Measures to be Implemented

- A toolbox talk will be provided to all site contractors for work to create the new drainage point / outfall. The toolbox talk will explain the protection afforded to the otters and potential negative impacts the work could have. Workers will be asked to remain vigilant for potential impacts and ways in which to avoid or reduce such impacts.
- If at any point otter or evidence of the presence of otter is found during work, all work will cease and the supervising ecologist contacted for advice if they are not

present on site. Advice may include that all work stop until a development licence from NRW is sought. The presence of a holt or lying up site within the 12m of vegetation to be cleared is thought to be very low.

- An ecologist will supervise the vegetation removal along the river bank to ensure otters are not disturbed and that no resting places or holt locations are present. The vegetation will be removed in two staged working from the top of the bank down to the the river edge. The vegetation will be cut to 0.5m high in the first stage and then to ground level in the second stage.
- No work to be undertaken within 30m of any otter shelter or 200m of any breeding holt, except under licence from NRW.
- No works resulting in large-scale noise or vibration (e.g., pile driving or blasting) within 100m of any otter shelter, unless under licence from NRW.
- Any open pipes (culverts) installed stored on site will be closed to prevent animals entering and becoming trapped.
- All rubbish/materials will be collected and removed from site on a regular basis to prevent trapping and/or injury of wildlife.
- All otter shelters will have a 30m 'out-of-bounds' protection zone (clearly demarcated). Vegetation will not be cleared from these areas without consultation and an appropriate licence from NRW.
- In the unlikely event of an otter being injured or killed (or shelters damaged), the ECoW will be contacted immediately for advice
- No night time working will be undertaken as part of the development proposals.
- No lighting will be erected as part of the development proposals at any location within the site.
- All site machinery and materials will be kept securely in a fenced site compound. The fencing will be designed and used to prevent otter gaining access into the machinery or stored materials. Construction compounds will be placed at least 10m away from the River Taff.
- Any excavations that have a depth in excess of 0.5m and that are left open over night will have a means of escape left for any mammals that may fall into them. A wooden board or equivalent will be left from the bottom to the top of the hole set at

a 30° angle. This will allow and mammal to escape and avoid increased stress from being trapped.

- The loss of 12m of vegetation along the western bank of the River Taff is unavoidable. However the vegetation cover along the eastern bank will remain untouched and continue to provide a dark vegetated bank for mammal movement along the river. Replacement tree planting along the river bank in the area where vegetation is being lost will be completed to provide some vegetation cover.
- The design of the new outfall is shown on drawing BMQ-JBAU-XX-XX-DR-C-0020-S3-P02-Outfall by JBA Consulting. The drawing shows the cascade format of the new outfall that is stepped back into the bank. Otter will be able to move along the new outfall section and follow the course of the river.

4.3) Ecological Feature - Bats

No evidence of the presence of roosting bats has been found within the proposed site boundary. Whilst the presence of roosting bats within the site is thought unlikely, commuting and foraging bats along the River Taff is thought extremely likely. Bats are also likely to forage across the site and the tree line to the west of the site. The presence of a wide variety of bats moving along the river corridor at night must be assumed.

Potential Impacts

- Disturbance of commuting and foraging bats.
- Temporary noise and lighting from construction works restricting movement along river.

Measures to be Implemented

- All site contractors will be given a toolbox talk which covers the legal protection given to bats, what they look like, where they may be found and what to do if bats are found at any point during the works on site. Should bats be found, a suitably experienced ecologist will be contacted for advice which may include that work to that area stop and a licence is sought from NRW.
- No night time working will be undertaken as part of the development proposals.
- No lighting will be erected as part of the development proposals at any location within the site.
- The loss of 12m of vegetation along the western bank of the River Taff is unavoidable. However the vegetation cover along the eastern bank will remain untouched and continue to provide a dark vegetated bank for mammal movement

along the river. Replacement tree planting along the river bank in the area where vegetation is being lost will be completed to provide some vegetation cover.

4.4) Ecological Feature - Nesting Birds

Nesting birds have the potential to use the trees and scrub within the proposed boundary. Vegetation removal is proposed along the river bank of the River Taff and in localised areas along the tree line to the west of the site. All wild birds are protected while nesting with some exceptions for certain pest species.

Potential Impacts

- Disturbance of the nesting birds.
- Loss of bird nesting habitat.

Measures to be Implemented

- Any tree or scrub removal within the site boundary will be completed outside of the bird nesting season of March to August inclusive. If this is not achievable an ecologist must inspect any trees or ground vegetation with the potential for birds to be present, for active birds' nests prior to removal works beginning. If an active nest or activity indicating a nest might be present is identified a buffer zone of 5m around the nest must be observed until the chicks have fledged. Only then can the vegetation be removed.

4.5) Ecological Feature - Pond

A small pond is present to the east of the site, approximate location shown on the habitat map in Appendix 4. The pond and surrounding trees need to be removed to create the new swale route. The pond is currently heavily silted up and covered by trees. It was thought to have been created as part of the landscaping of the site during its former use as a factory site. Ponds are a section 7 habitat and are protected from loss under the Environment (Wales) Act 2016. Where unavoidable any loss of such habitat must be replaced within the site boundary.

Potential Impacts

- Loss of habitat,
- Disturbance of aquatic species using the pond,

Measures to be Implemented

- All contractors will be given a tool box talk that includes the protection afforded to ponds and the working methodology to be implemented around the pond.
- The location of the pond will be marked out under supervision of the ecologist prior to any clearance work in this area starting. The trees surrounding the pond will be cut down in two stages. The trees will be cut down to 0.5m high in the first stage with all cuttings removed to an agreed storage location on the hardstanding. The pond will remain undisturbed as far as possible during the first stage of clearance.
- The second stage of clearance will be undertaken once all trees around the pond have been cut down to 0.5m high. Ecological supervision of this stage of clearance will be undertaken.
- Under ecological supervision, a channel will be cut in the southern end of the pond to allow water to drain out of the pond naturally. The tree roots around the pond will be grubbed out using a toothed bucket of a JCB. The removal of tree roots will start at the northern area of the section proposed for removal and progress south wards. All tree roots will be removed and stored in an agreed area (on the hardstanding) until they can be disposed of. The toothed bucket will be used to pull out any vegetation within the pond, which will then be left along the retained tree line for 24hrs. This will allow any animals within the silt to naturally relocate into the retained vegetation.
- A new pond will be created along the western edge of the new swale, location shown on drawing BMQ-JBAU-XX-XX-DR-C-001 rev P04 dated 17/10/19 by JBA Consulting. The pond will measure 10m by 15m and be a maximum depth of 1m. A varied profile of the pond will be created to encourage a diversity of insects, animals and plants to use the feature. The proposed profile for the pond is shown in Appendix 4.
- The pond will be made watertight and subject to suitable aquatic planting. A planting scheme which includes suitable native species, measures to ensure establishment, aftercare and management will be provided and agreed with the Local Planning Authority.

4.6) Ecological Feature - Great Crested Newt

The pond present within the site boundary is thought to be unsuitable for the potential presence of great crested newts. The closest record for Great Crested Newt (GCN) is approximately 1.1km away from the proposed development site. A Habitat Suitability Index (HSI) assessment was completed by RPS in 2016 which found the pond to have poor suitability for use by GCN. The potential presence for GCN within the pond cannot be completely ruled out.

Potential Impacts

- Loss of habitat within pond,
- Disturbance or destruction of a resting place,

Measures to be Implemented

- All contractors will be given a tool box talk that includes the protection afforded to GCN and the potential for their presence within the pond on site and mature vegetation. The toolbox talk will include what to do if GCN are found on site.
- All works to the pond will be supervised by an appropriately licenced GCN ecologist. If at any point during works on site GCN are found, work will cease and the supervising ecologist will be contacted for advice on how to proceed. This advice could include that a development licence from Natural Resources Wales (NRW) will be sought prior to works recommencing on site.
- A new larger pond will be created within the proposed development site. The current pond is heavily silted over and shaded out by overhanging trees. The new pond will have clearer water and be larger in area creating improved habitat for any amphibian species in the area.

4.7) Ecological Feature - Reptiles

The mosaic of habitats across the proposed development site are considered to be suitable for summer and winter use by common reptile species. The vast majority of habitats suitable for use by reptiles will not be affected by the proposed new swale creation. However 12m of woodland / scrubby habitat will be lost along the western river bank of the River Taff and a small group of trees around the current pond will be removed as part of the proposed works. Any animals displaced during the works will be allowed to natural relocate themselves to adjacent suitable habitat.

Potential Impacts

- Loss of habitat used for hibernation purposes,
- Potential to kill and or injure reptiles without sensitive timing of work,
- Loss of commuting habitat along river banks,

Measures to be Implemented

- All contractors will be given a tool box talk that includes the protection afforded to reptiles and the potential for their presence within the tree roots and rubble piles on site and mature vegetation. The toolbox talk will include what to do if reptiles are encountered during works.

- Vegetation and rubble removal will be undertaken outside of the core hibernation season for reptiles which is October to March inclusive. Vegetation removal will be completed during September to ensure no conflicts with bird nesting season.
- An ecologist will supervise the vegetation removal along the river bank and around the pond to ensure reptiles are not disturbed or injured during works. The vegetation will be removed in two stages. The vegetation will be cut to 0.5m high in the first stage and then to ground level in the second stage.
- All brash, cuttings and roots will be removed from the work area to make them unsuitable for use by reptiles. The brash, cuttings and roots will either be removed from site or stored on the hardstanding areas.
- The disturbance created by the first stage of vegetation removal will encourage reptiles to naturally relocate to adjacent habitat and avoid machinery

5. Enhancement Measures

The proposed development works are focused on the route of a new drainage swale and outfall point into the River Taff and a new access road across the lower part of the development site. The Environment Act (Wales) 2016 places a duty on all competent authorities to ensure that biodiversity is not only conserved but enhanced. The proposed development works create potential features that can be improved for the benefit of biodiversity.

5.1 Management of Japanese Knotweed

Japanese knotweed is present to the south of the proposed site boundary where the new access road into the development site is proposed. Japanese knotweed is also present along the river banks of the River Taff in the area where the new outfall is proposed. The approximate location of the knotweed is shown in Appendix 2.

In order to prevent the spread of the knotweed and improve the biodiversity of the development site and banks of the River Taff a Japanese knotweed management plan is required. A Japanese Knotweed Management Plan has been completed by JBA Consulting. The Japanese Knotweed Management Plan will include:

- Details on management of Japanese knotweed during construction work to prevent spreading the plant across the site or contamination of off site areas.
- Details on the correct disposal of any waste material to be taken off site that may contain Japanese knotweed.
- Details of the treatment of Japanese knotweed within the site boundary to reduce the cover and spread of the plant. This will allow natural flora to establish and improve the diversity of the site.

5.2 Drainage Swale

The newly created drainage swale will measure at least 550m in length, 500m of this will be open sided swale. The bottom section of the swale will be culverted underneath the new access road with man made materials used to for the bottom and sides. The 500m open sided swale will have soil and vegetation along the bottom and sides of the feature. These could be planted and managed to improve the biodiversity of the swale for wildlife.

The swale will be:

- Created with the profile shown in Appendix 4. The varied profile of shorter and deeper water depths will create niche areas suitable for a variety of plants, insects and animals.
- The banks of the swale will not be more 45 degrees in profile to allow small mammals access up and down the channel.
- The newly created swale will be seeded with a wetland meadow mixture such as EM8 - Meadow Mixture for Wetland from Emorsgate Seeds. The seed mix will be sown when the swale profile is completed. The seeded areas will require management to ensure weeds do not establish and out compete the species within the seed mix. During year 1 from the time of sowing seed, the vegetation along the swale will be cut every 2 months.

- After year 1, the vegetation within the swale will be cut once per year using a strimmer where required to prevent bramble encroachment. Vegetation will be cut no lower than 150mm in height. Each bank will be cut in its entirety in alternate years. All cuttings will be collected and removed from the ditch banks

5.3 Otter Holt Creation

An artificial otter holt will be provided as part of the development proposals to enhance the area for otter. A recycled plastic otter holt of the design (or similar depending on stock availability) will be purchased. A photograph of the holt design is shown in Appendix 5. The dimensions of the holt are:

- 830mm wide
- 1200mm long
- 380mm high

The holt will be provided in the river bank directly adjacent to the new outfall. The exact area and installation of the holt will be directly supervised and agreed with the supervision ecologist. A small area of the bank will be excavated to allow the artificial holt to be placed in it. The holt will be at least 1m back into the bank. Plastic or concrete piping will be provided from the entrance hole down to the water edge. The holt and piping will then be covered over with the excavated earth.

5.4 Bat and Bird Box Provision

10 bat and 10 bird boxes will be placed on trees along the western boundary of the site. The exact trees, orientation and height of each box will be agreed with and supervised by a supervisions ecologist.

Bat boxes to be erected are:

- 1 x 1FW Bat Hibernation Box
- 3 x Large Multi Chamber Woodstone Bat Boxes
- 3 x Eco Ket Bat Boxes

Bird boxes to be erected are:

- 3 x Vivara Pro Seville 32mm Woodstone Nest Boxes
- 3 x Vivara Pro Barcelona Woodstone Open Next Boxes
- 4 x Vivara Pro Seville 28mm Woodstone Nest Box

6. Management Responsibilities

The proposed development site owner and main contractor will have the responsibility to ensure the measures within this document are fully and continually implemented during the life time of the project. All site sub contractors must be fully inducted and made aware of the ecological constraints and required working methods.

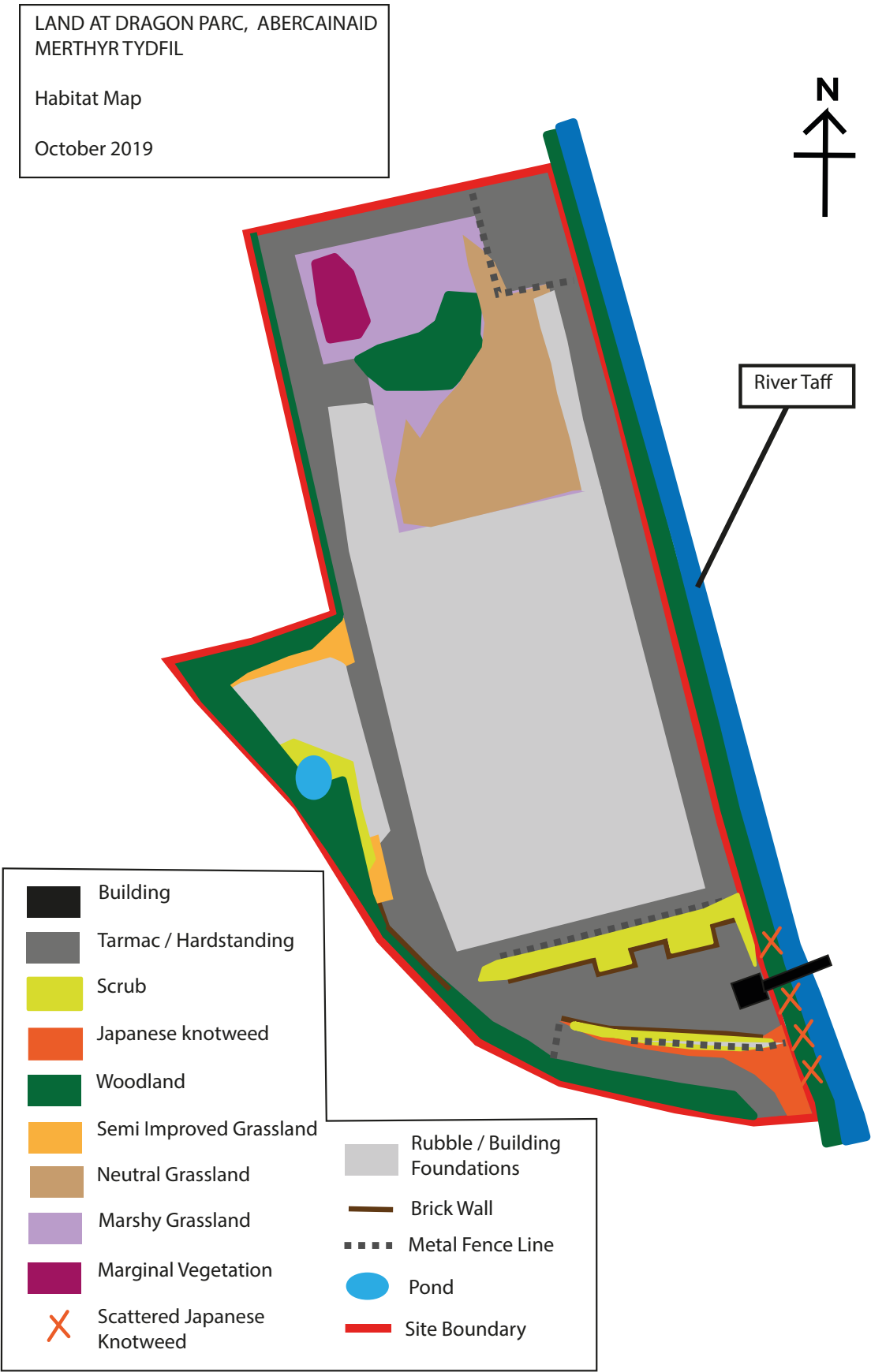
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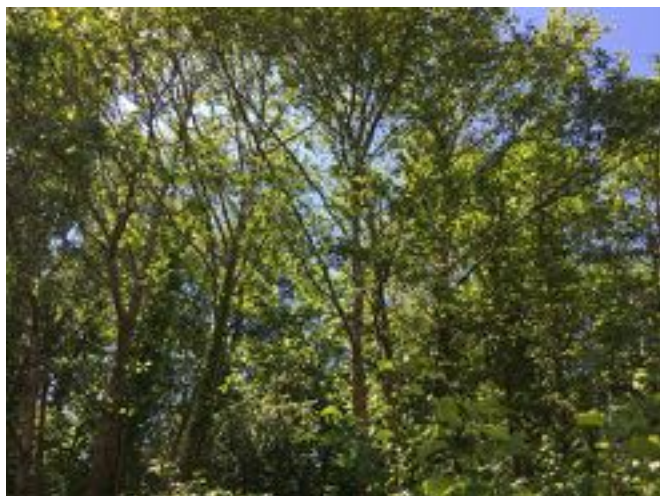
LEVEL (mAOD)	156.00	156.7	157.4	158.1	158.8	159.5	160.2	160.9	161.6	162.3	163.0	163.7	164.4	165.1	165.8	166.5	167.2	167.9	168.6	169.3	170.0	170.7	171.4	172.1	172.8	173.5	174.2	174.9	175.6	176.3	177.0	177.7	178.4	179.1	179.8	180.5	181.2	181.9	182.6	183.3	184.0	184.7	185.4	186.1	186.8	187.5	188.2	188.9	189.6	190.3	191.0	191.7	192.4	193.1	193.8	194.5	195.2	195.9	196.6	197.3	198.0	198.7	199.4	200.1	200.8	201.5	202.2	202.9	203.6	204.3	205.0	205.7	206.4	207.1	207.8	208.5	209.2	209.9	210.6	211.3	212.0	212.7	213.4	214.1	214.8	215.5	216.2	216.9	217.6	218.3	219.0	219.7	220.4	221.1	221.8	222.5	223.2	223.9	224.6	225.3	226.0	226.7	227.4	228.1	228.8	229.5	230.2	230.9	231.6	232.3	233.0	233.7	234.4	235.1	235.8	236.5	237.2	237.9	238.6	239.3	240.0	240.7	241.4	242.1	242.8	243.5	244.2	244.9	245.6	246.3	247.0	247.7	248.4	249.1	249.8	250.5	251.2	251.9	252.6	253.3	254.0	254.7	255.4	256.1	256.8	257.5	258.2	258.9	259.6	260.3	261.0	261.7	262.4	263.1	263.8	264.5	265.2	265.9	266.6	267.3	268.0	268.7	269.4	270.1	270.8	271.5	272.2	272.9	273.6	274.3	275.0	275.7	276.4	277.1	277.8	278.5	279.2	279.9	280.6	281.3	282.0	282.7	283.4	284.1	284.8	285.5	286.2	286.9	287.6	288.3	289.0	289.7	290.4	291.1	291.8	292.5	293.2	293.9	294.6	295.3	296.0	296.7	297.4	298.1	298.8	299.5	300.2	300.9	301.6	302.3	303.0	303.7	304.4	305.1	305.8	306.5	307.2	307.9	308.6	309.3	310.0	310.7	311.4	312.1	312.8	313.5	314.2	314.9	315.6	316.3	317.0	317.7	318.4	319.1	319.8	320.5	321.2	321.9	322.6	323.3	324.0	324.7	325.4	326.1	326.8	327.5	328.2	328.9	329.6	330.3	331.0	331.7	332.4	333.1	333.8	334.5	335.2	335.9	336.6	337.3	338.0	338.7	339.4	340.1	340.8	341.5	342.2	342.9	343.6	344.3	345.0	345.7	346.4	347.1	347.8	348.5	349.2	349.9	350.6	351.3	352.0	352.7	353.4	354.1	354.8	355.5	356.2	356.9	357.6	358.3	359.0	359.7	360.4	361.1	361.8	362.5	363.2	363.9	364.6	365.3	366.0	366.7	367.4	368.1	368.8	369.5	370.2	370.9	371.6	372.3	373.0	373.7	374.4	375.1	375.8	376.5	377.2	377.9	378.6	379.3	380.0	380.7	381.4	382.1	382.8	383.5	384.2	384.9	385.6	386.3	387.0	387.7	388.4	389.1	389.8	390.5	391.2	391.9	392.6	393.3	394.0	394.7	395.4	396.1	396.8	397.5	398.2	398.9	399.6	400.3	401.0	401.7	402.4	403.1	403.8	404.5	405.2	405.9	406.6	407.3	408.0	408.7	409.4	410.1	410.8	411.5	412.2	412.9	413.6	414.3	4
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Appendix 2 - Phase 1 Habitat Map



Appendix 3 - Photographs of Vegetation to be Lost



View of trees in G2 to be lost by pond



View of trees in G2 to be lost by pond



View of trees in G4 to lost by entrance road



View of trees in G4 to lost by entrance road



View of trees in G4 to lost by entrance road



Japanese knotweed along entrance road



Vegetation along river at new outfall



Vegetation along river at new outfall



Vegetation along river at new outfall

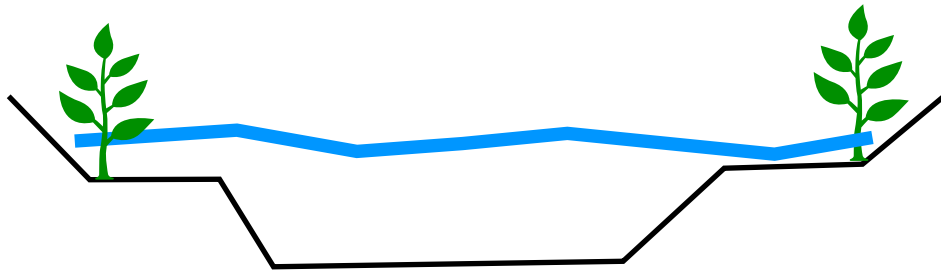


Vegetation along river at new outfall

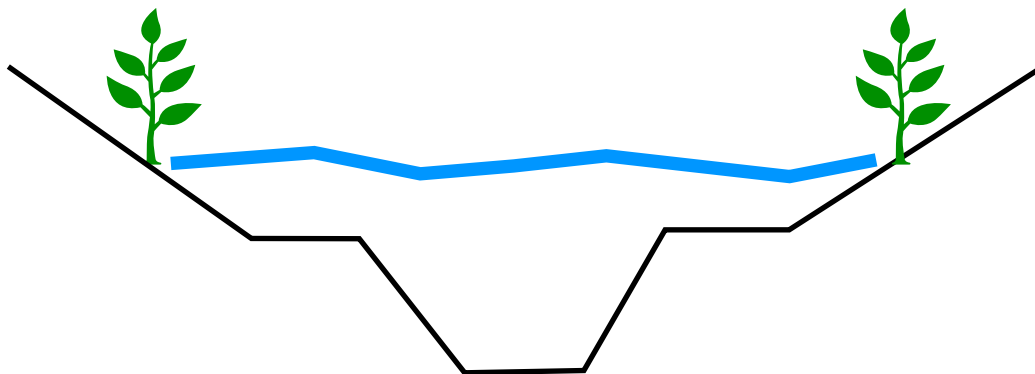


Vegetation along river at new outfall

Appendix 4 - Pond and Swale Profile



Proposed Pond Profile. A planting scheme will be designed by an appropriate specialist.



Proposed Swale Profile. Shallow banks down to water edge to allow small mammals access. Deeper profile at base to encourage a variety of vegetation and insect / animal use.

Appendix 5 - Bat, Bird and Otter Boxes



Recycled Plastic Otter Holt



Vivara Pro Seville 28mm Woodstone Nest Box



Vivara Pro Barcelona Woostone Open Nest Box



Vivara Pro Seville 32mm Woodstone Nest Box



Eco Kent Bat Box



Large Multi Chamber Woodstone Bat Box



1FW Bat Hibernation Box