

Our Picturesque Landscape

Woodland Management Plan

Pontcysyllte Aqueduct



Charles Gittins MICFor
Flintshire Woodlands
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Index

Introduction	Page 2
Objectives	Page 2
Methodology	Page 2
Ecological Survey	Page 2
Woodland & Operational Survey	Page 3
Site Description	Page 3
Access & Woodland Description	Page 3
Description of Woodland by Compartment	Page 5
Compartment 1a	Page 5
Compartment 1b	Page 6 - 7
Compartment 1c	Page 8
Compartment 1d	Page 9
Compartment 1e	Page 10
Compartment 2a, d	Page 11
Management & Operational Proposals	Page 12
Operational Details	Page 13 – 15
Implementation of Operations	Page 16
Order of Priority and Actions	Page 17
Summary	Page 18
Appendices	Page 19

Introduction

This Woodland Management Plan has been prepared on written instructions received by Charles Gittins from Our Picturesque Landscape, the Landscape Partnership Scheme led by Denbighshire County Council.

The project centres on the landscape of the Dee Valley and the Pontcysyllte Aqueduct and Canal World Heritage Site.

The woodland, known locally as Jeffrey's Wood, is situated below the Pontcysyllte Aqueduct on both sides of the pillars and both sides of the River Dee (Grid Reference SJ270421).

Objectives

The objectives of Our Picturesque Landscape are to initiate management of the woodlands in a sensitive and sustainable manner that will complement the high amenity, landscape and biodiversity value of the site.

The purpose of this report is to describe the current condition of the woodland and to put forward management proposals to restore historic local views, increase the visibility of the World Heritage Site features and to secure the long-term survival of a diverse woodland habitat.

Methodology

The site has been surveyed in two phases to collect background information for the preparation of the management plan.

Phase 1: Ecological survey

- to identify and collect baseline ecological data for species and habitats present on site
- to identify potential ecological constraints to operational work

Phase 2: Woodland and operational survey

- to prepare detailed woodland compartment notes (e.g. areas, species, condition)
- to prepare silvicultural recommendations appropriate to the site and the overall project objectives.

Ecological Survey

This survey was carried out in July 2019 and the full report is held in the Appendix (i) with relevant details featuring in the operational proposals.

The site, known as Jeffrey's Wood, is situated within the following statutory designated sites:

1. the River Dee / Afon Dyfyrddwy Site of Special Scientific Interest (SSSI)
2. the River Dee and Bala Lake / Afon Dyfyrddwy a Llyn Tegid Special Area of Conservation (SAC)
3. Clwydian Range and Dee Valley / Bryniau Clwyd a Dyffryn Dyfyrddwy Area of Outstanding Natural Beauty (AONB)
4. Pontcysyllte Aqueduct Conservation Area

Woodland and Operational Survey

This survey was carried out during various site visits (April – October 2019) and is detailed below.

Site Description

The woods are situated on both sides of the River Dee with approximately 4.6 hectares to the North and 0.51 hectares to the South.

The woodlands border agricultural land to the South of the river, residential areas to the North West and East and a redundant industrial site to the North East.

The elevation ranges from about 60 metres above sea level on the river bank to about 100 metres on the Northern edges.

Access

Access to the site from the West is restricted to foot only but there may be small scale vehicular access from the East over adjacent property, subject to formal confirmation.

The access within the majority of the woodland is restricted to narrow footpaths, descending by steps from the higher ground around the Trevor canal basin in the North and adjacent land in the North East.

Woodland Description

Background information

The woodlands are dominated by the area of mature oak woodland along the northern slopes and the riverbank with adjacent areas that appear to be a combination of natural regeneration, small groups of planted broadleaved species and individual mature trees across the non-wooded areas.

There appears to have been very little recent management apart from essential work to keep paths clear but old cut stumps indicate there has been some form of historic intervention.

Figure 1: extract from 1870 map



The majority of woodland to the North of the River Dee is recorded as being Ancient Woodland and this clings to a steep slope (25 -30 degrees) along the North of the site with a narrow linear area along the riverbank. The central area appears to have colonised within the last century by woodland and scrub.

To the South of the River Dee the area to the West of the Aqueduct is classified as Ancient Woodland and the area to the East, though broadleaved woodland, is unclassified.

The map in Figure 1 (woodland area shown edged red) above shows the indicative landscape adjacent to Pontcysyllte Aqueduct in 1870. It appears that on both sides of the pillars on the North side of the river there was open ground.

A detailed description of the woodland is given below.

Description of the woodland by compartment

See Appendix ii for sub compartment database and maps

Compartment 1a: estimated 2.45 hectares (Ancient and Semi Natural Woodland status)

This large area of woodland, situated on the steep northern slopes, is dominated by mature oak with scattered ash, wild cherry, sycamore and beech in the main canopy and a variety of mixed native broadleaves in the understorey. The light levels reaching the woodland floor are variable and this is reflected by the extent of the ground flora.



Photograph 1

Mature oak with hazel, holly, sycamore, elm understorey

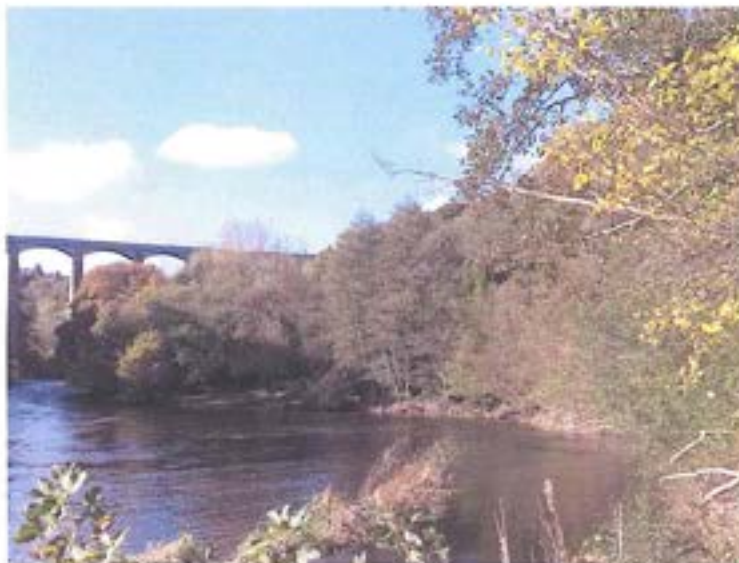
Condition

The oak is healthy with no apparent signs of concern whereas a proportion of the ash are showing signs of senescence, and possibly *Chalara*, and the over mature wild cherry typical signs of a reduction in vigour.

There is a dense group of Japanese knotweed along the stream that forms the eastern boundary.

Compartment 1b: estimated 0.61 hectare (Ancient and Semi Natural Woodland status)

This area of riparian woodland is mainly oak (*Quercus robur*) with scattered alder, willow, sycamore and ash plus a range of shrub species (hazel, willow, elder).



Photograph 2

Mature oak with scattered alder, ash, sycamore & willow and mixed broadleaved understorey



Photograph 1

To show drawn up under storey and ground vegetation on riverbank

At the very western end of the compartment there is a narrow watercourse that runs into the river from the North (see photo 4 below)



Photo 4

Watercourse along western end of Cpt 1b

Condition

The mature oak trees are of similar age class and appear in good health whereas the understorey of coppice grown alder, willow, hazel is a range of ages with older clumps starting to collapse. The tree and shrub cover are dense and obscure visibility to the river from the pathway.

There are groups of Japanese knotweed and Himalayan balsam along the riparian zone.

Compartment 1c: estimated 0.12 hectare (non-Ancient and Semi Natural Woodland status)

This is a small area of broadleaved woodland, mainly wild cherry, that appears to have been planted 20 to 30 years ago with an understorey of hazel and elder that has developed naturally.



Photograph 5

Planted wild cherry with drawn up mixed broadleaved under storey

Condition

The woodland is unthinned with a dense understorey and branches overhanging and shading the adjacent footpath

Compartment 1d: estimated 0.87 hectare (non-Ancient and Semi Natural Woodland status)

This is an area of mixed broadleaved woodland that appears to have established naturally over the last 150 years with areas of bracken that have remained as open glades.

The main canopy species are ash, birch, sycamore, wild cherry and alder with groups of grey willow on wetter sites. There is a varied shrub understorey of field maple, hazel, elm coppice, elder and holly with a dense field layer, particularly in areas without tree canopy.



Photograph 6

To show bracken in open glades within matrix of birch, ash and mixed broadleaves

Condition

The main part of this woodland is dense with significant natural regeneration of shrub and tree species. As a result, most of the site is impenetrable, particularly the areas of collapsed grey willow at the West of the site.

There is an overgrown hedge/line of trees (field maple, elm hazel) parallel to the footpath at the western end of the compartment that is likely to be the original field margin (see photo 7 below).



Photograph 7

To show old hedge bank/field edge at western along western edge parallel to the aqueduct and footpath.

Compartment 1e: estimated 0.55 hectare (non-Ancient and Semi Natural Woodland status)

This is an area of mixed broadleaved woodland similar to Compartment 1d that appears to have established naturally over the last 150 years in what was open ground adjacent to the aqueduct. The main species are ash and willow with scattered mature oak and a dense understorey throughout making the area impenetrable apart from a series of worn pathways.

There is an overgrown hedge/line of trees (field maple, elm hazel) along the southern edge to be the original field margin / landscaping associated with the aqueduct.

There is also a vaguely distinguishable pathway that links up with the riverside path to the East of the aqueduct.

Condition

The area has colonised heavily with broadleaved shrub and tree species but the original oak trees that probably date back to the building of the aqueduct can be found along the western edge of the structure.

There is a prominent mature ash tree close to the Northern end of the aqueduct, currently of high amenity value, and should form part of the inspection regime.

There are several mature willow that are in a state of collapse.

Compartment 2a: estimated 0.38 hectare (Ancient and Semi Natural Woodland status)

This area of woodland, situated on the steep southern bank of the River Dee is dominated by mature oak with scattered ash, wild cherry, sycamore and beech in the main canopy and a variety of mixed native broadleaves in the understorey. The light levels reaching the woodland floor are variable and this is reflected by the varied extent of the ground flora.



Photo 7: looking due East downstream from Pont Cysyllte to the aqueduct

Condition:

This area is mostly mature oak but does contain a proportion of ash and, though healthy at the moment, are susceptible to *Chalara*.

The steep site and branches overhanging the river makes it very difficult / impossible to carry out safe operational work over much of the area but the woodland forms part of the traditional local landscape and does not detract from the local views of the aqueduct from the bridge.

Compartment 2b: estimated 0.13 hectare (non-Ancient and Semi Natural Woodland status)

This area forms a narrow riparian woodland to the East of the aqueduct pillars and though similar in species mix to Compartment 2a is likely to be younger.

There is a larger component of ash and sycamore than Compartment 2a.

Management and Operational Proposals

The site appears to have received minimal woodland management in recent years apart from maintenance of the access routes for pedestrian use.

Since the construction of the aqueduct (1795-1805) the woodland cover has both matured and extended as a result of natural regeneration of shrub and tree species into what was open ground. In addition, the old field boundary hedges / hedge banks have matured and extended into adjacent open ground.

The development of scrub woodland, particularly on the North banks of the river has restricted visibility of the aqueduct pillars both locally and from further afield.

Viewpoints

The operational proposals have been prepared to both improve the woodland condition and increase the views of the aqueduct in and around the area.

The main viewpoints in the locality are considered to be: (See Map 10 in Appendix)

1. the old Pont Cysyllte bridge to the West of the aqueduct
2. the high ground of Cefn Mawr and Cefn Bychan to the East
3. the main pathways that lead up to the pillars from the East
4. a partial viewpoint from the footpath that runs along the North edge of Compartment 1a.

Operational Proposals

The proposals involve significant work within the locality of the aqueduct that will open up views close to the structure whereas opening up the views from further afield to the East (i.e. Cefn Mawr and Cefn Bychan) is more challenging because of the overall height growth of the woodlands since the construction of the aqueduct.

The woodland management proposals are detailed below on a compartment basis and identified on the associated maps in Appendix (ii), Maps 6, 7, 8 & 9.

All work should be undertaken as per the British Standard 3998:2010 'Tree Work Recommendations' and in accordance with industry guidance and best practice.

Specific details of operational work e.g. height of pruning / % crown reduction / stocking levels per hectare will need to be specified clearly in all operational documentation (i.e. tenders and contracts).

Table 1

Compartment	Map No.	Work Item	Description	Work proposal details <i>All work to be quantified prior to commencement under British Standard 3998:2010 and identified on the ground</i>	Priority
Site	General		Baseline tree survey along all access routes	Ground level non-intrusive tree survey	1
1a	6	1	Mature ash on edge of path	Fell	1
	6	2	Group of young ash/sycamore on edge of path	Fell	1
	6	3	Mature ash on edge of path	Fell	1
	6	4	Obscured viewpoint	High prune / crown lift edge trees and coppice undergrowth	2
	6	5	Coppice growth encroaching on steps	Coppice 2 metres width on both sides of path	2
	6	6	Branches & understorey overhanging brick channelled stream	Coppice understorey and high prune overhanging branches to clear route of stream	3
	6	7	Japanese Knotweed encroachment along edge of stream	Clear (according to current guidelines) plus follow up control	1

	6	8	Mature ash in high canopy along North edge of Cpt 1a	The high canopy of the oak woodland prevents visibility of the aqueduct from the Cefn Mawr direction. Felling of oak stems is not recommended due to the biodiversity value. Identify ash trees within the high canopy to be felled for tree health reasons (i.e. <i>Chalara</i>) to create permeated visibility of the aqueduct through the remaining canopy.	1
<i>*area of woodland to North East of Cpt 1a</i>	6	9	Potential individual/groups of trees in the main canopy that may be restricting visibility of the South section of the aqueduct from Cefn Mawr	This section of woodland in same ownership as Jeffrey's Wood. Identify trees with significant crowns that are obstructing views from Cefn Mawr.	1
1b	7	1	Overgrown hedge along old field boundary	Coppice & reinstate as low hedge	1
	7	2	Group of Himalayan balsam	Pull from ground before seeding / remove from site or pile up	1
	7	3	Route of old pathway	Clear shrub along route	1
	7	4	Dense understorey of broadleaved shrubs	Coppice 50% on x5 year cycle	1
	7	5	Overgrown hazel / field maple hedgerow	Coppice and maintain as low hedge to reveal aqueduct pillars from pathway	1
	7	6	Semi mature oak near to pillar	Remove deadwood and raise crown	2
	7	7	Mature ash in edge of path	Fell	1
	Map No.	Work Item	Description		
	7	8	Group of sycamore natural regeneration & over mature hazel	Fell sycamore / treat stumps and coppice hazel	1
	7	9	Remnant oak stems + natural regeneration of sycamore, willow, alder	Retain oak (remove deadwood), fell willow & sycamore and selective thin circa 50% of alder stems / stack timber as habitat piles	2

Compartment	Map No.	Work Item	Description	Work proposal details	
				<i>All work to be quantified prior to commencement under British Standard 3998:2010 and identified on the ground</i>	
	7	10	Japanese knotweed	Clear plus follow up control	1
1c, d, e	8	1	Mature ash adjacent to aqueduct	Inspect crown for deadwood / monitor for dieback and potential fell	1
	8	2	Group 3x ash along retaining wall	Fell and remove	1
	8	3	Overgrown hedgerow	Coppice / stack timber / chip branch wood or stack as habitat Maintain as low hedge to reveal aqueduct pillars from pathway	1
	8	4	Group of mature and unstable willow	Fell all unstable willow / consider 'hinge' fell up slope to assist with retention of timber during floods / consider treatment of a selection of stumps to prevent regrowth / coppice 50% of understorey / stack arisings as habitat piles	2
	8	5	Group of semi mature ash, sycamore, birch & understorey	Fell ash, selective thin 25% sycamore & birch / coppice 25-50% of understorey / stack arisings as habitat piles	3
	8	6	Remnant oak with elm coppice and naturally colonised ash, willow, birch and understorey	Retain oak (remove deadwood), fell ash / thin 25% of sycamore & birch / stack arisings as habitat piles	1
	8	7	Wild cherry & hazel / elder understorey	Selective thin 50% of cherry stems / coppice 50% of understorey / stack timber as habitat piles / stack arisings as habitat	1
2a	9	1	Eastern end of Cpt 2a: Mature broadleaved woodland on riverbank & understorey of hazel /hawthorn	Crown lift 25-50% of mature trees closest (circa 50m) to aqueduct pillars / coppice 50% of understorey / stack arisings as habitat	3
	9	2	Western end of Cpt 2a: Mature broadleaved woodland on riverbank & understorey of hazel /hawthorn	Crown lift circa 50% of mature trees adjacent to public road (circa 20m) / coppice 50% of understorey / stack arisings as habitat	3

The felling operations will yield reasonably volume (estimated 25m³) but lack of access will inevitably mean that stable timber stacks / habitat piles will need to be constructed and retained.

There is scope for limited access by tracked chipper machine and this will allow the chipping of branch wood / small diameter timber to where site clearance is required (the majority of material will be left as unchipped as habitat piles and out of reach of flood waters).

The chipped material must be contained out of reach of flood waters and also in appropriate areas to avoid a mulching effect that will restrict the success of natural regeneration.

The current paths are narrow and the canopy restricts light and air currents resulting in much of the route remaining wet and slippery. There is scope for creating a more 'scaloped' margin along the edges of the paths, this will create a more varied experience and, in conjunction with thinning, allow visibility into and through the woodland towards the aqueduct pillars and also the River Dee.

The dense woodland tends to create a feeling of enclosure and the enjoyment of this area may be improved by opening up the woodland edge. The disruption caused by tree felling operations may be a contentious issue and would have to be discussed with the general public but there is scope for improving the visitor enjoyment and the woodland condition at the same time.

Implementation of proposed management operations

Statutory Requirements and Permissions

There should be an initial period of consultation prior to the commencement of any woodland operations. This would include both local public consultation and consultation with statutory and non-statutory bodies to identify any relevant designations and associated constraints, in this case:

- Site of Scientific Interest (River Dee) – Natural Resources Wales
- Conservation Area – Wrexham Council

The majority of tree felling will require a Felling Licence Agreement with Natural Resources Wales and this will be produced after the statutory consultation to ensure consistency with site management.

There will be a requirement for the temporary closure of active sites with appropriate notices of warning and public awareness.

The proposals for this site will involve a significant amount of work in the first 5-year period (majority in Years 1 -3) and an ongoing programme of maintenance work.

The proposals involve disturbance that most visitors to the woodland will probably be unfamiliar with and therefore Public Consultation and a Statement of Objectives is paramount to the successful implementation of the operations and the success of the project.

The work will be on going and the site will require regular attention and monitoring of progress in relation to the objectives.

The operations and maintenance work require competent operators for safe and effective results. The work will need to be carried out in a sensitive manner (as per the guidelines set out earlier) and it is appropriate to

carry out the work in stages over the first 5-year period. The bird breeding season should be avoided if possible, restricting work to the August – March period.

A suitable monitoring programme will measure the response of the woodland (e.g. establishment of natural regeneration, and development of competitive species such as bramble and sycamore) and should be able to gauge the progress towards the targets of the management plan.

A weed control programme will be required to control the invasive weeds and possibly around natural regeneration to ensure successful establishment.

The programme of works should be divided into individual contracts that can be quantified and these details would be circulated to appropriate interested parties as a tendering process. The selection of operators should be based on appropriate experience, certification and insurance cover.

Order of priority of proposed woodland operations

The programme of works will require prior approval, as described above, by the landowner / landowner's representative in addition to statutory permissions.

The landowner's authorisation and local consultation will enable the work items to be marked up on site for identification by contractors during the quotation for works phase.

In the interim period a proposed order of works has been scheduled by colour coding of 1 (red), 2 (green) and 3 (yellow) in Table 1 above with the intent of early delivery of the main objectives i.e. improving the local views of the aqueduct from Pont Cysyllte in the West and Cefn Mawr in the East.

Code 1 (red) is recommended for completion in Years 1 and 2 to provide significant improvement in the localised views of the aqueduct.

The order of priority of silvicultural work is debatable but the proposal would be to sub divide the area into working circles and manage on a rotational basis according to budgetary and operational limitations.

It is important that after each work item has been completed the work area is inspected for safety before any subsequent work is carried out and certainly before public access is resumed. The scale and timing of activity will need to be considered as periods of inactivity will be appreciated by visitors to the woodland.

Action

1. Confirmation of Landowner agreement to operational detail in Table 1
2. Approval by Landowner of Agent Authority to enable agent to submit relevant licence and permit application in relation to the proposed works
3. Consultation with Landowner representative to agree project phases
4. Site visit to identify and mark the proposed works (to include baseline survey of tree safety adjacent to main access infrastructure)

5. Preparation of tender / quotation document for circulation to approved contractors
6. Consultation with Landowner representative to consider tender / quotation results
7. Implementation of works

Summary

The proposals for this site will increase the local visibility of the Pontcysyllte Aqueduct and also allow significant improvement to the biodiversity.

- There should be consultation with local community and statutory bodies
- Management will be restricted to thinning to maintain continuous canopy cover and reduce disturbance to the site
- Some of the woodland will be left unmanaged /undisturbed (inaccessible areas away from footpaths)
- Management will favour the retention of the full range of site-native species.
- Existing fallen deadwood will be retained within the wood and the majority of felled timber will be retained on site to create habitat piles for invertebrates
- Maiden trees will be retained to develop into veteran trees with associated epiphytic lichen and bryophyte communities
- The bird breeding season will ideally be avoided during woodland operations (i.e. operations should be confined to the August-March period)
- Natural regeneration is to be encouraged, resorting to direct planting with trees of local seed origin if necessary.
- The proposals will help develop the social and economic well being of local communities

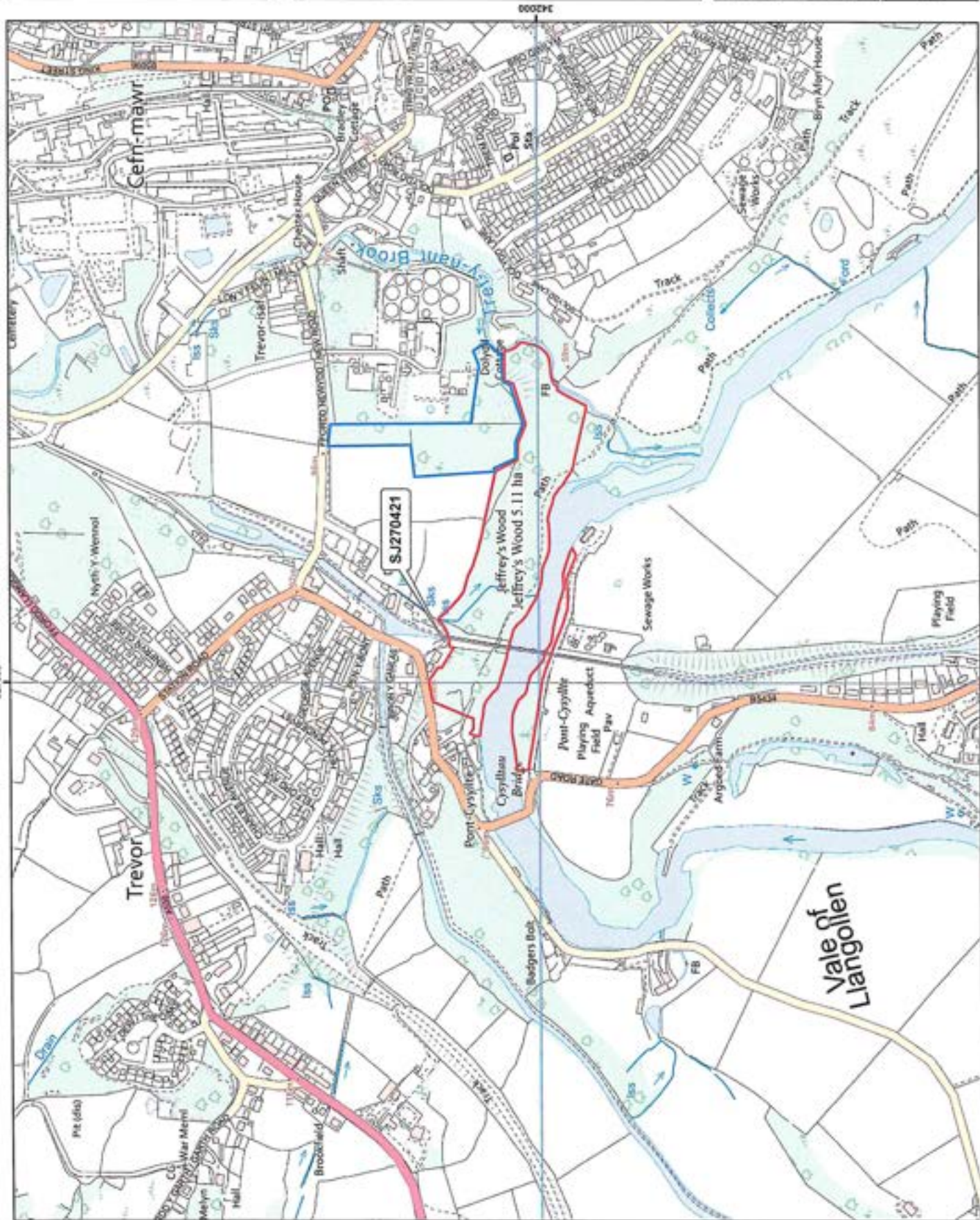
Appendix (i)

Map 1:	Location & Boundary
Map 2:	Indicative Historic Woodland Structure
Map 3:	Current Woodland Structure
Map 4:	Environmental Designation
Map 5:	Constraints & Hazards (known)
Map 6:	Cpt 1a Operations
Map 7:	Cpt 1b Operations
Map 8:	Cpts 1c, d, e Operations
Map 9:	Cpt 2a, b Operations
Map 10:	Key Views

Pont Cysyllte Aqueduct
Woodland Plan
Map 1
Woodland location and
boundary
(Jeffrey's Wood)

Woodland boundary of
project area

Boundary of adjacent
woodland within same
ownership of Jeffrey's
Wood

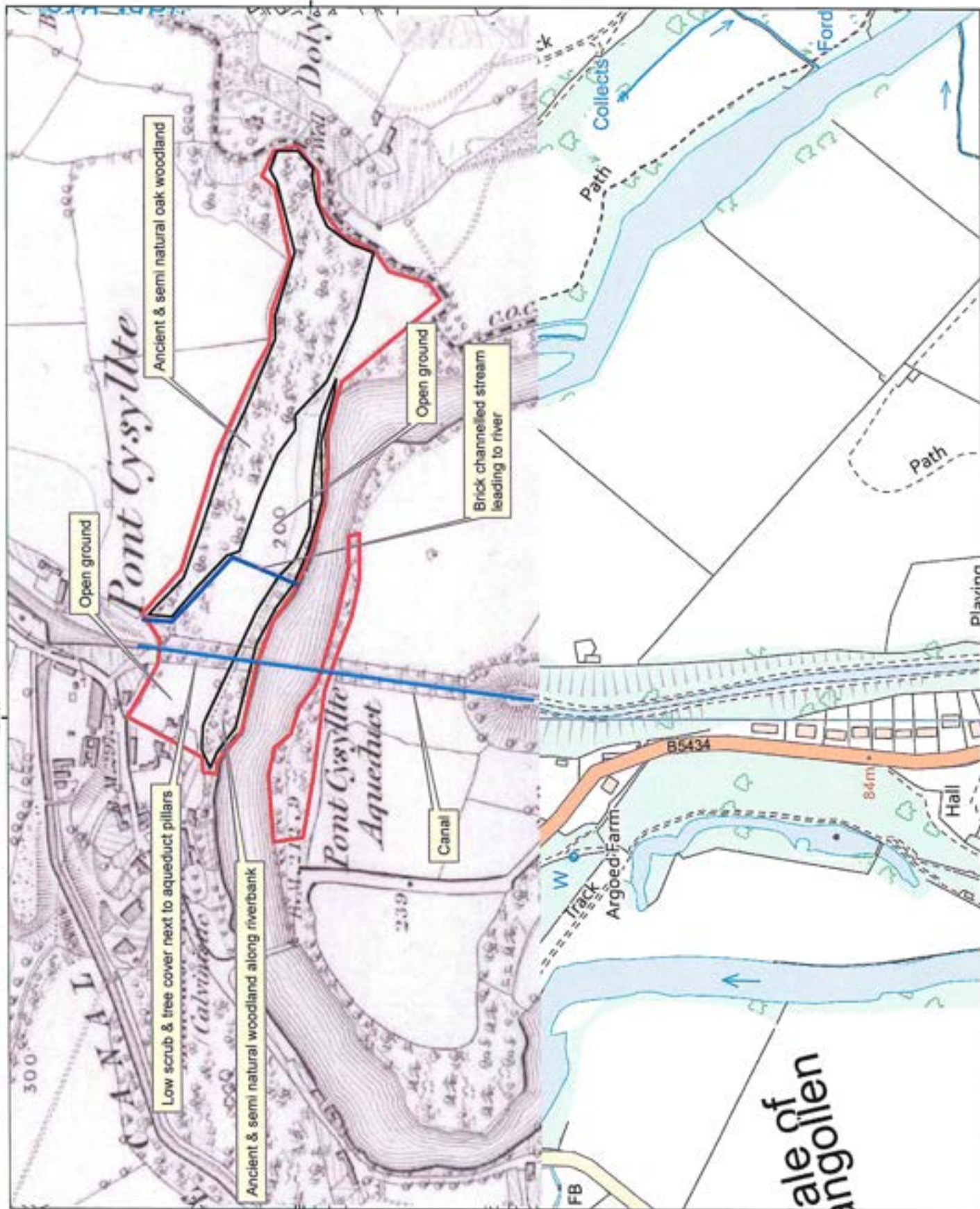


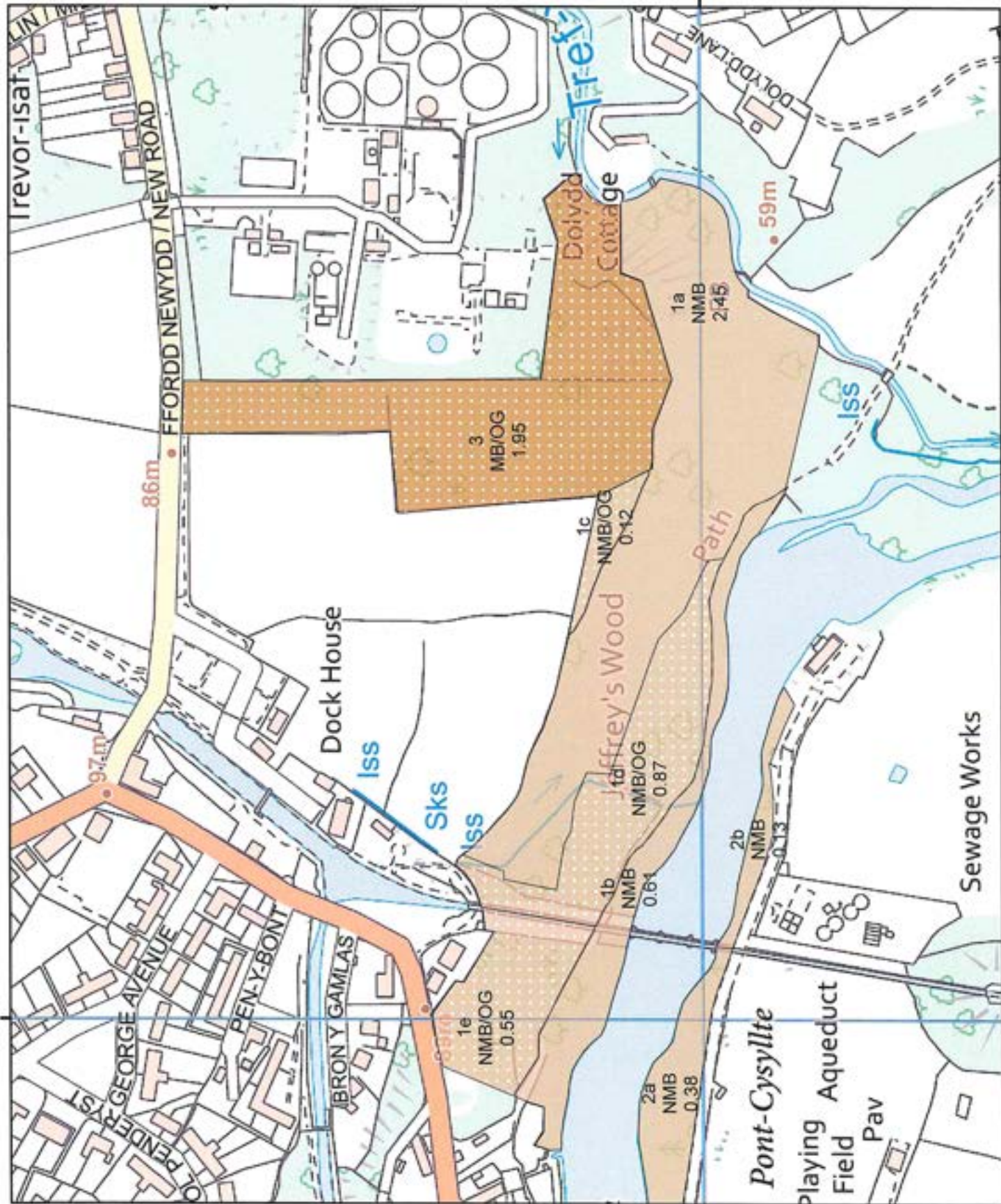
Pont Cysyllte Aqueduct
Woodland Plan
Map 2
1870 map extract:
Indicative Historic
Woodland Structure

Woodland boundary



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Scale Correct at A3

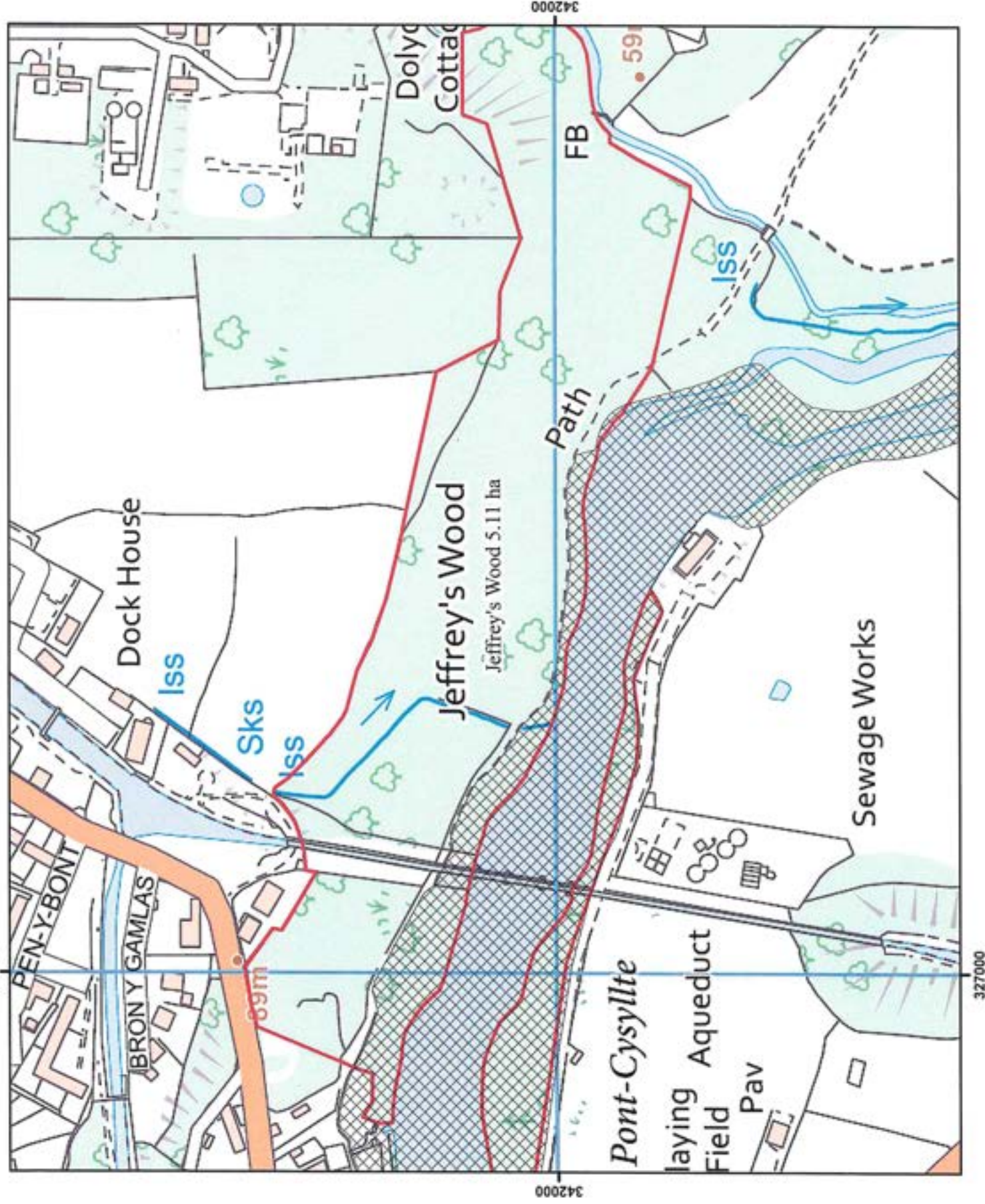




Pont Cysyllte
Aqueduct
Woodland Plan
Map 3
Compartment Map
and
Current Woodland
Structure

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Edinburgh, EH14 4AP
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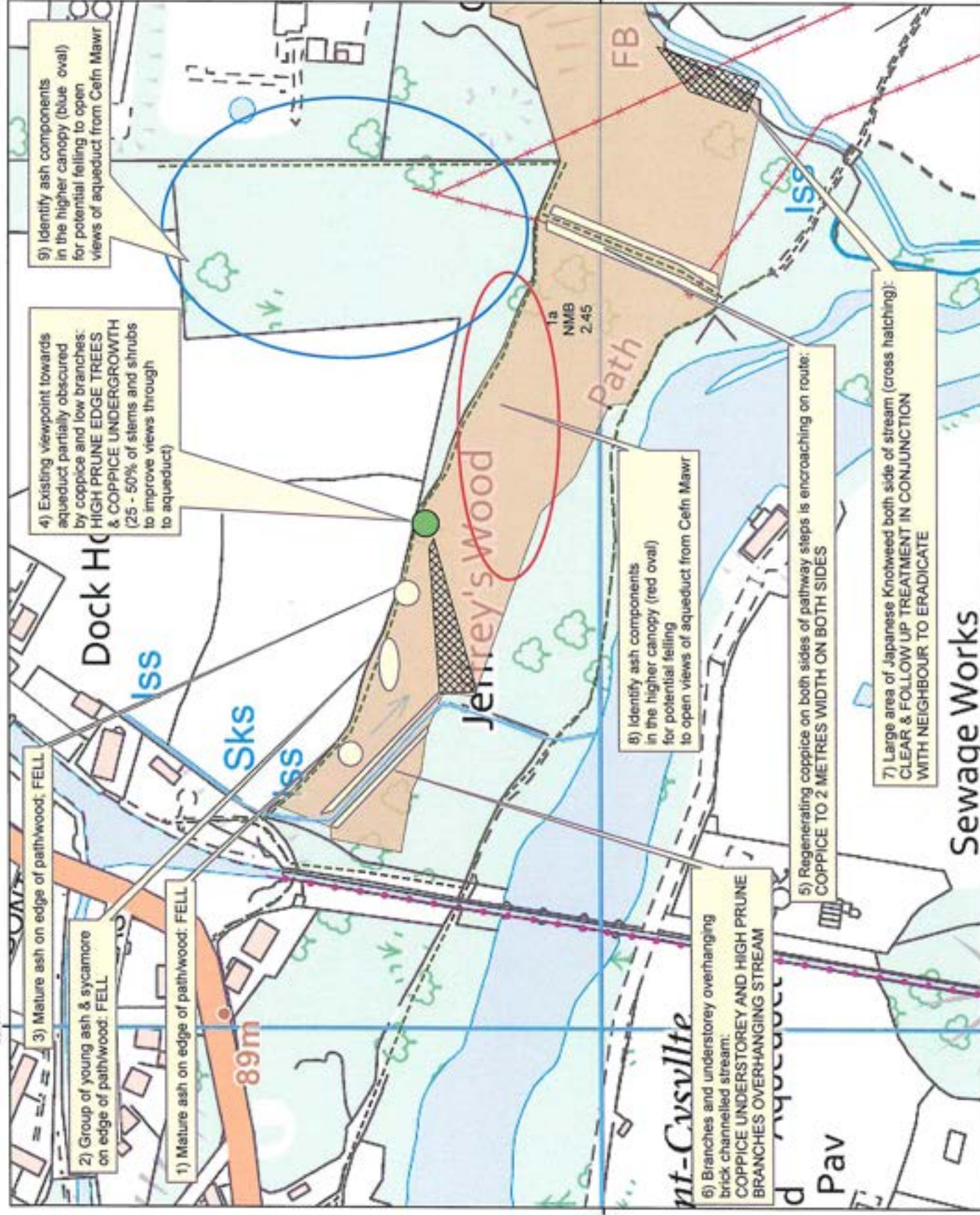
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Pont Cysyllte
Aqueduct
Map 6
Compartment 1a
operational details

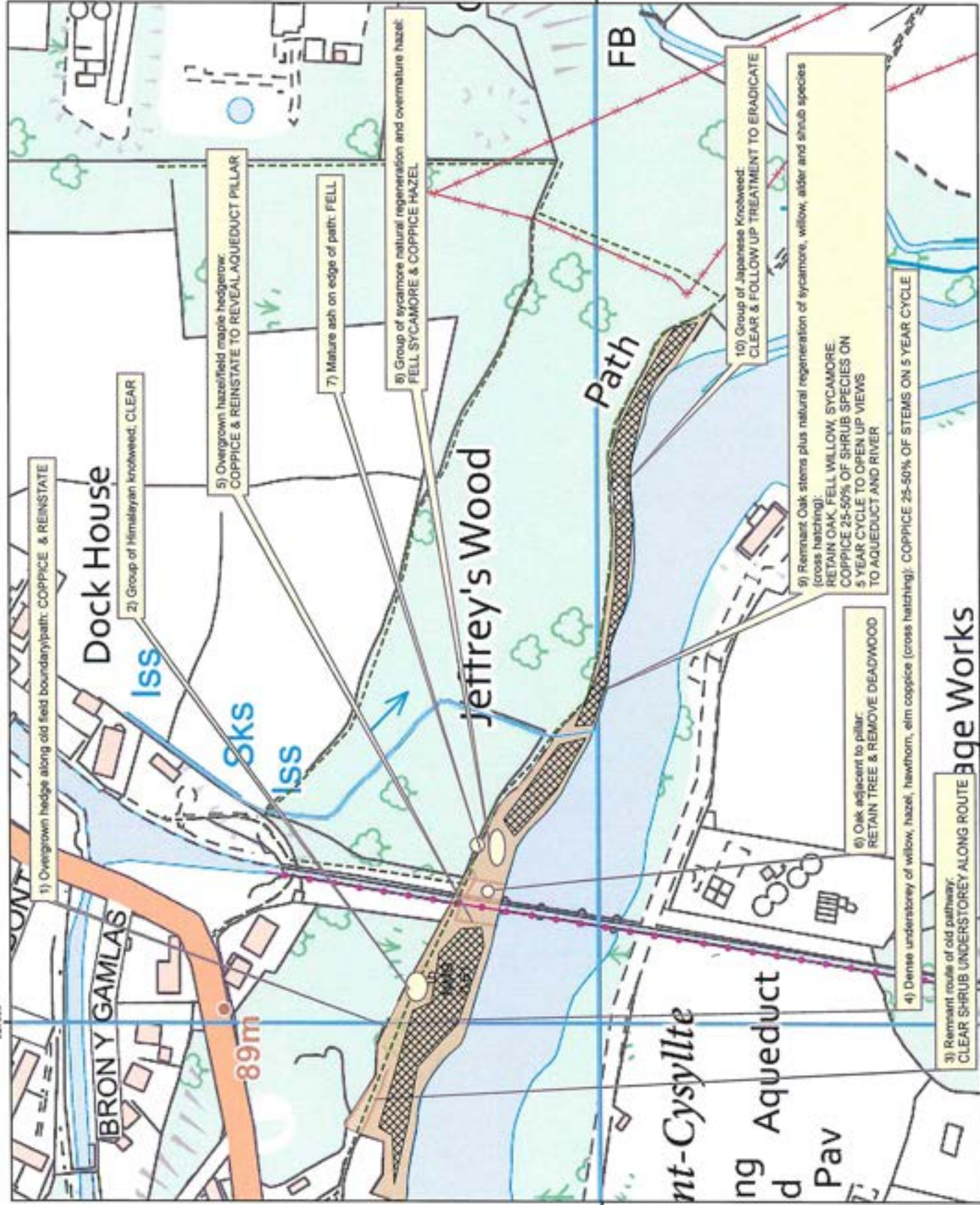
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Sewage Works

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Pont Cysyllte
Aqueduct
Map 7
Compartment 1b
operational details

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Age Works

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Pont Cysyllte Aqueduct

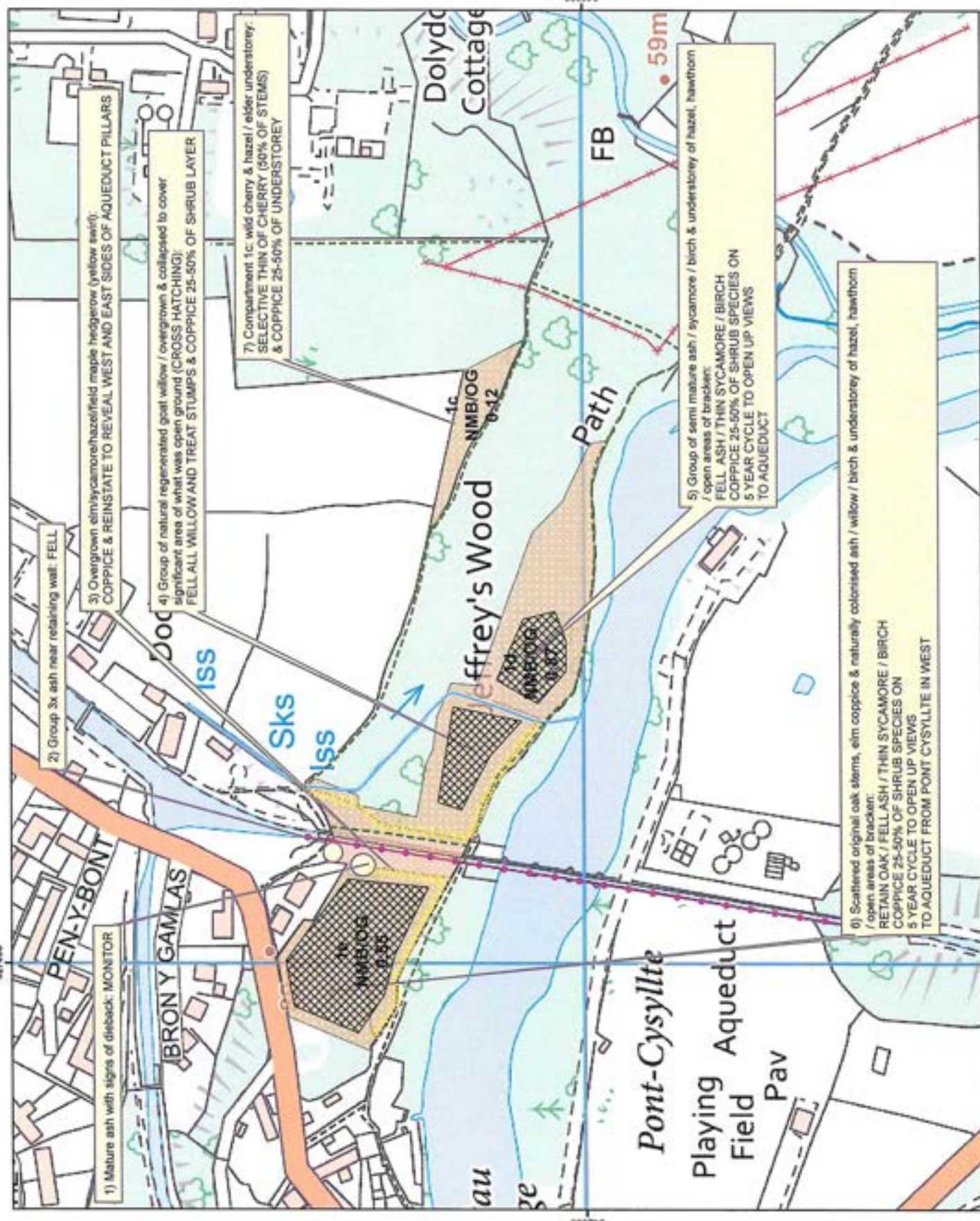
Map 8

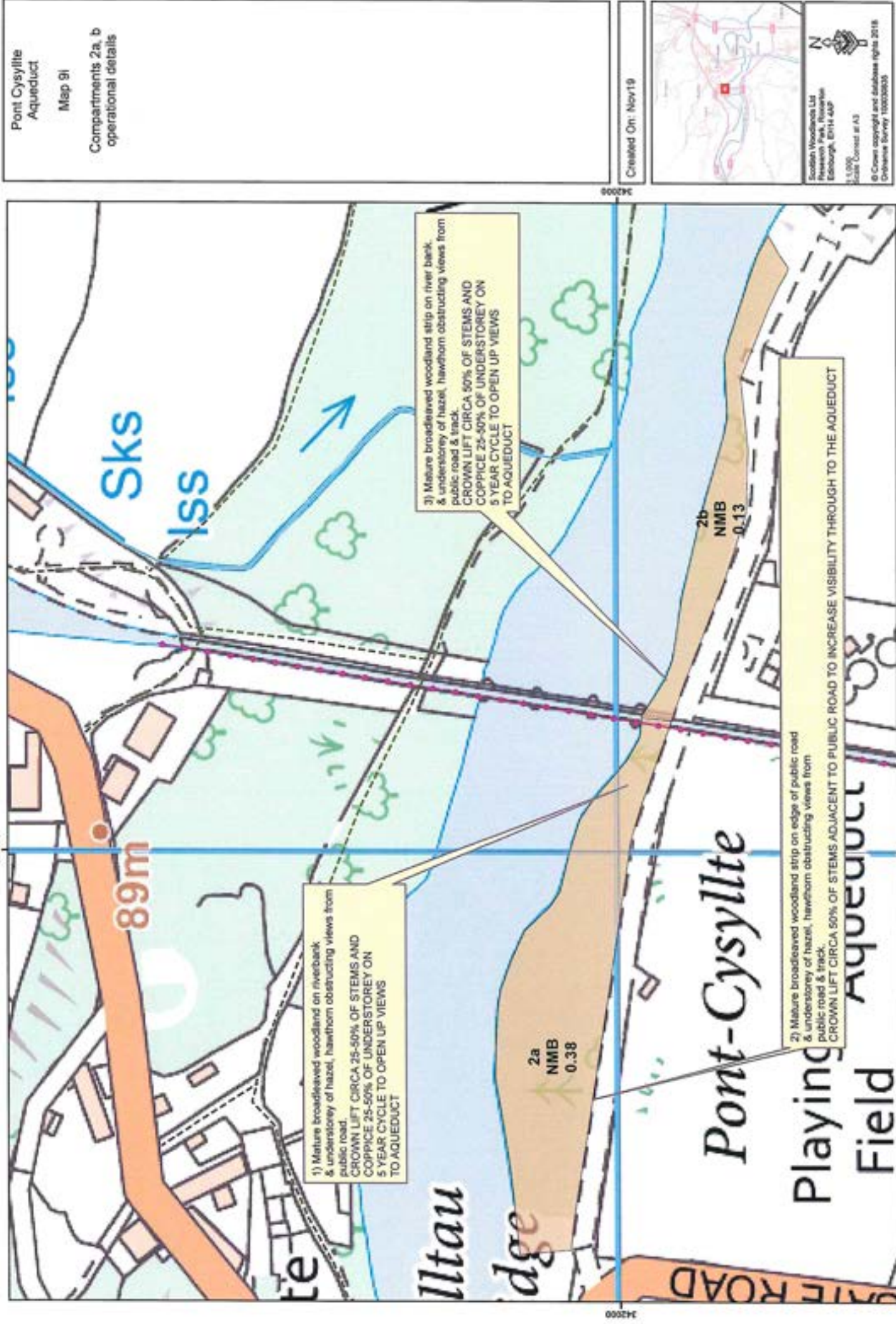
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operational details

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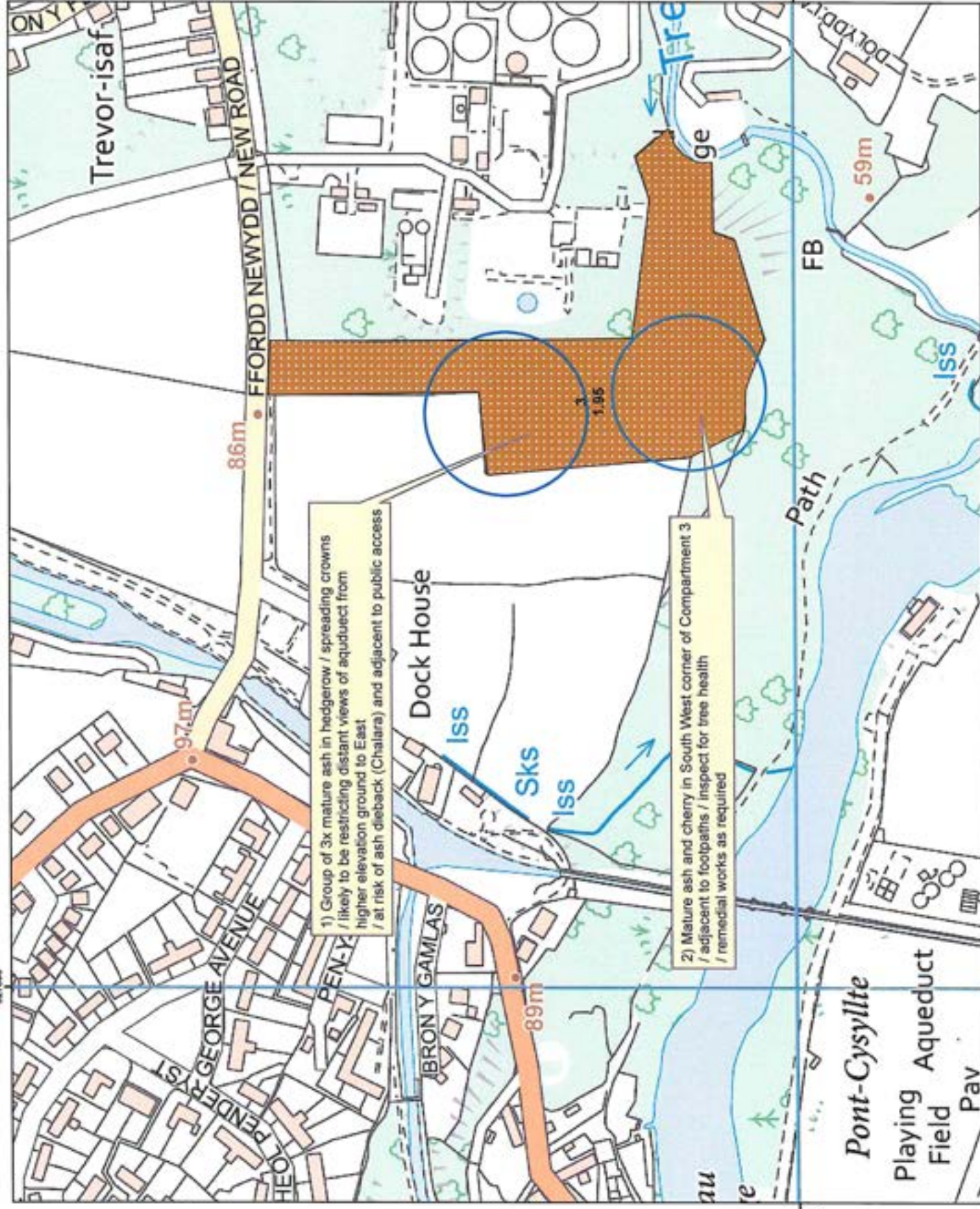


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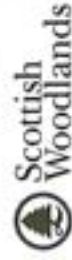


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Pont Cysyllte Aqueduct

Map 9ii

Compartment 3
operational details

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