MetroWest

Portishead Branch Line (MetroWest Phase 1)

TR040011

Applicant: North Somerset District Council
6.25, Environmental Statement, Volume 4, Appendix 9.13 to 9.18, Ecology and Biodiversity
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, regulation 5(2)(a)
Planning Act 2008

Author: CH2M
Revision: Version 4
Date: April 2021

NetworkRail · West of England Local Enterprise Partnership · West of England Combined Authority · HM Government · Bath & North East Somerset Council · Bristol City Council · North Somerset Council · South Gloucestershire Council · travelwest

Notice

Limitation: This document has been prepared on behalf of, and for the exclusive use of Jacobs' client, and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and the client. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this document by any third party.

Where any data supplied by the client or from other sources have been used, it has been assumed that the information is correct. No responsibility can be accepted by Jacobs for inaccuracies in the data supplied by any other party. The conclusions and recommendations in this report are based on the assumption that all relevant information has been supplied by those bodies from whom it was requested. Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work. This work has been undertaken in accordance with the quality management system of Jacobs.

Document history

Project	Portishead Branch Line (MetroWest Phase 1) Development Consent Order Scheme
Planning Inspectorate Scheme Reference	TR040011
Part and Application Document Reference	6, 6.25
Document titles	Environmental Statement, Volume 4, Appendix 9.13 Reptile and Amphibian Mitigation Strategy Appendix 9.14 Hedgerow Survey Appendix 9.15 Network Rail Site Management Statement, Vegetation Management Plan and Habitats Regulations Assessment for the Avon Gorge Appendix 9.16 The Portbury Hundred Proposed Tree Planting Appendix 9.17 Lighting Survey Report Appendix 9.18 Lux lighting plans for Pill Station car park and highways
Regulation Number	Regulation 5(2)(a)
Applicant	North Somerset District Council
Lead Author	Appendix 9.13 and 9.16 CW at CH2M, Appendix 9.14 RT at CH2M, Appendix 9.15 Network Rail and Appendix 9.17 and 9.18 SM at CH2M

Version	Date	Status of Version
01	11/11/19	Application Issue
02	24/7/20	Update reptile mitigation presented in Appendix 9.13
03	15/3/21	Included amphibian mitigation in Appendix 9.13
04	12/4/21	Final version of the Appendix 9.13 including details of the toad surveys conducted in February and March 2021

MetroWest

Portishead Branch Line (MetroWest Phase 1)

TR040011

Applicant: North Somerset District Council
6.25, Environmental Statement, Volume 4, Appendix 9.13 Reptile and Amphibian Mitigation Strategy
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, regulation 5(2)(a)
Planning Act 2008

Author: CH2M

NetworkRail · West of England Local Enterprise Partnership · West of England Combined Authority · HM Government · Bath & North East Somerset Council · Bristol City Council · North Somerset Council · South Gloucestershire Council · travelwest

Table of Contents

Figure(s)

Acronyms and Abbreviations

B&NES	Bath and North East Somerset
BCC	Bristol City Council
CEMP	Construction Environmental Management Plan
DCO	Development consent order
EcCoW	Ecological Clerk of Works
ES	Environmental Statement
NERC Act	Natural Environment and Rural Communities Act 2006
NR	Network Rail
NSIP	Nationally Significant Infrastructure Project
SAC	Special Area of Conservation
SGC	South Gloucestershire Council
SSSI	Site of Special Scientific Interest
WCA	Wildlife and Countryside Act 1981
WECA	West of England Combined Authority

SECTION 1

Introduction

1.1 Background to the DCO Scheme

1.1.1 North Somerset District Council ("NSDC") is making an application for a development consent order ("DCO") to construct the Portishead Branch Line under the Planning Act 2008. The DCO Scheme will provide an hourly (or hourly plus) railway service between Portishead and Bristol Temple Meads, with stops at Portishead, Pill, Parson Street and Bedminster.

1.1.2 The scheme is one of several projects that form part of MetroWest, a programme of rail improvements in the West of England. MetroWest Phase 1 is being led jointly by NSDC and the West of England Combined Authority ("WECA")[1], as a third party promoted rail project, funded by the authorities and devolved funding sources from central government. The West of England Authorities are working with Network Rail ("NR"), Great Western Railway and the wider rail industry to deliver the MetroWest Programme.

1.1.3 The Portishead Branch Line was built in the 1860s. Passenger services continued between Portishead and Bristol until 1964, and freight services continued to 1981. The Royal Portbury Dock opened in 1978 and in 2002 the currently operational part of the former Portishead Branch Line was re-opened to service the port for freight only. The owner of the Royal Portbury Dock, Bristol Port Company, has commercial rights to run up to 20 freight trains per day in each direction along the operational railway line. The current volume of freight trains operating is substantially less than this. The section of the railway between Portishead and Pill remains disused.

1.1.4 The DCO Scheme comprises the nationally significant infrastructure project ("NSIP") as defined by the Planning Act 2008 to construct a new railway between Portishead and the village of Pill, and associated works including a new station and car park at Portishead, a refurbished station and new car park at Pill and various works along the existing operational railway line between Pill and Ashton Junction where the scheme will join the existing railway. Ashton Junction is located close to the railway junction with the Bristol to Exeter Mainline at Parson Street.

1.1.5 Further information on the project is provided in the Environmental Statement ("ES") Chapter 4 Description of the Proposed Works (DCO Document Reference 6.7).

1.2 Background to this Strategy and Survey Results

1.2.1 This document provides guidance on mitigation measures to protect reptiles and amphibians (collectively known as herpetofauna) during the construction phase and to provide connective habitat during the operation of the DCO Scheme. These recommendations are made in line with best

[1] WECA has powers in relation to strategic transport, housing and adult skills for Bristol City Council ("BCC"), Bath and North East Somerset ("B&NES"), and South Gloucestershire Councils ("SGC"). NSDC is not part of WECA but works closely with WECA.

practice guidance on herpetofauna mitigation and habitat management and have been discussed and agreed with NR and NSDC.

1.2.2 All species of reptile in the UK are protected under Schedule 5 of the UK Wildlife and Countryside Act ("WCA") 1981 (as amended). The relatively widespread reptile species: such as viviparous lizard *Zootoca vivipara*, slow worm *Anguis fragilis*, grass snake *Natrix natrix* and adder *Vipera berus* are protected against intentional killing, injuring or selling. The rarer species, sand lizard *Lacerta agilis* and smooth snake *Coronella austriaca,* are also fully protected under the WCA 1981 (as amended) and receive additional protection under the Conservation of Habitats and Species Regulations 2017 (as amended) (the "Habitats Regulations"). Amphibians are partially protected by the WCA. Great crested newts are fully protected by the WCA and are listed on Schedule 2 of the Habitats Regulations as a European Protected Species. Great crested newt and common toad *Bufo bufo* are Species of Principal Importance under the Natural Environment and Rural Communities Act 2006 ("NERC Act 2006"). Details of surveys for great crested newts and other amphibians are presented in Appendix 9.4 (DCO Document Reference 6.25) and ES Chapter 9 Ecology and Biodiversity (DCO Document Reference 6.12). Waterbody locations are shown on ES Volume 3 Book of Figures, Figure 9.4 (DCO Document Reference 6.24).

1.2.3 There are records of widespread reptile species within 500 metres of the DCO Scheme centreline (including grass snake, slow worm and viviparous lizard). Much of the study area provides valuable habitat for reptiles in the form of rough/unmanaged grassland with scrub, hedgerows, ditches and open areas for basking both within and adjacent to the works area. Reptile surveys undertaken in 2015 and 2016 showed that slow worms are present along the entire length of the disused line (Portishead to Pill), and much of the Portbury freight line. Particularly high numbers of slow worms were recorded in the vicinity of Station Road, Portbury on the disused line and the proposed area for Pill Station on the freight line. Grass snakes are widespread across the disused line and were occasionally found along the operational freight line. Areas of suitable habitat within the DCO Scheme are identified in Figure 1.

1.2.4 Amphibian surveys undertaken between 2014 and 2018 found that great crested newt, common frog, common toad, palmate newts and smooth newts are widespread across the DCO Scheme footprint, on the disused line and Portbury freight line between Pill and Ham Green. A registered toad crossing is active on the National Cycle Network route 41 ("NCN41") between the M5 and the village of Pill alongside the DCO Scheme and other toad patrols are set up in the wider area, e.g. one centred on Fennel Road, Portishead, which is close to Portishead Ecology Park[2].

1.2.5 Records of toads from these migration routes collected by the Portishead and Pill Toad Patrols, obtained from Froglife in 2020, show that between about 500 and 1,000 toads were collected over the migration season in six survey years and averaging 670 from roads centred on Fennel Road, Portishead. In ten survey years between 36 and 1766 toads were collected

[2] www.froglife.org

from NCN41 west of Pill, with an average of about 840 toads, excluding the low count in 2010 (Table 2, Annex A).

1.2.6 Toad surveys were undertaken at Lodway Farm at Pill, Ham Green and Portishead in late February and early March 2021 to obtain more information on the breeding population and how the toads use the disused line and area of the proposed site compounds. Survey results are shown in Table 1, Annex A of this report and are summarised below.

Portishead - surveys concluded that the disused line does not form part of the toads' migration route to their breeding ponds. As the known breeding ponds are on either side of the disused line (at the Portishead Ecology Park and Gallingale Way) this was expected. However, toads are likely to be using parts of the disused line and surrounding vegetation as part of their wider terrestrial habitat.

Ham Green - surveys found a small number of toads on Chapel Pill Lane. Toads are known to breed within Ham Green Lakes, although no signs were observed from the western side of the lakes during the 2021 surveys. It is likely that toads are breeding in a different part of the lakes and possibly using more suitable habitat on the eastern and northern sides. No toads were found within the proposed Pill Tunnel Eastern Portal compound area during the surveys, although individuals would be expected to occur within any vegetated areas.

Lodway Farm and surrounds - Toads were found along NCN41 west of Pill and within the breeding pond located between the disused railway, the railway spur into Royal Portbury Dock and the M5. A few individuals were observed on the disused line confirming that this area forms part of the toads' habitat and route to the breeding pond (pond 32 shown in Figure 9.4 of the ES, DCO Document Reference 6.24). Whilst only a few individuals were observed within Lodway Farm, it is likely that the proposed Lodway construction compound provides terrestrial habitat for a number of toads that then cross over the disused line to access the breeding pond.

Survey limitations

- the full extent of the pond 32 could not be surveyed due to health and safety restrictions therefore numbers may not reflect the true population
- the peak migration was interrupted by a drop in temperature
- access to the eastern end of the disused line where it converges towards the spur from the port was limited due to health and safety restrictions relating to the nearby freight line, and
- thorough surveys of the proposed Lodway construction compound were severely limited due to the dense grass, which made it difficult to observe toads.

1.2.7 Physical damage to, loss of or change to habitats during the construction phase has the potential to harm herpetofauna. Any area of habitat that is unmanaged or only occasionally managed has the potential to support herpetofauna, so care is required when clearing areas during advance works and construction. Once the DCO Scheme is operational, impacts on reptiles are considered to be minimal, and retained and replanted habitat on

the scheme boundaries will provide suitable, connective herpetofauna habitat. Operational impacts on toads crossing the railway between Lodway Farm and NCN41 west of Pill require mitigation through design to assist toad movement across the rails.

1.2.8 Proposed mitigation within these areas is summarised as follows:

- Displacement by habitat manipulation and destructive search where enough suitable habitat outside of the working areas remain on the disused line.
- Displacement by habitat manipulation on the Portbury Freight Line.
- Trapping and relocation where displacement is unlikely to be successful due to lack of suitable habitat outside of the working area, or where high numbers of reptiles are likely to be captured.
- Toolbox talks will be given to site and construction staff by the Ecological Clerk of Works (“EcCoW”).
- The contractor will consider measures to limit construction vehicle movements after dusk during peak toad migration times and peak return time at known toad crossing areas.
- Mitigation by scheme design including retaining vegetation, new planting and construction of hibernacula.
- Site specific mitigation for toads at the proposed Lodway construction compound.
- Mitigation for toads on the railway between the M5 and Portbury Junction near Lodway Farm, to assist toad movement across the railway once operational.

1.2.9 Due to the differences in habitat and construction works proposed, this report is divided into the following sections for displacement and trapping:

- Section 2 Displacement on the disused line;
- Section 3 Displacement on the freight line; and
- Section 4 Trapping reptiles on disused line and Portbury Freight line.

SECTION 2

Displacement on the disused line

2.1 Location of reptiles and amphibians

2.1.1 Habitat manipulation should be undertaken in areas that provide herpetofauna habitat where any construction activities (including access tracks/haul roads) are planned on the disused line, as identified in Figure 1. The aim of habitat manipulation is to render the area unsuitable for herpetofauna, encouraging individuals to move away from areas where they may be injured or killed during construction, and to displace them towards adjacent areas of suitable habitat.

2.2 Habitat manipulation on the disused line

2.2.1 Habitat manipulation should be undertaken via a programme of strimming or raised flail mowing of herbaceous vegetation. This should be undertaken in stages, successively reducing the height and reducing the area of vegetation to displace any herpetofauna present.

2.2.2 Phased cutting should be undertaken over several days, as species such as slow worms are unlikely to vacate an area quickly. Once vegetation is removed to ground level the vegetation height should be maintained at levels <10 cm to ensure the habitat remains unsuitable for herpetofauna until construction activities have been completed. Frequent cutting of these areas will be required to maintain the necessary conditions. Alternatively, the cut areas can be scraped to remove roots of vegetation and thus reduce re-growth.

2.2.3 The recommended approach to habitat manipulation is set out below.

- Day 1: During dry, warm weather in the active season for herpetofauna (April to end of September), the vegetation should be cut using strimmers to a height not exceeding 30 cm where possible. Vegetation should be cut directionally, working towards the nearby habitat to be retained that could be used for the dispersal of herpetofauna.
- Day 2: Prior to the second cut an ecologist should walk through the area, towards the direction of the retained vegetation to disturb any herpetofauna. Then as day 1, during dry, warm weather, the vegetation should be cut using strimmers to a height not exceeding 10 cm where possible. Vegetation will also be cut directionally as per Day 1.
- Vegetation must be maintained at a height not exceeding 10 cm throughout the construction period. To achieve this, it is recommended that vegetation is cut to a height of approximately 5 cm approximately once every two weeks. However, during the spring and summer months when the rate of growth increases further cuts may be necessary.

- Cut vegetation should be raked up and taken off site. There is potential to use suitable material (such as grass) to create potential egg laying sites for grass snakes, and logs and brash for hibernacula either within the receptor site or in other areas identified for artificial hibernacula within the scheme design.

2.3 Destructive search following displacement on the disused line

2.3.1 A Master Construction Environmental Management Plan ("CEMP") has been prepared for the DCO Scheme, which sets out the measures to be undertaken during construction to manage environmental impacts (see ES Appendix 4.2, DCO Document Reference 8.14). The CEMP specifies that all construction staff shall receive a toolbox talk as part of site induction, supported by further training for example through toolbox talks, information posters and weekly talks, which explains the importance of the site to herpetofauna and their legal status. All staff should remain vigilant for the presence of herpetofauna and ensure that any encountered during construction are moved to safety in consultation with the ecologist. A suitably experienced ECoW must oversee the works and be present on site whenever required, at the ECoW's discretion, and until the initial ground clearance is completed.

2.3.2 A destructive search will be undertaken, overseen by an ecologist, in all areas where habitat manipulation has occurred on the disused line and construction site compound areas, immediately prior to the commencement of construction activities. A destructive search involves searching areas by hand and removing any remains of strimmings, leaf litter, rubble piles or other remaining debris. The top layer of soil within the work area would then be stripped to a depth of 10 cm. During this process, the ecologist will dismantle these habitat features and translocate any reptiles captured to the nearest receptor site (Figure 1). Amphibians will be translocated to suitable retained habitat within 1 km of the captured animal (to avoid the need for disease screening for chytrid fungus, which can affect amphibian populations). If toads are collected, the location of the release site will have regard for the time of year and likely migration route that the toads would have undertaken.

2.3.3 Any herpetofauna caught during the habitat manipulation or destructive search will be placed into a suitable container such as a lidded bucket with air holes, for transport to the closest receptor or release site. On-site advice/guidance would be provided by the ECoW.

2.4 Timing of displacement and destructive search

2.4.1 In areas where herpetofauna hibernacula are likely to be present, vegetation clearance should be undertaken during the spring and summer months (April to end of September) when herpetofauna are active. This is to avoid having to look after the herpetofauna during the hibernation period and placing them in retained habitat the following spring.

2.4.2 Displacement through habitat manipulation should be completed a minimum of two weeks before works affecting that area commence. The destructive search would then be undertaken immediately prior to commencement of

the main construction work. The habitat must remain unsuitable for herpetofauna between habitat manipulation and the destructive search to avoid recolonisation. Any herpetofauna found during the destructive search will be safely captured and moved to the nearest receptor or release site.

SECTION 3

Displacement on the freight line

3.1 Location of reptiles

3.1.1 Four areas on the freight line have been identified as having reptile populations present following reptile surveys, as shown on Figure 1. The areas are as follows.

- Clifton Bridge Tunnel No. 2 north portal.
- Clifton Bridge Tunnel No. 1 north and south portal
- North of A370 Brunel Way overbridge (adjacent to Allotments, around the disused platforms of Ashton Gate).
- North and South of Barons Close.

3.2 Habitat manipulation on the freight line

3.2.1 Construction works should, where feasible, be programmed within the reptile active season (April to end of September) in the four areas identified. Construction works outside this period are not advised, because in suitable habitat reptiles may be hibernating and any works could result in the death of these animals,

3.2.2 In the reptile active season habitat manipulation as detailed in Section 2.2 should be completed a minimum of 2 weeks before construction works commence. If ground works cannot be undertaken within the reptile active season, habitat manipulation must be undertaken within the active season and the ground maintained as unsuitable for reptiles until works commence.

3.2.3 Note that rare plants have been identified on the cess of the freight line within the Avon Gorge, and advice regarding the treatment of plants should be sought from the ECoW prior to habitat manipulation.

3.3 Destructive search on the freight line

3.3.1 Destructive searches within the Avon Gorge (for Clifton Bridge Tunnels No. 1 and No. 2) will not be possible by conventional construction plant due to limited access. A destructive search will not be undertaken following habitat manipulation but hand searching, maintenance of low level vegetation and vibration caused by the plant proposed for cess and track renewal with the Avon Gorge is likely to deter any remaining reptiles from the working areas.

3.3.2 Destructive searches will be possible on the freight line in areas outside the Avon Gorge (north of A370 and north and south of Barons Close) as there is available access for suitable plant. A destructive search will be completed within the working areas following recommendations given in Section 2.3.

3.4 Liberty Lane Site Compound

3.4.1 The vegetated areas at the edge of the operational hardstanding within the proposed site at the eastern end of Liberty Lane Site Compound close to the existing railway have been identified as having potential for reptiles to be present (ES Appendix 9.1 target notes, DCO Document Reference 6.25).

Provided that no vegetation is to be disturbed, no further reptile mitigated is required at this site. As a precaution to prevent any injury to reptiles, any vegetation requiring removal should be cleared by habitat manipulation within the reptile active season under an ecological watching brief and the area maintained as unsuitable for reptiles until construction works commence.

SECTION 4

Trapping reptiles and amphibians along the DCO Scheme

4.1 Locations of Trapping Areas

4.1.1 Four areas on the disused line and two areas on or near the Portbury Freight line around Pill have higher populations of reptiles (shown as Trapping Areas 1 to 6 on Figure 1). This, in combination with the lack of retained adjacent habitat requires reptiles to be trapped out and relocated to receptor sites (Figure 1) rather than being displaced by habitat manipulation. Any amphibians collected during the trapping will be translocated to suitable retained habitat within 1 km of the captured animal (to avoid the need for disease screening for chytrid fungus, which can affect amphibian populations). If toads are collected, the location of the release site will have regard for the time of year and likely migration route that the toads would have undertaken. Note where it states a certain number of "suitable days" for reptile trapping, these do not have to be consecutive. Where reptile fencing is required, it must be maintained, with vegetation kept low and left *in situ* for the duration of works. The areas are as follows.

- Trapping Area 1 – Portishead Station Car Park, disused line. The surrounding urban area limits the amount of suitable retained habitat for displacement. A low population of slow worms has been found in this area, and trapping for 60 suitable days with 5 days of non-capture is required. No reptile fencing is required for the majority of the trapping area but reptile fencing will be required for Quays Avenue road realignment if the Harbour Crescent development (planning application 16/P/2066/F) has not been completed. The trapped animals are to be relocated to the Portishead Ecology Park receptor site.
- Trapping Area 2 – Sheepway Bridge (bank and grass strip on embankment on all sides of the bridge), disused line. A low population of slow worms has been found in this area and trapping for 60 suitable days with 5 days of non-capture is required. Reptile fencing is required at the bottom of the road embankments from the start of the trapping programme until the start of construction in this area. Trapped animals are to be relocated to the Portishead Ecology Park receptor site.
- Trapping Area 3 – East of Station Road, disused line. A low population of slow worms and a medium population of grass snakes have been found in this area and trapping for 60 suitable days (slow worms) and 70 suitable days (grass snakes) with 5 days of non-capture is required. Reptile fencing is required around the trapping area. Trapped animals are to be relocated to the Portishead Ecology Park receptor site.
- Trapping Area 4 – Disused line, north of Lodway Farm Construction Compound. A medium population of slow worms and a small population of grass snakes have been found in this area. Trapping for 70 suitable days (slow worms) and 60 suitable days (grass snakes), with 5 days of non-capture is required. Reptile fencing is required around the trapping

area. Trapped animals are to be relocated to the Manor Farm receptor site.

- Trapping Area 5 – Lodway Close to Pill Tunnel western portal, Portbury Freight Line. A low population of grass snakes and a medium population of slow worms have been found in this area and trapping for 60 suitable days (grass snakes) and 70 suitable days (slow worms) with 5 days of non-capture is required. No reptile fencing is required. Trapped animals on the freight line and Mount Pleasant Embankment will be moved to the northern side of the railway alongside Watch House Hill (Figure 1). Trapped animals from Lodway Close to Pill Viaduct (including embankment where ramps to the station platform to be built) to be relocated to Manor Farm Reptile Receptor site (Figure 1).
- Trapping Area 6 – Monmouth Road site compound and Pill Station Car Park. The proposed site compound and car park area has not been surveyed due to access restrictions but it is considered suitable reptile habitat with ruderal and tall grass vegetation, scrub and a low wall. There is limited adjacent suitable habitat for displacement and it is therefore recommended that reptiles are trapped from this area (assume suitable 60 days of trapping with 5 days of non-capture). Trapped animals to be relocated to Manor Farm Receptor site (Figure 1).

4.2 Trapping

4.2.1 Trapping reptiles is to be undertaken when reptiles are active (April to end of September). The most successful time for capturing reptiles is generally between late April and late June, and again between late August and late September, when temperatures are not too high and reptiles are likely to be using refugia. A high density of reptile refugia (roofing felt and tins) will be used and placed in suitable habitat within the areas to be trapped out. The refugia will be checked for a minimum of 60 or 70 suitable days (as detailed above), and herpetofauna found beneath the refugia placed temporarily into a suitable container such as a lidded bucket with air holes, for transportation to the receptor or release site. Unsuitable days will be those with heavy rain or excessive heat when reptiles are unlikely to be using refugia. A period of 5 days of non-capture shall be completed at the end of the trapping period to be sure that trapping effort is adequate.

4.2.2 Habitat manipulation is usually advised to enhance capture methods. This involves reducing the amount of suitable vegetation cover to make reptiles easier to catch. Strimming or brush cutting scrub and reducing the height of grass as detailed in Section 2.2 may be appropriate. Islands of taller rank vegetation can be left, where remaining reptiles are likely to be concentrated.

4.3 Destructive search following trapping

4.3.1 A destructive search shall be undertaken as detailed in Section 2.3.

4.4 Reptile receptor sites

4.4.1 Two reptile receptor sites have been identified, one at Portishead Ecology Park and one at Manor Farm, Pill as shown on Figure 1. Both have been

surveyed for reptiles and small reptile populations were found, with capacity to absorb larger reptile populations following habitat improvements.

4.4.2 Habitat improvements are required in these areas prior to reptile relocation as described below.

- Portishead Ecology Park. Clearance of scrub on higher ground embankments to create more grassland/basking areas for slow worms and hibernacula in the winter before reptile trapping is programmed. Installation of two hibernacula on the bund near housing to the west of the area can be incorporated within the exisiting management arrangements of the Ecology Park. The Ecology Park is managed by North Somerset Council and is not subject to planning or other threats in the foreseeable future. A plan will be agreed with North Somerset Council's Streets and Open Spaces team to undertake the post-translocation management and monitoring programme for reptiles.
- Manor Farm. Prior to reptile relocation to Manor Farm, a reptile basking bank and four hibernacula are to be installed, sheep grazing removed, and reptile fencing installed on the field boundary between the receptor site and the adjacent fields proposed for a construction site compound. The two land parcels to the west of Lodway Farm are currently dominated by thistles. The extent of thistle cover will be reduced (by pulling out the thistles) prior to translocation to improve the quality of the grassland for reptiles. The area is not subject to planning or other threats in the foreseeable future. A plan will be developed for the post-translocation management and monitoring programme for reptiles.

SECTION 5

Mitigation for reptiles and amphibians during construction

5.1 General measures

5.1.1 The Master CEMP (DCO document reference 8.14) requires habitat manipulation, displacement, trapping and destructive searches during the reptile and amphibian active season (April to September). The methodology for these is described in sections 2-4 of this report.

5.1.2 Potential hibernacula such as wooden sleepers and dead wood habitats are frequent along the disused railway line. The Master CEMP (DCO document reference 8.14) states that existing hibernacula within the construction work footprint will be dismantled and removed outside of the reptile and amphibian hibernation period (October to March inclusive).

5.1.3 The Master CEMP (DCO document reference 8.14) requires the contractor to prepare a detailed CEMP for a Stage or Stages. The contractor will detail how they propose to undertake work on the site whilst protecting sensitive ecological features and will set out the methodology for any required pre-construction ecological surveys, site clearance and reinstatement, licensing obligations, ecological mitigation, site supervision and seasonal restrictions for the works method as stipulated by the ES.The Master CEMP (DCO document reference 8.14) states that “toolbox talks shall be given by the EcCoW when activities have specific risks to ecological receptors. They shall highlight the measures that shall be implemented to protect the ecological sensitivity of the particular feature. They shall also set out any specific measures applicable to any licences or consents”.

5.1.4 Construction site compounds will be reinstated after construction. The Master CEMP (DCO document reference 8.14) states that: “The sites acquired for temporary construction compounds and haul roads will be reinstated to their current state and vacated as early as practicably possible”.

5.2 Site specific mitigation for toads at construction site compounds

5.2.1 The contractor will consider measures to limit construction vehicle movements after dusk during peak toad migration time (usually over two weeks in February/March) and peak return time (particularly for toadlets) which is usually two weeks in early summer at known toad crossing areas (i.e. at Lodway construction compound and disused line between M5 and Pill, along Chapel Pill lane and Fennel Road/Gallingale Way at Portishead. Toad crossings are shown on Figure 9.4 of the ES, DCO Document Reference 6.24).

5.2.2 Site specific mitigation for toads is required at Lodway construction compound .

5.2.3 Records of toads collected by Pill Toad Patrol, obtained from Froglife in 2020, show that in ten survey years (2010-2020) an average of about 840 toads were collected from NCN41 west of Pill. Information provided by Pill Toad Patrol indicate that the breeding pond is pond 32 (NGR ST51779 76360), located to the north of the railway line (Ecology and Biodiversity Figure 9.4, DCO Document Reference 6.24). They report that toads move from the wintering sites, which are primarily the disused railway line, Lodway Farm fields and the back gardens of surrounding houses. Toads migrate in late winter and early spring during mild (temperature 5 or 6°C) and generally wet weather, travelling from their over-wintering sites in dense vegetation, scrub and woodland back to their breeding pond. The peak movement across NCN41 west of Pill usually occurs in the last week of February and the first week of March. However, some initial movement across roads such as The Breaches and Lodway Farm fields could occur days, weeks or even months earlier.

5.2.4 The mitigation for toads at Lodway compound during construction works is as follows:

- Retention of hedgerow habitat where possible.
- Installation of temporary amphibian fencing as shown on Figure 4, overseen by the EcCoW and in discussion with Pill Toad Patrol. Sections of fencing in high volume toad areas (such as habitat adjacent to NCN41 west of Pill) will have pitfall traps.
- Assisting and liaising with Pill Toad Patrol with collection of toads during peak migration time (usually over two weeks in February/March) and peak return time (particularly for toadlets) which is usually two weeks in early summer. Pitfall traps will be checked regularly when open and amphibians collected every evening and morning during peak migration time and taken to the safe release site.
- Restricting construction vehicle movements after dark during peak migration time and peak return time (as detailed above).
- Identify and establish safe release areas containing suitable habitat close to the site compound, identified by the EcCoW.
- Contractor method statements, posters/toolbox talks and briefings to ensure good practice in terms of material storage and making staff aware of toad movements on site, as stated in the Master CEMP (DCO Document Reference 8.14).
- EcCoW to monitor the amphibian fencing and toad movement during the construction phase.
- Rescuing toads from the reptile receptor area (Manor Farm) and adjacent areas that may be trapped by reptile fencing and taking them to a breeding pond at the relevant time. The use of artificial refugia (such as squares of roofing felt) may be required in order locate trapped amphibians within this area.

SECTION 6

Mitigation by scheme design

6.1 Principal design features

6.1.1 Herpetofauna require sufficiently large areas of habitat to support viable populations in the long term. The relatively short distances over which they can disperse mean that they are dependent either on large areas of continuous habitat, or closely-spaced patches, ideally linked by favourable intervening terrain. The periodic movement of individual animals between local populations effectively combines them into a larger metapopulation, increasing effective population size and viability. This is essential to support genetic diversity in the long term, avoiding the ill-effects of inbreeding. It also reduces the risk of populations becoming extinct due to locally catastrophic events, such as fire. Habitat connectivity is important not only at a landscape level, but also within a site.

6.1.2 The scheme design has included the following measures to ensure the habitat is suitable for herpetofauna in the long term.

1. Habitat within Network Rail land outside the vegetation clearance required for construction (which is within 3 to 5 m of the running rail) on the disused line will be retained or replanted post construction. As much habitat as possible will be retained. The habitat to be retained during construction is shown on the Railway Landscaping Plans (disused section) (DCO Document Reference 2.10), and includes trees, scrub, hedgerow, tall grass, ruderals and ephemeral vegetation suitable for herpetofauna. Planting of trees, scrub and hedgerow will be undertaken on the disused line as detailed in the Landscape Plan. This is to maintain the boundary vegetation as suitable habitat for protected species, including herpetofauna.
2. Habitat within Network Rail land outside the 3 to 5 m distance from the running rail on the freight line will be retained, except where removal is required for construction e.g. installation of fences, steps and works to structures during the construction phase. The distance for vegetation clearance within the Avon Gorge Woodlands Special Area of Conservation (“SAC”) will be 3 m due to the potential impacts on the rare habitats and species. During operations, vegetation management in this section is detailed in Network Rail’s draft Site Management Statement (Network Rail 2018).
3. A swale with scrub and long grass has been included in the design for Portishead Station car park along the southern boundary to provide connecting habitats (DCO Document Reference 2.38 - Portishead Station Car Park Layout, Landscaping and New Boulevard and Access Plan).
4. A reptile tunnel has been included underneath the realigned Quays Avenue to connect habitats on either side of the road and reduce fragmentation (DCO Document Reference 2.38 - Portishead Station Car Park Layout, Landscaping and New Boulevard and Access Plan). The tunnel should be at least 500 mm in diameter, although 1 m is preferable (Highways Agency, 2001).

5. Four hibernacula for herpetofauna and one reptile basking bank will be built within the corridor of the new railway along the disused line (see Figures 1, 2 and 3).
6. Scrub and long grass, as detailed in the landscape plan, will be planted between Pill Station car park and the freight line to maintain connectivity (see Pill Station Car Park, and PSP Layout, Landscaping, Lighting and Access Plan DCO Document Reference 2.42). The habitat between the car park and the disused platform on the northern side of the freight line will be retained.
7. One hibernaculum for herpetofauna will be constructed in a suitable area near Barons Close on the freight line (Figure 1).
8. The Master CEMP (see ES Appendix 4.2, DCO Document Reference 8.14) requires drainage designs for the new station car parks to include amphibian-friendly drainage features to avoid entrapment of amphibians.
9. Where possible paladin fencing should have a 100mm gap at the bottom to allow amphibian and reptile movement along suitable habitat (palisade and post and wire are wide enough without the need for additional gaps).
10. The design includes the retention of disused railway platforms where possible due to the importance of this habitat for reptiles. The retained disused platforms are as follows:
    - Old Portbury Station, east of Station Road Bridge, disused line (127mi 79ch – 127mi 71ch);
    - Pill Station northern platform, freight line (126mi 15ch – 126mi 09ch);
    - The old Clifton Bridge station south of the railway overbridge/ access at the bottom of Rownham Hill, freight line (121mi 66ch – 121mi 60ch);
    - The old Ashton Gate station platform located north of the A370 Brunel Way overbridge, freight line (121mi 31ch); and
    - Where parts of the platform, such as the coping stones, require removal this will need to be undertaken in the presence of a suitably experienced ecologist.

6.2 Design for reptile/amphibian hibernacula

6.2.1 Installation of artificial hibernacula has been agreed with Network Rail and North Somerset Council at locations shown on Figure 1. Hibernacula are not only used by herpetofauna to hibernate over the winter months but also throughout the year for shelter and basking. On free draining land, the hibernaculum would be incorporated into a shallow pit (Figure 2). This design is more likely to remain frost-free, and will be less obtrusive and thus unlikely to be subject to interference. The key design features of an artificial hibernaculum are as follows (Highways Agency, 2005).

- Located within a sunny position in areas as shown on Figure 1.
- Sited on a well-drained area that is not prone to flooding.
- Orientated so that one of the long banks faces south.

- Access for reptiles through openings or gaps rather than pipes.
- Located within an area of habitat favourable suitable for reptiles and/ or suitable for dispersal to nearby suitable habitat e.g. within grassland.
- Should be subjected to minimal public disturbance.
- Be at least 1000 mm long (and 500 mm below ground on free-draining land).

6.2.2 These features are usually constructed by removing the turf from the footprint of the hibernacula and digging a shallow pit into which a mixture of inert material is placed (see Figure 2). This material can include logs, brash, inert hard core, bricks and grubbed-up tree roots, although it is important not to place materials that will decompose beneath more robust materials like bricks or hardcore due to the risk of collapse. Some of this material should be left slightly exposed to create openings that provide access for reptiles. The removed turf should then be placed on top of the feature to provide some covering of vegetation and protection from frost. Scrub and other dense vegetation should be encouraged in patches around the hibernacula to provide immediate cover for reptiles using the feature. On impermeable land, the hibernacula should be built above ground using the design shown in Figure 2.

6.2.3 The reptile basking bank (Figure 3) will be constructed from stones, logs, soil and turf and is an artificial bank for reptiles to bask on and seek shelter whilst gaining solar heat.

6.2.4 The above habitat enhancements should be undertaken alongside, or immediately after construction works are finished.

6.3 Mitigation to facilitate toads crossing the railway

6.3.1 Great crested newts and other amphibians are also known to use and move across railway ballast. However, research has found that railways can cause amphibian mortality and that most dead individuals (77%) were adult common toads. The research suggests that railway mortality depends on the agility of the species, associated primarily with the ability to overcome the rails (Budzik et al, 2014). Network Rail (“NR”) has confirmed that they do not have any information on toad mortalities on railways.

6.3.2 NR has confirmed that, for operational reasons, there should be no gaps or openings between the bottom of the rail and the ballast, which toads might be able to use to get across the rails. NR has confirmed that gaps can appear as the ballast and track position changes, but this would then be rectified through maintenance. Therefore mitigation for toads on the railway between the M5 and Portbury Junction at Pill (NGR ST 51537623 to ST 52017627) is required to assist toad movement across the railway once operational. The affected section where mitigation is required is approximately 500 m in length and follows the location of the registered toad patrol along NCN41 between the M5 and Pill.

6.3.3 NR has confirmed that they have no examples from across the country of infrastructure used to assist toads to cross an operational railway and are looking at examples from Europe. Suitably designed infrastructure to guide toads under the rails is being considered by Network Rail. Any feasible

solution must be suitable to allow safe passage for toads and not pose a risk to the safe operation of the railway.

6.3.4 One proposed design entails the use of concrete hollow sleepers, which are normally used as under track crossings (UTX) for cables (plate 1). These would be installed without the cables. The gap in the sleeper is 150mm high and 250mm wide, which is considered to be suitable for toad movement. NR is considering the design further to investigate whether measures can be incorporated to encourage toads to enter the hollow sleeper when following the rail above and measures to prevent ballast blocking the entrance. The frequency of installation of the concrete hollow sleepers is being considered by NR and may be between every 20-50 m depending on rail safety requirements. This would lead to between 10 and 25 sleepers being installed.

Plate 1. Concrete hollow sleepers

6.3.5 Other designs may be used and are currently being considered by NR. The preferred design will be confirmed once the research and feasibility studies are complete and will be installed

6.3.6 The infrastructure and migration will be monitored using camera traps and visual inspections during the toad migration season following the railway opening. All monitoring shall be undertaken in accordance with the required Health and Safety standards associated with an operational railway line. As this is a novel design in the UK, the design and monitoring results will provide useful information to inform other projects.

6.3.7 Fencing installed between the M5 and Portbury Junction, Pill must maintain a gap (ideally of 100mm) to allow migrating toads to pass underneath.

SECTION 7

Operation of the DCO Scheme

7.1.1 Once the scheme is operational, impacts to reptiles are considered to be minimal, and retained and replanted habitat on the scheme boundaries will provide adequate suitable, connective reptile habitat. Standard clearance of overhanging vegetation as part of Network Rail's regular maintenance on the disused line will be beneficial to reptiles as it will create open areas with a mosaic of boundary habitats.

7.1.2 Network Rail has confirmed that the hibernacula and reptile basking bank will be identified on their Hazards Directory which will ensure that they are not disturbed in the future e.g. by maintenance or herbicide spraying.

7.1.3 Once the DCO Scheme is operational, impacts to amphibians are considered to be minimal, and retained and replanted habitat on the scheme boundary will provide adequate suitable, connective amphibian habitat. The only exceptions, where impacts need to be mitigated, are the toad migration routes at Pill. The mitigation for the migration at Pill will be monitored following the railway opening to assess the efficacy of the design. Monitoring will involve the use of camera traps and visual inspections.

SECTION 8

Conclusions

8.1.1 Mitigation is proposed for herpetofauna which involves displacement by habitat manipulation, trapping and relocation where displacement is unlikely to be successful and destructive searches.

8.1.2 Generic mitigation measures have been included in the Master CEMP (see ES Appendix 4.2, DCO Document Reference 8.14) to avoid impacts on herpetofauna. The relevant mitigation measures are replicated in this report.

8.1.3 Toad surveys in February and March 2021 confirmed toads crossing the disused line between the M5 and Portbury Junction in Pill and their presence within the proposed Lodway construction compound.

8.1.4 Site specific mitigation measures are proposed during the construction period for Lodway compound where toads are known to migrate.

8.1.5 The contractor will consider measures to limit construction vehicle movements after dusk during peak toad migration time and peak return time at known toad crossing areas (i.e. at Lodway construction compound and disused line between M5 and Pill, along Chapel Pill Lane and Fennel Road/Gallingale Way at Portishead. Toad crossings are shown on Figure 9.4 of the ES, DCO Document Reference 6.24).

8.1.6 Mitigation has been incorporated into the scheme design such as amphibian friendly drainage features for the new station car parks. Mitigation is required to assist toads to migrate across the operational railway between the M5 and Portbury Junction in Pill. NR is currently considering the design of the infrastructure and the preferred design will be confirmed once the research and feasibility studies are complete. Following installation of the preferred design, it will be monitored for the first migration season.

SECTION 9

References

Amphibian and Reptile Conservation (2009). Common toads and roads, guidance for planners and highways engineers (England).

CH2M. (2016). Portishead Branch Line DCO Scheme (MetroWest Phase 1) Reptile Survey Report. North Somerset District Council

Budzik et al (2014). A preliminary report of amphibian mortality patterns on railways. *Acta Herpetologica* 9(1): 103-107.

Edgar, P., Foster, J. and Baker, J. (2010). Reptile Habitat Management Handbook. Amphibian and Reptile Conservation, Bournemouth.

English Nature (2004) Reptiles: Guidelines for Developers. English Nature, Peterborough.

Froglife (1999) Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation - Froglife Advice Sheet 10, Froglife.

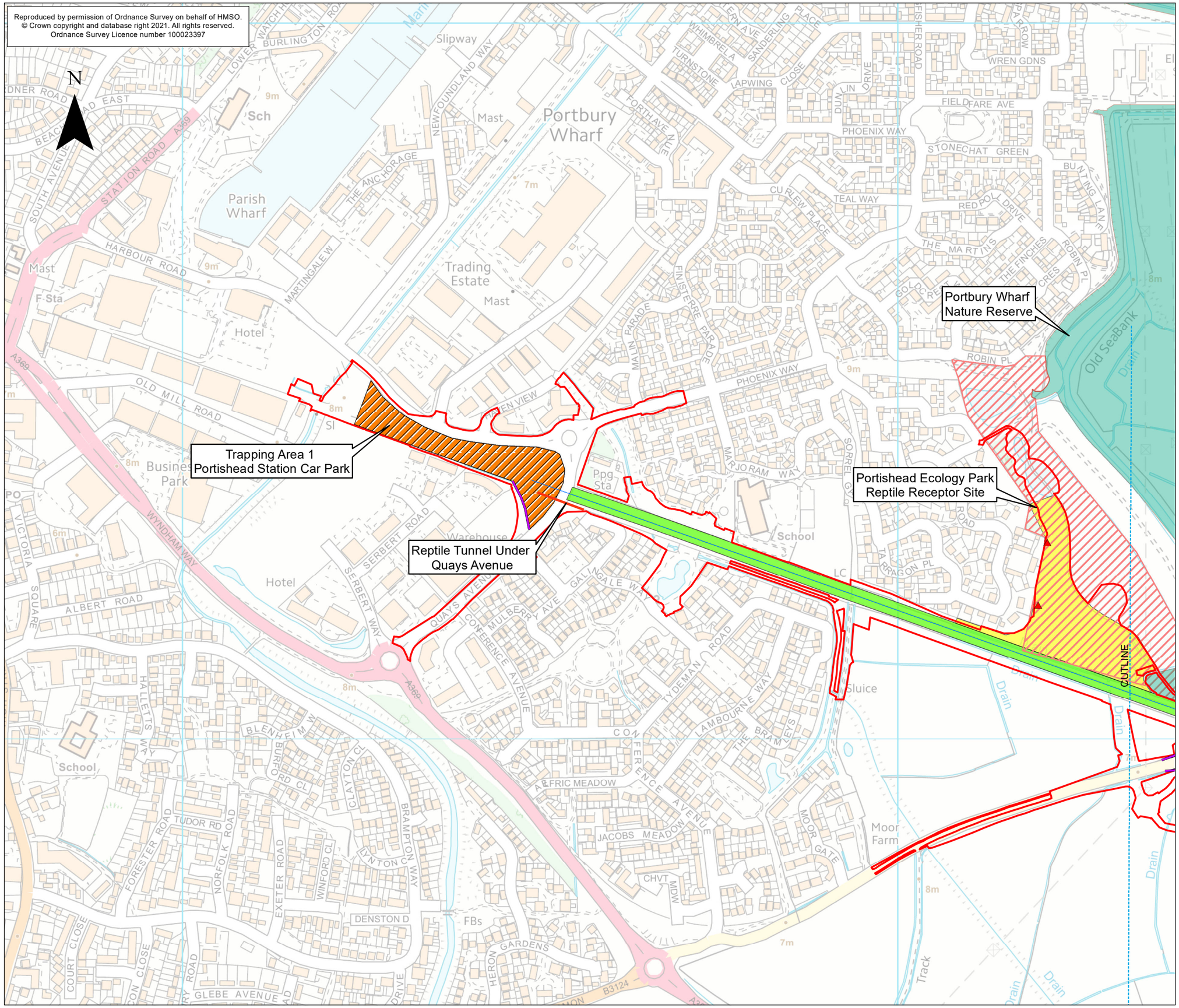
Gent T and Gibson S (2003) Herpetofauna Workers' Manual, JNCC, Peterborough.

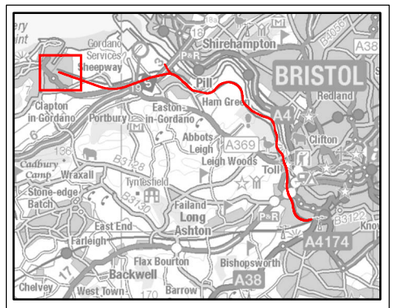
Highways Agency. (2005). Nature Conservation Advice In Relation To Reptiles and Roads. Design Manual for Roads and Bridges. Volume 10 Environmental Design And Management, Section 4, part 7.

Highways Agency (2001). Nature Conservation Management Advice in Relation to Amphibians, Design Manual for Roads and Bridges. Volume 10 Environmental Design and Management, Section 4, Part 6.

Network Rail (2018). Avon Gorge SSSI and SAC. Site Management Statement for Network Rail from 30.03.2018 until 30.03.2018

Figures





KEY

- Order Limits

Portishead Branch Line

- The Nationally Significant Infrastructure Project (NSIP) Works
- Hibernacula
- Reptile Tunnel
- Reptile Fence
- Displacement Areas
- Portishead Ecology Park
- Portishead Ecology Park Reptile Receptor Site
- Portbury Wharf Nature Reserve
- Trapping Areas

0 100 200
Metres

Rev	By	Chkd	Apprvd	Date	Description
ES-C	MPC	CW	CF	10/03/2021	Revised Order Limits
ES-B	JG	CW	CF	18/09/2020	Second draft
ES-A	JG	CW	CF	16/10/2019	First draft

Client

travelwest
Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

CH2M HILL
Geospatial
Burderop Park, Swindon, SN4 0QD
Tel: +44 (0)1793 812479 Fax: +44 (0)1793 812089
www.ch2m.com

Project :
Portishead Branch Line
(MetroWest Phase 1)

Drawing :
Figure 1: Reptile Mitigation
Sheet 1 of 11 - Portishead
APFP Regulation 5(2)(a)

Drawn By :	Martin Costello	Date: 10/03/2021
Checked By :	Clare Williams	Date: 10/03/2021
Approved By :	Carolyn Francis	Date: 10/03/2021

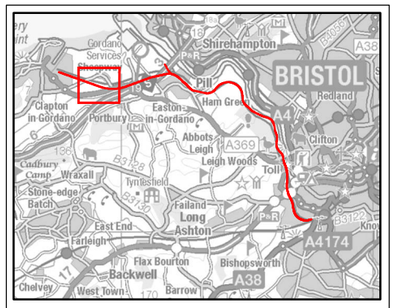
Drawing No. : 674946 -001-001-A
Revision ES-C

Drawing Scale : 1:5,000 @ A3

Document Path: \\gblon0vs01\swindon\SWIN-FS-06\Projects\Consulting\we\Environmental_Assessment\Projects\MetroWest Phase 1\GIS\MXDs\Ecology\Wildlife_Sites\Figure1_Reptile_Mitigation_v4.mxd

Trapping Area 2
Sheepway Bridge
Embankments

Trapping Area 3
East of Station Road



KEY

- Order Limits

Portishead Branch Line

- The Nationally Significant Infrastructure Project (NSIP) Works
- Hibernacula
- Basking Bank
- Reptile Fence
- Displacement Areas
- Portishead Ecology Park
- Portishead Ecology Park Reptile Receptor Site
- Portbury Wharf Nature Reserve
- Trapping Areas

0 100 200
Metres

Rev	By	Chkd	Apprvd	Date	Description
ES-C	MPC	CW	CF	10/03/2021	Revised Order Limits
ES-B	JG	CW	CF	18/09/2020	Second draft
ES-A	JG	CW	CF	16/10/2019	First draft

Client

travelwest
Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

CH2M HILL
Geospatial
Burderop Park, Swindon, SN4 0QD
Tel: +44 (0)1793 812479 Fax: +44 (0)1793 812089
www.ch2m.com

Project :
Portishead Branch Line
(MetroWest Phase 1)

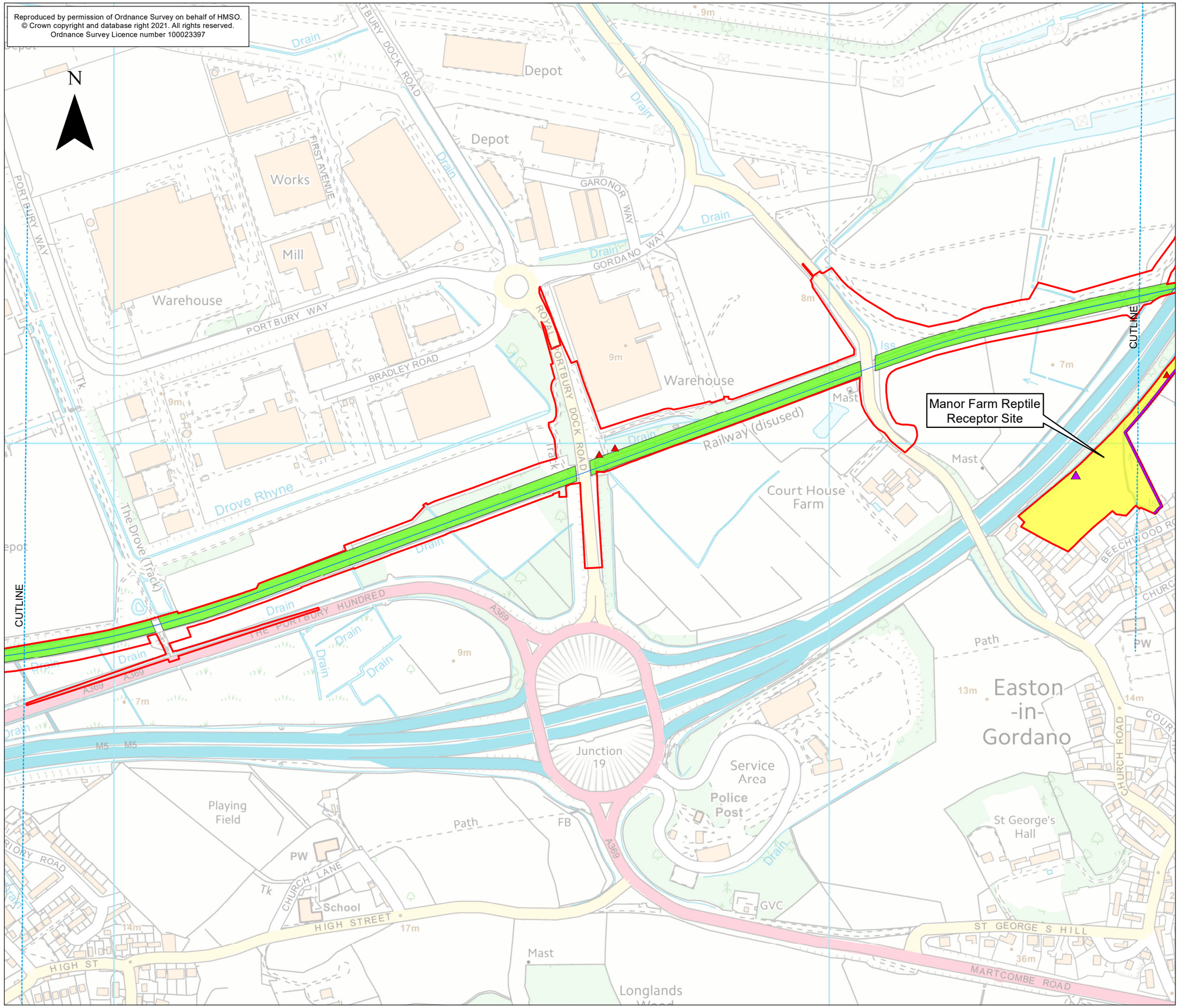
Drawing :
Figure 1: Reptile Mitigation
Sheet 2 of 11 - Sheepway
APFP Regulation 5(2)(a)

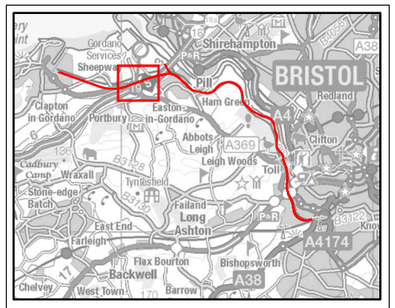
Drawn By :	Martin Costello	Date: 10/03/2021
Checked By :	Clare Williams	Date: 10/03/2021
Approved By :	Carolyn Francis	Date: 10/03/2021

Drawing No. : 674946 -001-001-A
Revision ES-C

Drawing Scale : 1:5,000 @ A3

Document Path: \\gblon0vs01\swindon\SWIN-FS-06\Projects\Consulting\we\Environmental_Assessment\Projects\MetroWest Phase 1\GIS\MXDs\Ecology\Wildlife_Sites\Figure1_Reptile_Mitigation_v4.mxd





KEY

- Order Limits

Portishead Branch Line

- The Nationally Significant Infrastructure Project (NSIP) Works
- Hibernacula
- Basking Bank
- Reptile Fence
- Displacement Areas
- Manor Farm Reptile Receptor Site

0 100 200
Metres

Rev	By	Chkd	Apprvd	Date	Description
ES-C	MPC	CW	CF	10/03/2021	Revised Order Limits
ES-B	JG	CW	CF	18/09/2020	Second draft
ES-A	JG	CW	CF	16/10/2019	First draft

Client

travelwest
Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

CH2M HILL
Geospatial
Burderop Park, Swindon, SN4 0QD
Tel: +44 (0)1793 812479 Fax: +44 (0)1793 812089
www.ch2m.com

Project :
Portishead Branch Line
(MetroWest Phase 1)

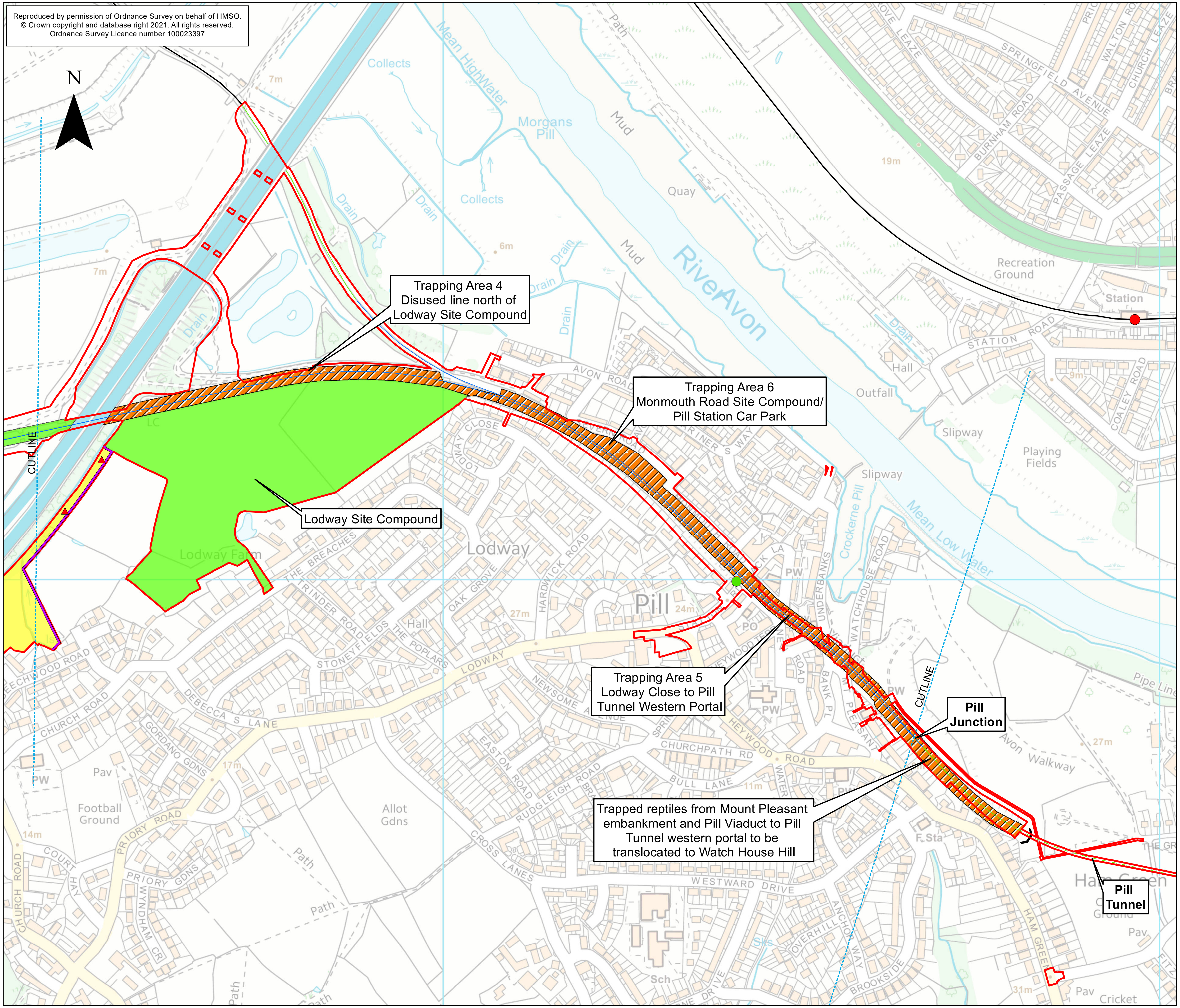
Drawing :
Figure 1: Reptile Mitigation
Sheet 3 of 11 - Junction 19
APFP Regulation 5(2)(a)

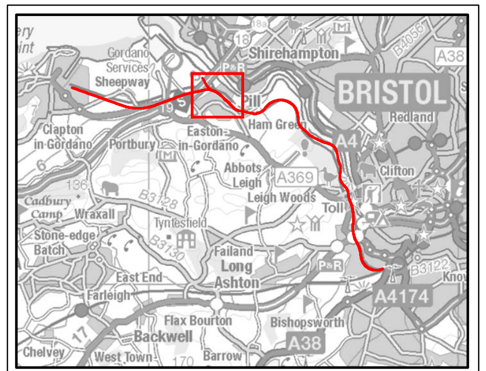
Drawn By :	Martin Costello	Date: 10/03/2021
Checked By :	Clare Williams	Date: 10/03/2021
Approved By :	Carolyn Francis	Date: 10/03/2021

Drawing No. : 674946 -001-001-A
Revision : ES-C

Drawing Scale : 1:5,000 @ A3

Document Path: \\gblon0vs01\swindon\SWIN-FS-06\Projects\Consulting\we\Environmental_Assessment\Projects\MetroWest Phase 1\GIS\MXDs\Ecology\Wildlife_Sites\Figure1_Reptile_Mitigation_v4.mxd





KEY

Order Limits

Portishead Branch Line

The Nationally Significant Infrastructure Project (NSIP) Works

The Associated Development

Section in Tunnel

Railway Line

Existing Railway Line

Railway Tunnel

Existing Railway Station

Pill Railway Station

Hibernacula

Reptile Fence

Displacement

Manor Farm Reptile Receptor Site

Trapping Areas

0 100 200

Metres

Rev	By	Chkd	Apprvd	Date	Description
ES-C	MPC	CW	CF	10/03/2021	Revised Order Limits
ES-B	JG	CW	CF	18/09/2020	Second draft
ES-A	JG	CW	CF	16/10/2019	First draft

Client

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

CH2M HILL
Geospatial
Burderop Park, Swindon, SN4 0QD
Tel: +44 (0)1793 812479 Fax: +44 (0)1793 812089
www.ch2m.com

ch2m

Project : Portishead Branch Line (MetroWest Phase 1)

Drawing : Figure 1: Reptile Mitigation Sheet 4 of 11 - Pill *APFP Regulation 5(2)(a)*

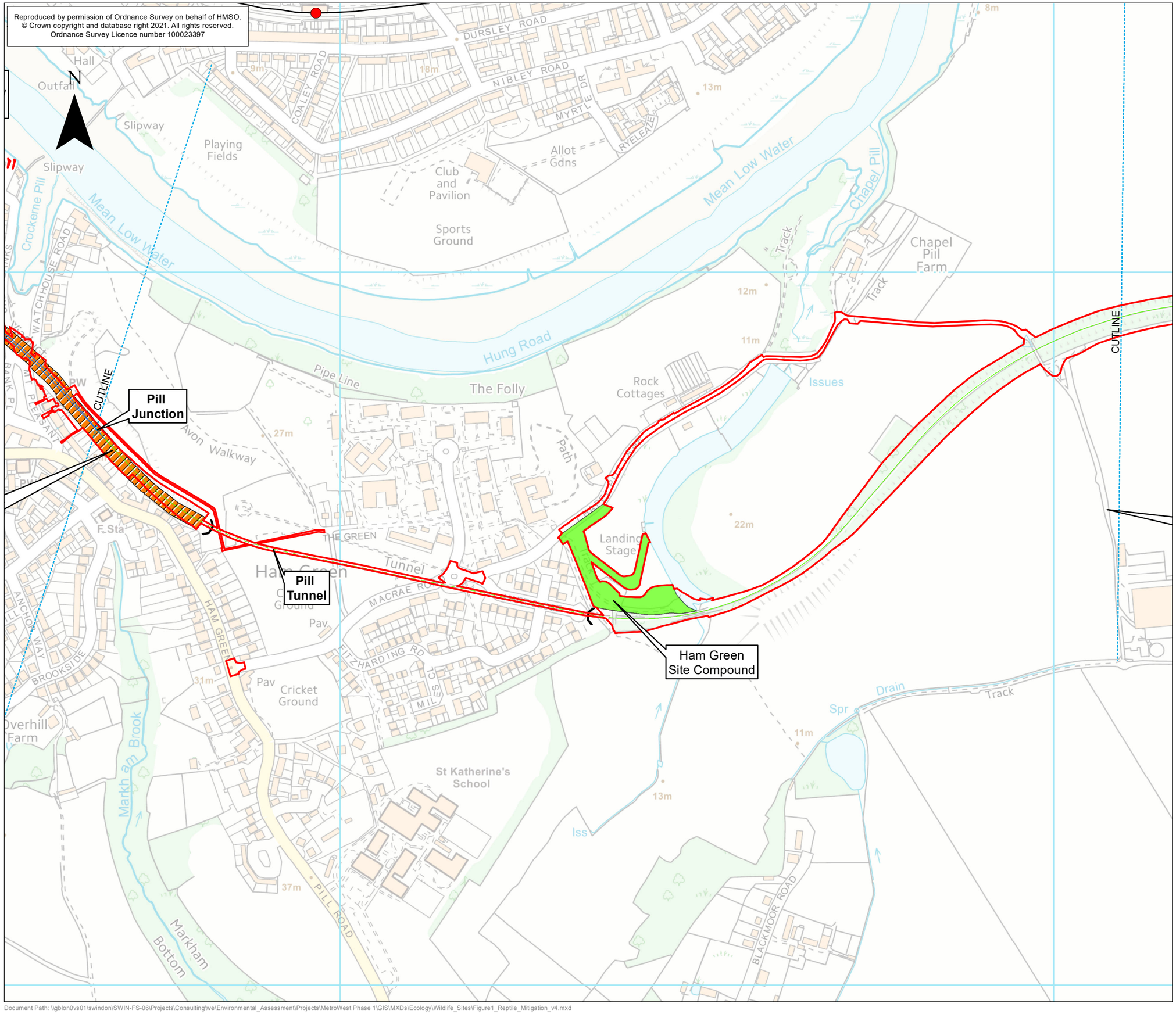
Drawn By :	Martin Costello	Date: 10/03/2021
Checked By :	Clare Williams	Date: 10/03/2021
Approved By :	Carolyn Francis	Date: 10/03/2021

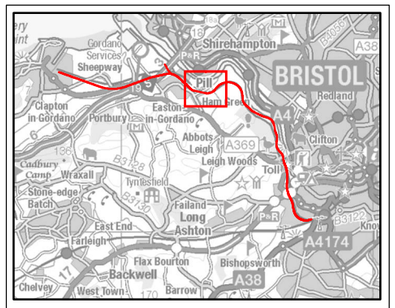
Drawing No. : 674946 -001-001-A

Revision: ES-C

Drawing Scale : 1:5,000 @ A3

Document Path: \\gblon0vs01\swindon\SWIN-FS-06\Projects\Consulting\we\Environmental_Assessment\Projects\MetroWest Phase 1\GIS\MXDs\Ecology\Wildlife_Sites\Figure1_Reptile_Mitigation_v4.mxd





KEY

- Order Limits

Portishead Branch Line

- The Nationally Significant Infrastructure Project (NSIP) Works
- The Associated Development Works
- Section in Tunnel

Railway Line

- Existing Railway Line
- Railway Tunnel
- Existing Railway Station
- Displacement Areas
- Trapping Areas

0 100 200
Metres

Rev	By	Chkd	Apprvd	Date	Description
ES-C	MPC	CW	CF	10/03/2021	Revised Order Limits
ES-B	JG	CW	CF	18/09/2020	Second draft
ES-A	JG	CW	CF	16/10/2019	First draft

Client

travelwest
Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

CH2M HILL
Geospatial
Burderop Park, Swindon, SN4 0QD
Tel: +44 (0)1793 812479 Fax: +44 (0)1793 812089
www.ch2m.com

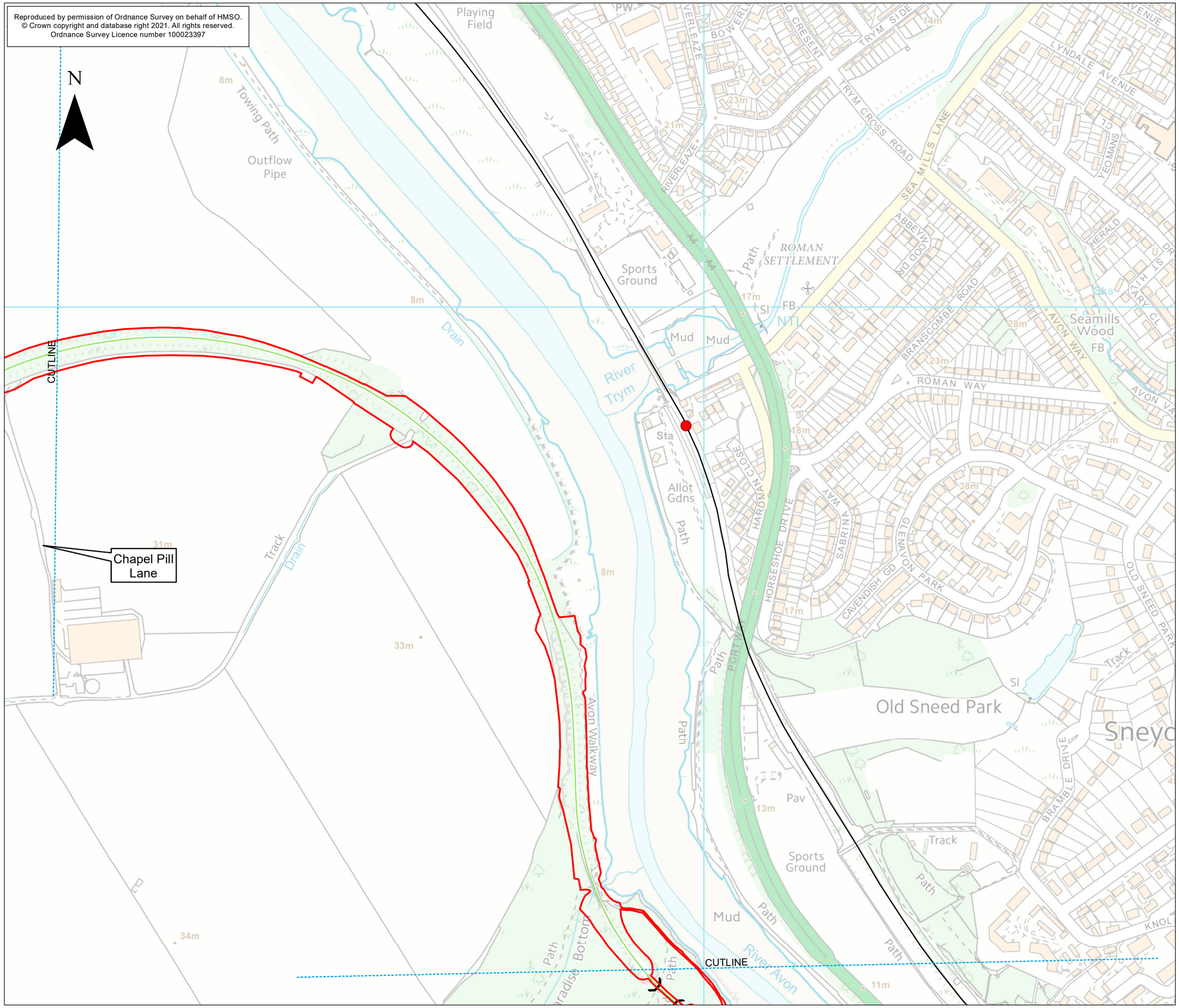
Project :
Portishead Branch Line (MetroWest Phase 1)

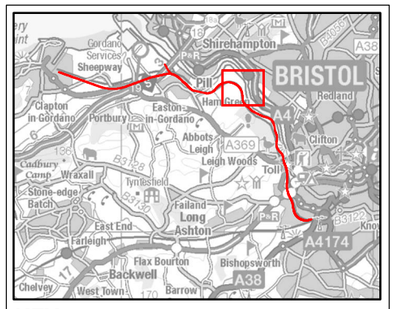
Drawing :
Figure 1: Reptile Mitigation
Sheet 5 of 11 - Ham Green
APFP Regulation 5(2)(a)

Drawn By :	Martin Costello	Date: 10/03/2021
Checked By :	Clare Williams	Date: 10/03/2021
Approved By :	Carolyn Francis	Date: 10/03/2021

Drawing No. : 674946 -001-001-A
Revision ES-C

Drawing Scale : 1:5,000 @ A3





KEY

- Order Limits

Portishead Branch Line

- The Associated Development Works

Railway Line

- Existing Railway Line
- Railway Tunnel
- Existing Railway Station

0 100 200
Metres

Rev	By	Chkd	Apprvd	Date	Description
ES-C	MPC	CW	CF	10/03/2021	Revised Order Limits
ES-B	JG	CW	CF	18/09/2020	Second draft
ES-A	JG	CW	CF	16/10/2019	First draft

Client

travelwest
Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

CH2M HILL
Geospatial
Burderop Park, Swindon, SN4 0QD
Tel: +44 (0)1793 812479 Fax: +44 (0)1793 812089
www.ch2m.com

Project :
Portishead Branch Line
(MetroWest Phase 1)

Drawing :
Figure 1: Reptile Mitigation
Sheet 6 of 11 - Chapel Pill
APFP Regulation 5(2)(a)

Drawn By :	Martin Costello	Date: 10/03/2021
Checked By :	Clare Williams	Date: 10/03/2021
Approved By :	Carolyn Francis	Date: 10/03/2021

Drawing No. : 674946 -001-001-A
Revision ES-C

Drawing Scale : 1:5,000 @ A3

Document Path: \\gblon0vs01\swindon\SWIN-FS-06\Projects\Consulting\we\Environmental_Assessment\Projects\MetroWest Phase 1\GIS\MXDs\Ecology\Wildlife_Sites\Figure1_Reptile_Mitigation_v4.mxd

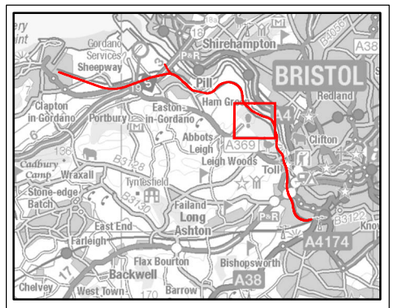
N

Sandstone Tunnel

CUTLINE

Leigh Woods

CUTLINE



KEY

- Order Limits

Portishead Branch Line

- The Associated Development Works

Railway Line

- Existing Railway Line
- Railway Tunnel
- Displacement Areas

0 100 200

Metres

Rev	By	Chkd	Apprvd	Date	Description
ES-C	MPC	CW	CF	10/03/2021	Revised Order Limits
ES-B	JG	CW	CF	18/09/2020	Second draft
ES-A	JG	CW	CF	16/10/2019	First draft

Client

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

CH2M HILL
Geospatial
Burderop Park, Swindon, SN4 0QD
Tel: +44 (0)1793 812479 Fax: +44 (0)1793 812089
www.ch2m.com

Project :

Portishead Branch Line
(MetroWest Phase 1)

Drawing :

Figure 1: Reptile Mitigation
Sheet 7 of 11 - Leigh Woods (1)
APFP Regulation 5(2)(a)

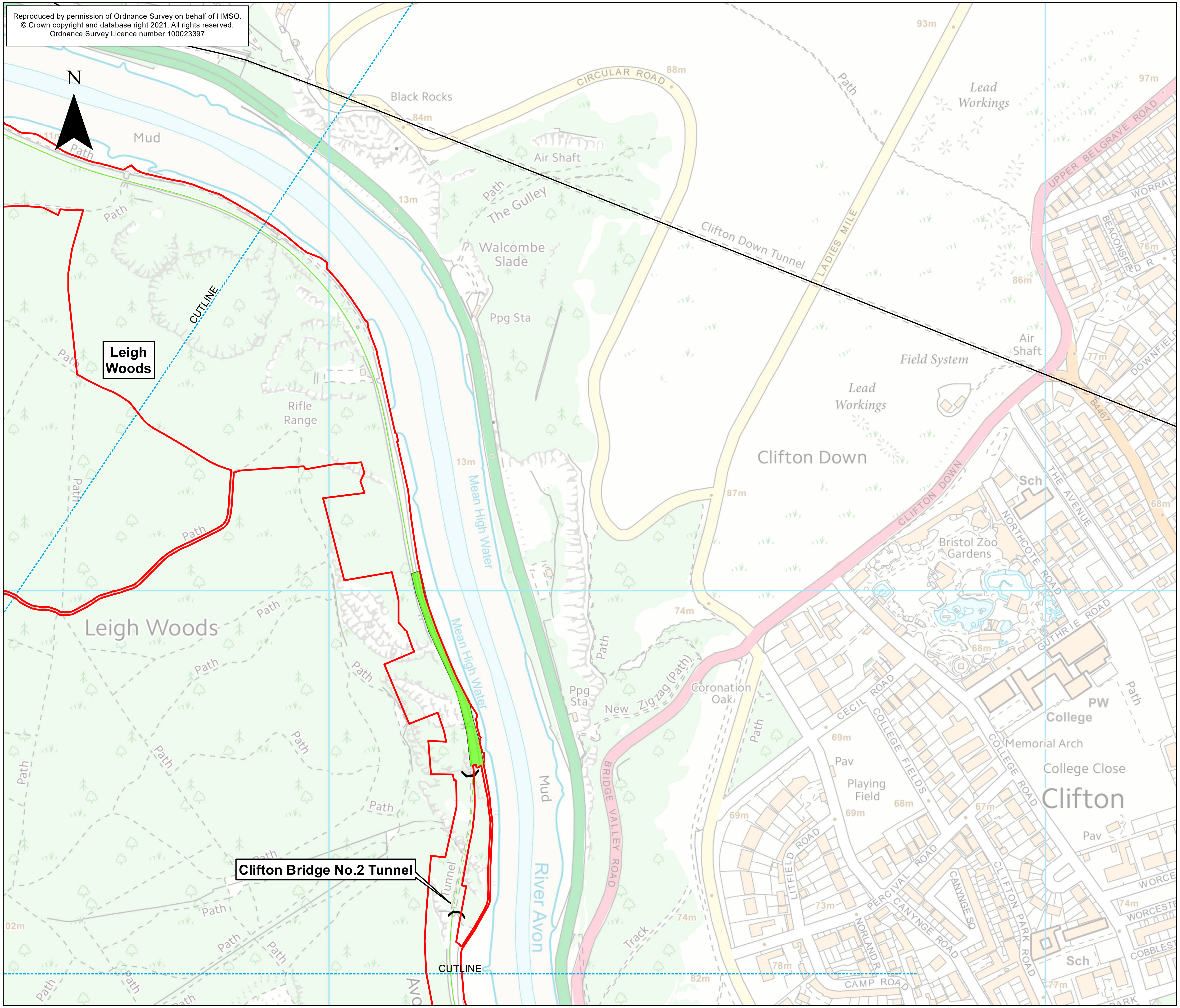
Drawn By :	Martin Costello	Date: 10/03/2021
Checked By :	Clare Williams	Date: 10/03/2021
Approved By :	Carolyn Francis	Date: 10/03/2021

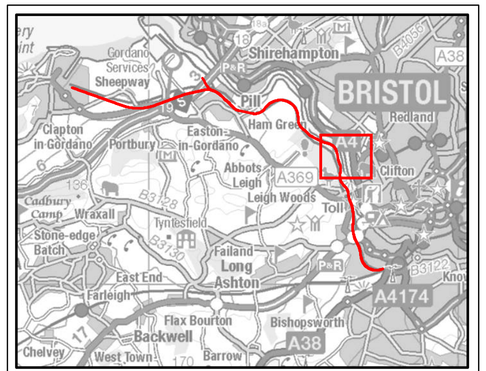
Drawing No. : 674946 -001-001-A

Revision ES-C

Drawing Scale : 1:5,000 @ A3

Document Path: \\gblon0vs01\swindon\SWIN-FS-06\Projects\Consulting\we\Environmental_Assessment\Projects\MetroWest Phase 1\GIS\MXDs\Ecology\Wildlife_Sites\Figure1_Reptile_Mitigation_v4.mxd





KEY

Order Limits

Portishead Branch Line

The Associated Development Works

Section in Tunnel

Railway Line

Existing Railway Line

Railway Tunnel

Displacement Areas

0 100 200
Metres

Rev	By	Chkd	Apprvd	Date	Description
ES-C	MPC	CW	CF	10/03/2021	Revised Order Limits
ES-B	JG	CW	CF	18/09/2020	Second draft
ES-A	JG	CW	CF	16/10/2019	First draft

Client

travelwest
Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

CH2M HILL
Geospatial
Burderop Park, Swindon, SN4 0QD
Tel: +44 (0)1793 812479 Fax: +44 (0)1793 812089
www.ch2m.com

Project : Portishead Branch Line (MetroWest Phase 1)

Drawing : Figure 1: Reptile Mitigation
Sheet 8 of 11 - Leigh Woods (2)
APFP Regulation 5(2)(a)

Drawn By : Martin Costello Date: 10/03/2021
Checked By : Clare Williams Date: 10/03/2021
Approved By : Carolyn Francis Date: 10/03/2021

Drawing No. : 674946 -001-001-A
Revision: ES-C

Drawing Scale : 1:5,000 @ A3

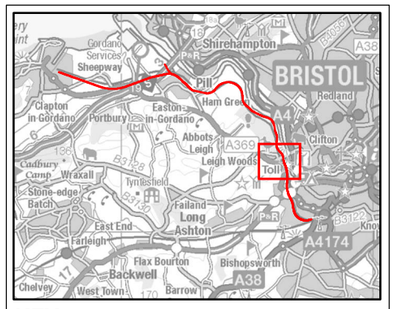
Document Path: \\gblon0vs01\swindon\SWIN-FS-06\Projects\Consulting\we\Environmental_Assessment\Projects\MetroWest Phase 1\GIS\MXDs\Ecology\Wildlife_Sites\Figure1_Reptile_Mitigation_v4.mxd

CUTLINE

Clifton Bridge No.1 Tunnel

Rownham Hill

CUTLINE



KEY

- Order Limits

Portishead Branch Line

- The Associated Development Works
- Section in Tunnel
- Railway Tunnel
- Displacement Areas

0 100 200

Metres

Rev	By	Chkd	Apprvd	Date	Description
ES-C	MPC	CW	CF	10/03/2021	Revised Order Limits
ES-B	JG	CW	CF	18/09/2020	Second draft
ES-A	JG	CW	CF	16/10/2019	First draft

Client

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

CH2M HILL
Geospatial
Burderop Park, Swindon, SN4 0QD
Tel: +44 (0)1793 812479 Fax: +44 (0)1793 812089
www.ch2m.com

Project :

Portishead Branch Line
(MetroWest Phase 1)

Drawing :

Figure 1: Reptile Mitigation
Sheet 9 of 11 - Leigh Woods (3)
APFP Regulation 5(2)(a)

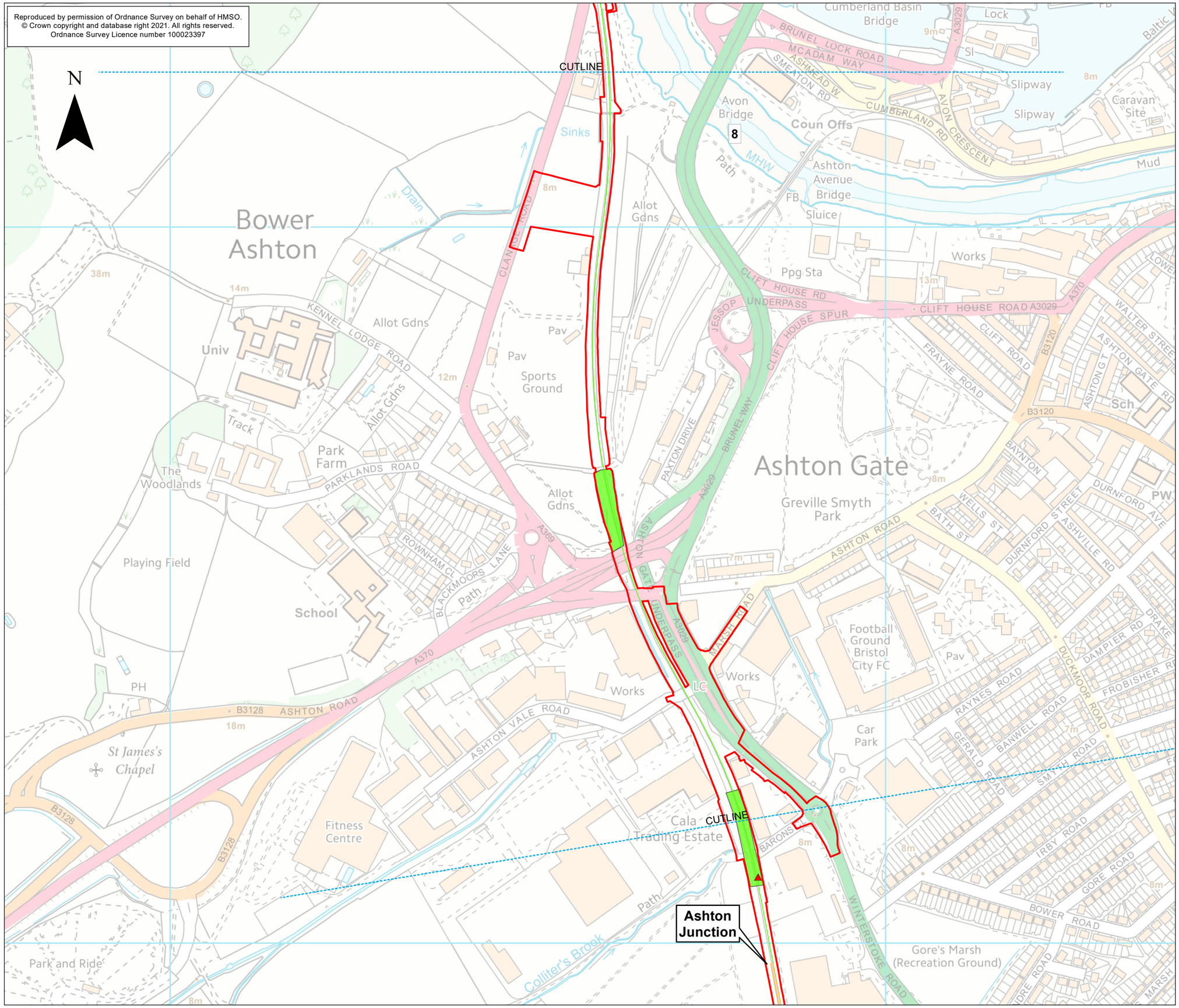
Drawn By :	Martin Costello	Date: 10/03/2021
Checked By :	Clare Williams	Date: 10/03/2021
Approved By :	Carolyn Francis	Date: 10/03/2021

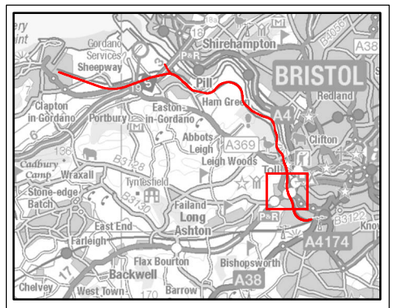
Drawing No. : 674946 -001-001-A

Revision ES-C

Drawing Scale : 1:5,000 @ A3

Document Path: \\gblon0vs01\swindon\SWIN-FS-06\Projects\Consulting\we\Environmental_Assessment\Projects\MetroWest Phase 1\GIS\MXDs\Ecology\Wildlife_Sites\Figure1_Reptile_Mitigation_v4.mxd





KEY

- Order Limits

Portishead Branch Line

- The Associated Development Works

Other Works

- Network Rail Permitted Development Rights
- Hibernacula
- Displacement Areas

0 100 200
Metres

Rev	By	Chkd	Apprvd	Date	Description
ES-C	MPC	CW	CF	10/03/2021	Revised Order Limits
ES-B	JG	CW	CF	18/09/2020	Second draft
ES-A	JG	CW	CF	16/10/2019	First draft

Client

travelwest
Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

CH2M HILL
Geospatial
Burderop Park, Swindon, SN4 0QD
Tel: +44 (0)1793 812479 Fax: +44 (0)1793 812089
www.ch2m.com

Project :
Portishead Branch Line
(MetroWest Phase 1)

Drawing :
Figure 1: Reptile Mitigation
Sheet 10 of 11 - Ashton Gate
APFP Regulation 5(2)(a)

Drawn By :	Martin Costello	Date: 10/03/2021
Checked By :	Clare Williams	Date: 10/03/2021
Approved By :	Carolyn Francis	Date: 10/03/2021

Drawing No. : 674946 -001-001-A
Revision ES-C

Drawing Scale : 1:5,000 @ A3

Document Path: \\gblon0vs01\swindon\SWIN-FS-06\Projects\Consulting\we\Environmental_Assessment\Projects\MetroWest Phase 1\GIS\MXDs\Ecology\Wildlife_Sites\Figure1_Reptile_Mitigation_v4.mxd

N

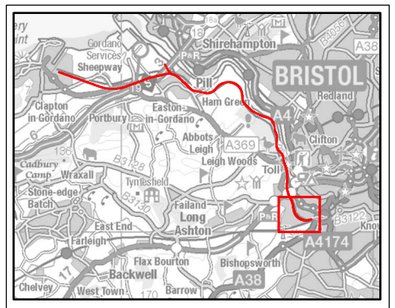
Ashton Junction

Parson Street Station

Parson Street Junction

Liberty Lane Site Compound

CUTLINE



KEY

- Order Limits

Portishead Branch Line

- The Associated Development

Other Works

- Network Rail Permitted Development Rights

Railway Line

- Existing Railway Line
- Existing Railway Station
- Hibernacula
- Displacement Areas

0 100 200

Metres

ES-C	MPC	CW	CF	10/03/2021	Revised Order Limits
ES-B	JG	CW	CF	18/09/2020	Second draft
ES-A	JG	CW	CF	16/10/2019	First draft
Rev	By	Chkd	Apprvd	Date	Description

Client

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

CH2M HILL
Geospatial
Burderop Park, Swindon, SN4 0QD
Tel: +44 (0)1793 812479 Fax: +44 (0)1793 812089
www.ch2m.com

Project :

Portishead Branch Line (MetroWest Phase 1)

Drawing :

Figure 1: Reptile Mitigation
Sheet 11 of 11 - Ashton Junction
APFP Regulation 5(2)(a)

Drawn By :	Martin Costello	Date: 10/03/2021
Checked By :	Clare Williams	Date: 10/03/2021
Approved By :	Carolyn Francis	Date: 10/03/2021

Drawing No. : 674946 -001-001-A

Revision ES-C

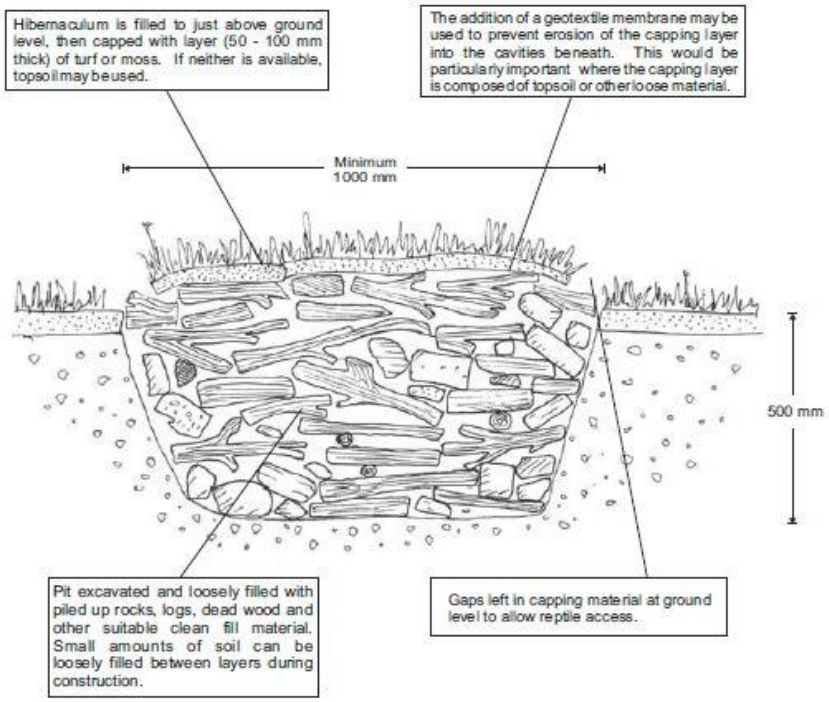
Drawing Scale : 1:5,000 @ A3

Document Path: \\gblon0vs01\swindon\SWIN-FS-06\Projects\Consulting\we\Environmental_Assessment\Projects\MetroWest Phase 1\GIS\MXDs\Ecology\Wildlife_Sites\Figure1_Reptile_Mitigation_v4.mxd

Figure 2: Design of artificial hibernacula on free draining and impermeable land

Hibernaculum on free-draining ground

Where ground conditions allow, the hibernaculum should be incorporated into a shallow pit. This design is more likely to remain frost-free, and will be less obtrusive and thus unlikely to be subject to interference.



Hibernaculum on impermeable ground

Where ground conditions are impermeable, then an 'above-ground' or mounded design should be utilised in order to prevent the hibernaculum from flooding. This design should also be used if it is not possible to excavate a pit for any other reason.

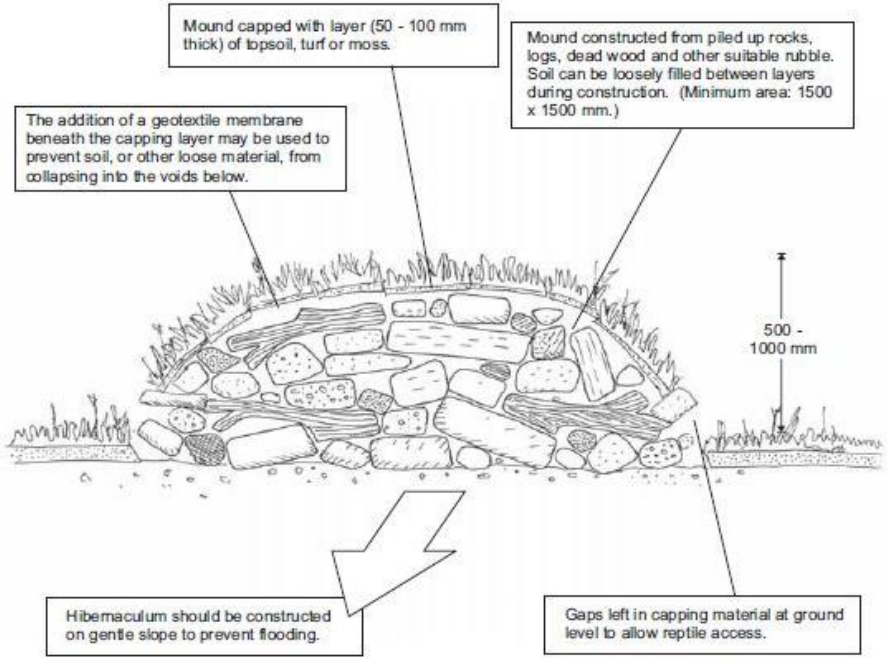
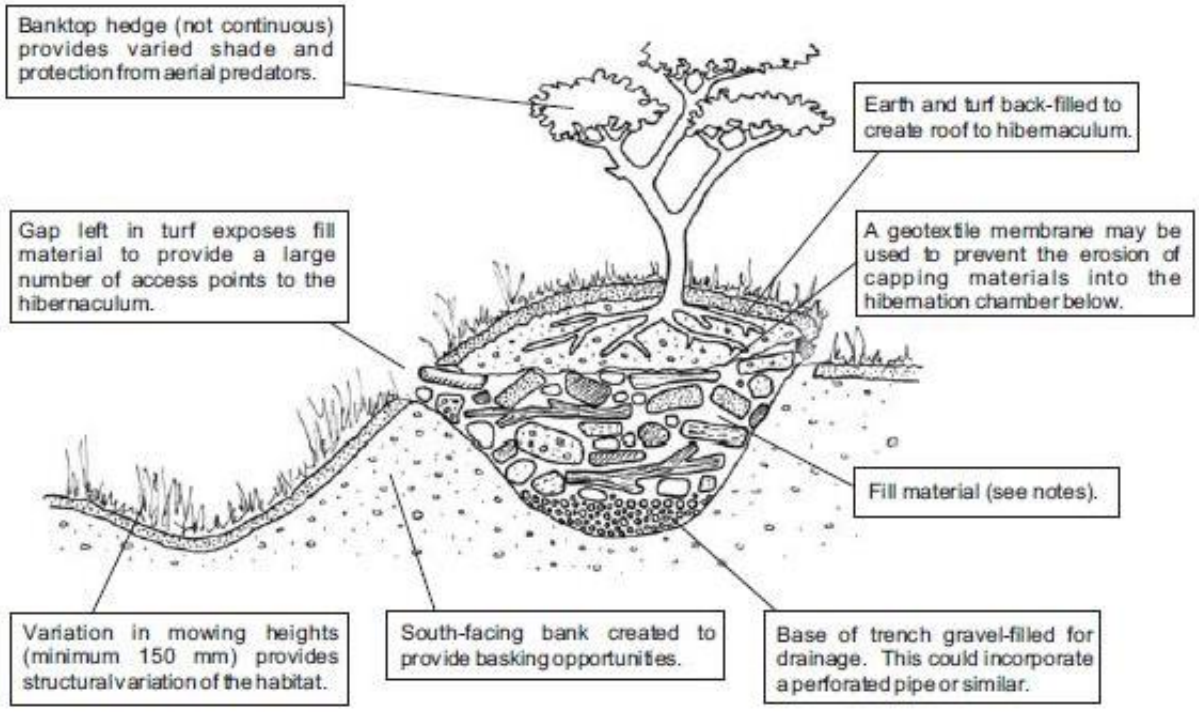


Figure 3: Design of artificial hibernacula on free draining and impermeable land

Complex hibernaculum design

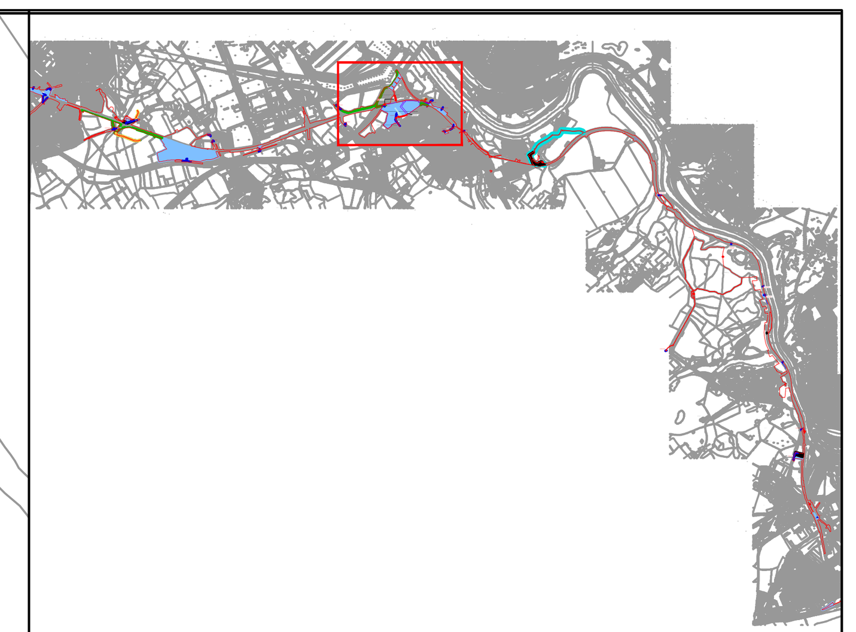
Where particularly large or important populations of reptiles (particularly snakes) occur, it may be appropriate to include a more complex habitat feature as an artificial hibernaculum. One such design is shown below. It incorporates a hibernaculum designed to produce a range of temperatures and humidity gradients during the winter to allow animals to move between their optimum conditions; south-facing basking slopes to provide good quality conditions for animals before and after hibernation, and a range of vegetation heights providing a mosaic of areas of varying habitat structure.



0 10 20 30 40 50 60 70 80 90 100

SCALE 1:1250 (A1) METRES

SCALE 1:2500 (A3)



KEY:

- Order Limits
- Construction Compound
- Haul Road
- Access Point
- Amphibian Fence
- Archaeological Site to be Protected
- Pit fall traps

NOTES:

1) All Amphibian fencing requires 1m clearance to hedgerows.
2) Amphibian fencing requires protection from accidental damage by construction vehicles by the use of herras or other fencing.
3) Amphibian fencing and location of pitfall traps may be subject to change following results of survey data and location/type of security fencing

Rev	By	Chkd	Apprvd	Date	Description
ES-A	OHP	CW/GH	CF	02/05/2021	First Issue

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

CH2M HILL
1 The Square Temple Quay Bristol BS1 6DG
Tel +44 (0)117 910 2580 Fax +44 (0)117 910 2581
www.ch2m.com

Project

Portishead Branch Line (Metrowest Phase 1)

Drawing

Figure 4: Amphibian Exclusion Fencing Plan - Lodway APFP Regulation 5(2)(a)

Drawn by: Ollie Hopkins-Phillips Date: 05/02/2021

Checked by: Clare Williams/Gemma Harding Date: 05/02/2021

Approved by: Carolyn Francis Date: 05/02/2021

Drawing No. 674946.BQ.42.01-SK380

Revision ES-A

Drawing Scale: 1:1250 @ A1 or 1:2500 @ A3

Drawing file path & name : \\brsfpp01\Proj\Consulting\Projects\674946 NSC - 2016 Bristol Framework\674946.BQ.42 MW PM support Nov 16 to Mar 17\dlv 90 AutoCAD DCO drawings only\81 AutoCAD\674946.BQ.42.01-SK380 Rev 0.dwg

Annex A Toad Survey Results

Table 1. Summary of Toad Survey Results for February and March 2021

Site Location	Date	Conditions	Terrestrial Toads	Toads in Pond / Activity
Portishead	22/02/21	7ºc, dry with light breeze	1 female 1 dead toad	Portishead Ecology Park Pond: 3 individuals Gallingale Way pond: 10 individuals
Portishead	02/03/21	5ºc, no wind.	None	None
Portishead	11/03/21	6ºc, dry, light wind	None	None
Ham Green	22/02/21	7ºc, dry with light breeze	2 females on road	Ham Green Lakes x 1 individual
Ham Green	02/03/21	5ºc, no wind.	None	None
Ham Green	11/03/21	6ºc, dry, light wind	None	Ham Green Lakes x 1 individual
Pill	23/02/21	8ºc, very windy, dry	On NCN41 or habitat surrounding pond 32: 57 males 3 females 2 amplexus pairs	Pond 32: 20 males and 2 breeding pairs
Pill	24/02/21	10ºc, windy, overcast	On NCN41 or habitat surrounding pond 32: 22 males 6 females 2 amplexus pairs	Pond 32: 1 breeding pair
Pill	01/03/21	4ºc, light wind	On NCN41 or habitat surrounding pond 32: 2 males	None
Pill	03/03/21	6ºc, light wind	On NCN41 or habitat surrounding pond 32: 6 males 5 females 3 amplexus pairs	Pond 32: 10 individuals
Pill	09/03/21	6ºc, dry, light wind	On NCN41 or habitat surrounding pond 32: 2 males	None
Pill	10/03/21	11ºc, wet, windy	On NCN41 or habitat surrounding pond 32: 15 females (3 on disused line) 40 males 1 amplexus pair	Pond 32: 38 individuals 2 breeding pairs
Pill	15/03/21	7ºc, dry, light wind	None	None

Table 2. Toad Patrol Data from Froglife

Year	Toads Helped	Dead Count
Fennel Road Toad Patrol, Portishead		
2014	644	
2016	525	12
2017	1015	68
2018	546	60
2019	615	55
2020	679	39
NCN41 west of Pill Toad Patrol		
2010	36	3
2011	490	9
2012	905	16
2013	1766	9
2014	449	7
2015	1270	27
2016	695	18
2017	677	-
2018	282	4
2020	1046	6

MetroWest

Portishead Branch Line (MetroWest Phase 1)

TR040011

Applicant: North Somerset District Council
6.25, Environmental Statement, Volume 4, Appendix 9.14 Lodway Farm Hedgerow Survey
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, regulation 5(2)(a)
Planning Act 2008

Author: CH2M

Table of Contents

Acronyms and Abbreviations

BAP	Biodiversity Action Plan
BRERC	Bristol Regional Environmental Records Centre
CIEEM	Chartered Institute of Ecology and Environmental Management
DCO	Development Consent Order
ES	Environmental Statement
MAGIC	Multi-Agency Geographic Information for the Countryside website
NERC Act	Natural Environment and Rural Communities Act
NPPF	National Planning Policy Framework
NSBAP	North Somerset Biodiversity Action Plan
NSIP	Nationally Significant Infrastructure Project
NSDC	North Somerset District Council
RLP	Replacement Local Plan
SPD	Supplementary Planning Document
WCA	Wildlife and Countryside Act

SECTION 1

Introduction

1.1 Background to the DCO Scheme

1.1.1 North Somerset District Council ("NSDC") is making an application for a development consent order ("DCO") to construct the Portishead Branch Line under the Planning Act 2008. The DCO Scheme will provide an hourly (or hourly plus) railway service between Portishead and Bristol Temple Meads, with stops at Portishead, Pill, Parson Street and Bedminster.

1.1.2 The scheme is one of several projects that form part of MetroWest, a programme of rail improvements in the West of England. MetroWest Phase 1 is being led jointly by NSDC and the West of England Combined Authority ("WECA")[2], as a third party promoted rail project, funded by the authorities and devolved funding sources from central government. The West of England Authorities are working with Network Rail, Great Western Railway and the wider rail industry to deliver the MetroWest Programme.

1.1.3 The Portishead Branch Line was built in the 1860s. Passenger services continued between Portishead and Bristol until 1964, and freight services continued to 1981. The Royal Portbury Dock opened in 1978 and in 2002 the currently operational part of the former Portishead Branch Line was re-opened to service the port for freight only. The owner of the Royal Portbury Dock, Bristol Port Company, has commercial rights to run up to 20 freight trains per day in each direction along the operational railway line. The current volume of freight trains operating is substantially less than this. The section of the railway between Portishead and Pill remains disused.

1.1.4 The DCO Scheme comprises the nationally significant infrastructure project ("NSIP") as defined by the Planning Act 2008 to construct a new railway between Portishead and the village of Pill, and associated works including a new station and car park at Portishead, a refurbished station and new car park at Pill and various works along the existing operational railway line between Pill and Ashton Junction where the scheme will join the existing railway. Ashton Junction is located close to the railway junction with the Bristol to Exeter Mainline at Parson Street.

1.1.5 Further information on the project is provided in the Environmental Statement ("ES") Chapter 4 Description of the Proposed Works (DCO Document Reference 6.7).

1.2 Hedgerow Survey

1.2.1 Due to potential works required for an access route for the exportation of old ballast from the railway into Lodway compound and the importation of new ballast to the site, there is potential for two hedgerows within Lodway Farm to be impacted by the proposed works. The location of the hedgerows are

[2] WECA has powers in relation to strategic transport, housing and adult skills for Bristol City Council ("BCC"), Bath and North East Somerset ("B&NES"), and South Gloucestershire Councils ("SGC"). NSDC is not part of WECA but works closely with WECA.

shown in Figure 1. These hedgerows have been identified as having potential to qualify as Important under the Hedgerow Regulations 1997.

1.3 Purpose and Structure of this Report

1.3.1 The purpose of this report is to present the results of a survey of two hedgerows at Lodway Farm.

1.3.2 The report is structured as follows.

- Section 2 - Methods. This section summarises the methods used for undertaking the data collection.
- Section 3 - Legislation. This section sets out the considerations made while undertaking the hedgerow survey.
- Section 4 - Results. This section describes the findings of the survey.
- Section 5 - Conclusion. This section sets out the importance of the features identified and gives an overall conclusion from the hedgerow surveys.

SECTION 2

Methods

2.1 Study area

2.1.1 The study area are field boundaries between Lodway Farm and a disused branch of the Portishead railway line at Easton-in-Gordano. The study area is shown in Figure 1.

2.2 Desk Study

2.2.1 The following sources were consulted to inform the assessment of hedgerows:

- Bristol Regional Environmental Records Centre ("BRERC") for statutorily protected sites, records of species protected under the Wildlife and Countryside Act 1981 (as amended) and red data book species;
- Aerial photographs (https://earth.google.co.uk) and current and historical Ordnance Survey maps for evidence of the age of hedgerows and if any are likely to constitute an historic parish or township boundary;
- Consultation with the Archaeologist at NSDC for advice on the heritage value of the hedgerows.

2.3 Field Survey

2.3.1 The field survey was undertaken on July 5th, 2018. The hedgerows were surveyed against the criteria set out in the Hedgerow Regulations 1997. Details of these criteria are provided in Annex B.

2.3.2 In accordance with the Hedgerow Survey Handbook (DEFRA, 2007), a hedgerow is defined as: "*any boundary line of trees or shrubs over 20 m long and less than 5 m wide at the base, provided that at one time the trees or shrubs were more or less continuous. It includes an earth bank or wall only where such a feature occurs in association with a line of trees or shrubs. This includes 'classic' shrubby hedgerows, lines of trees, shrubby hedgerows with trees and very gappy hedgerows (where each shrubby section may be less than 20 m long, but the gaps are less than 20 m).*"

2.3.3 Similarly, the limits (end points) of an individual hedgerow were defined using the following criteria:

- Any point of connection between two, or more, hedgerows or to other features e.g. fences, walls, ditches, roads.
- The point at which a hedgerow stops and there is a gap of more than 20 m to the next hedgerow (e.g. where the hedgerow ends in the middle of a field).
- The point at which the hedgerow links to a woodland or other semi-natural habitat.

2.3.4 In accordance with the Regulations, the woody species in each hedgerow were recorded along 30 m sampling sections. If the hedgerow was found to be 30 m or less in length, then the whole of the hedgerow was surveyed. If the hedge was between 30 and 100 m then the central 30 m was surveyed. If between 100 and 200 m in length, then the hedge was divided in two and the central 30 m of each of the two sections was surveyed. Similarly, for hedgerows in excess of 200 m, the hedge was divided into three sections and the central 30 m of each of the three sections was surveyed. The woody species, as listed on Schedule 3 of the Regulations, were counted in each section and the average number calculated by summing the number of species recorded in each section and dividing by the number of sections.

2.3.5 In addition to the criteria set out in the Regulations, notes were also made on the condition of each hedgerow, including height, width and growth type.

2.4 Limitations

2.4.1 The survey was undertaken during the optimal time of year, however remains of vernal woodland species may not be visible by mid-summer, especially in view of the prolonged hot and dry weather during June and July. The dense, overgrown nature of the hedgerows also made it difficult to undertake a thorough survey of the woodland ground flora. The recommendations in this report take full account of these limitations.

2.5 Evaluation

2.5.1 The habitats and species evaluations are based on the guidance from the Institute of Ecology and Environmental Management (CIEEM, 2016). The value of specific ecological receptors is assigned using a geographic frame of reference, i.e. international value being most important, then national, regional, county, district, local and lastly, within the immediate zone of influence of the proposals only.

2.5.2 Value judgements are based on various characteristics that can be used to identify ecological resources or features likely to be important in terms of biodiversity. These include site designations (such as SSSI), or for undesignated features, the size, conservation status (locally, nationally or internationally), and the quality of the ecological resource. In terms of the latter, 'quality' can refer to habitats (for instance if they are particularly diverse or a good example of a specific habitat type), other features (such as wildlife corridors or mosaics of habitats), or species populations / assemblages.

SECTION 3

Legislative and Planning Context

3.1 The Hedgerow Regulations

3.1.1 Hedgerows receive a degree of protection from removal under the Hedgerow Regulations 1997. However, various types of works to hedgerows are exempt, including:

- To make a new opening in substitution for an existing one that gives access to land or to obtain access to land where other means are not available or are only available at disproportionate cost.
- Where planning permission has been granted.
- To carry out work under certain Acts of Parliament for flood defence or land drainage purposes.
- By the Highway Agency.
- For the proper management of the hedgerow.

3.1.2 Any landowner who wishes to remove a hedgerow, if it is not exempt, must serve a Hedgerow Removal Notice in writing to their local planning authority. The authority then has 42 days (which period can be extended if the applicant agrees) to determine whether or not the hedge is considered 'important' under the Regulations, and if so, whether or not to issue a Hedgerow Retention Notice. The local authority is not required to issue a Retention Notice, even if the hedgerow counts as important. But if they do not issue a notice for an important hedge, this is generally on condition of mitigation or compensation, such as the creation of an equivalent boundary elsewhere.

3.1.3 The criteria for determining if a hedgerow qualifies as important are presented in Annex A.

3.2 The Natural Environment and Rural Communities Act 2006

3.2.1 Native hedgerows are a habitat of principal importance for conserving biodiversity in England, listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Under this Act, all public authorities in England and Wales have a duty to promote and enhance biodiversity in the exercise of their functions.

3.2.2 The Section 41 hedgerow habitat is defined as any boundary line of trees or shrubs over 20 m long and less than 5 m wide, and where any gaps between the trees or shrub species are less that 20 m wide. Any bank, wall, ditch or tree within 2 m of the centre of the hedgerow is considered to be part of the hedgerow habitat, as is the herbaceous vegetation within 2 m of the centre of the hedgerow. All hedgerows consisting predominantly (i.e. 80% or more cover) of at least one woody UK native species are covered by this priority habitat.

3.3 North Somerset Core Strategy

3.3.1 The North Somerset Core Strategy (Adopted January 2017) sets out the broad long-term vision, objectives and strategic planning policies for North Somerset up to 2026. It includes a number of Environmental Planning Policies. The following elements are of particular relevance to this study:

3.3.2 POLICY CS4: Nature Conservation. "*North Somerset contains outstanding wildlife habitats and species. These include limestone grasslands, traditional orchards, wetlands, rhynes, commons, hedgerows, ancient woodlands and the Severn Estuary. Key species include rare horseshoe bats, otters, wildfowl and wading birds, slow-worms and water voles. Measures by which the biodiversity of North Somerset will be maintained and enhanced under Policy CS4 include:*

- *seeking to ensure that new development is designed to maximise benefits to biodiversity, incorporating, safeguarding and enhancing natural habitats and features and adding to them where possible, particularly networks of habitats. A net loss of biodiversity interest should be avoided, and a net gain achieved where possible;*
- *seeking to protect, connect and enhance important habitats, particularly designated sites, ancient woodlands and veteran trees;*
- *promoting the enhancement of existing and provision of new green infrastructure of value to wildlife*."

3.3.3 POLICY CS9: Green Infrastructure. "*The existing network of green infrastructure will be safeguarded, improved and enhanced by further provision, linking in to existing provision where appropriate, ensuring it is a multi-functional, accessible network which promotes healthy lifestyles, maintains and improves biodiversity and landscape character and contributes to climate change objectives*."

3.4 Biodiversity and Trees Supplementary Planning Document

3.4.1 Adopted in December 2005, the Biodiversity and Trees Supplementary Planning Document ("SPD") seeks to further the actions of the national, regional and local Biodiversity Action Plans ("BAP"); guiding those submitting planning applications by supplementing the policies and proposals relating to biodiversity in the local plan, currently the North Somerset Council Core Strategy (adopted January 2017). The SPD gives particular regard to trees, protected sites and protected species and sets out measures to ensure that biodiversity is fully incorporated and best practice observed in development proposals.

3.4.2 The SPD sets out a nine point process for achieving these aims for developments, as follows:

- Screening. Screen all applications for existing biodiversity.
- Biodiversity Checklist. A biodiversity checklist should be completed and submitted with the planning application where the screening shows there are important issues for biodiversity.

- Wildlife Survey. Adequate survey data must be collected before submitting a planning application.
- Protect existing habitats and species. Avoid adverse impact to local, national or international sites, notable species, and local or national BAP species.
- Enhance and create habitats using BAP targets. Native plants and seeds of local provenance should be sought for new planting, while linkages between habitats and sites should be restored through appropriate management.
- Manage existing habitats and new habitats to maintain biodiversity interest. A management plan will need to be prepared and implemented as agreed, with the developer making financial provision for the ongoing management.
- Monitor to assess the success of the enhancement, mitigation and compensation measures for a period of at least 10 years.
- Mitigate to reduce adverse effects, in exceptional circumstances where damage to existing habitats is unavoidable.
- Compensate as a last resort where damage is unavoidable.

3.5 Biodiversity Action Plans

3.5.1 Following the Convention on Biological Diversity 1992, the UK BAP was published in 1994 and revised in 2007 to guide national strategy for the conservation of biodiversity. BAPs were the key nature conservation initiative in the UK, working at national, regional and local levels. The *UK Post-2010 Biodiversity Framework* (July, 2012) succeeds the UK BAP, and is the result of a change in strategic thinking following the publication of the CBD's *Strategic Plan for Biodiversity 2011–2020*. The lists of priority species and habitats agreed under UK BAP still form the basis of much biodiversity work in the UK countries, with UK BAP habitats and species included as habitats or species of principal importance under Section 41 of the Natural Environment and Rural Communities Act (2006) ("the NERC Act"). Local Planning Authorities have duties in relation to biodiversity under that Act.

3.5.2 Action for *Nature, the North Somerset Biodiversity Action Plan* ("NSBAP")[3] was produced in 2005 and sets out the conservation priorities and action needed to protect the biodiversity of the county. It also outlines who is responsible for delivering actions.

3.5.3 The NSBAP includes one Habitat Action Plan which incorporates hedgerows:

- Field boundaries and linear features. Aims and objectives include: Protect and enhance the wildlife value of existing boundary features and encourage the creation of new boundary features.

[3] North Somerset Council (2005) *Action for Nature, North Somerset Biodiversity Action Plan.*

SECTION 4

Results

4.1.1 The full results of the hedgerow survey are presented in Annex B and summarised in Figure 1 and Table 4.1 below.

Table 4.1: Summary Results of the Hedgerow Survey.

Hedge Number	Length (m)	Gaps (%)	Average number of woody spp.	No. of trees per 50m	Woodland species	Associated features	Important Hedgerow
1	226	4	9.33 (including small-leaved lime)	0.9	1	2	✓
2	85	20	3	0.6	0	0	✗

4.1.2 Both hedgerows were found to be overgrown and unmanaged and fringed by extensive areas of bramble *Rubus fruticosus* and, in the case of Hedgerow 1, suckering blackthorn *Prunus spinosa*. However, Hedgerow 1 is still intact, with only one gap of about 10 m along its entire length. Hedgerow 2 is defunct with gaps totalling 20% of the length of the hedgerow, with only dense bramble present along a large portion of the overall field boundary.

4.1.3 Hedgerow 1 is very species rich, with an average of 9.33 woody species listed on Schedule 3 of the Hedgerows Regulations across the three 30 m lengths surveyed. A total of 12 woody species were recorded in the most diverse of the three 30 m sections. By contrast, only 3 woody species were recorded in the surveyed central section of Hedgerow 2.

4.1.4 Only one woodland ground flora species listed on Schedule 2 of the Hedgerows Regulations was recorded: occasional hart's tongue fern *Phyllitis scolopendrium* in Hedgerow 1. However, access to the ground layer was only achievable at a few very limited points due to dense bramble and blackthorn. More species may be present. No woodland species were recorded along Hedgerow 2.

4.1.5 Hedgerow 1 qualifies as Important under the Hedgerows Regulations on purely biodiversity grounds, as follows:

- The hedgerow supports an average of 7 or more woody species.
- The hedgerow supports an average of 6 or more woody species including small-leaved lime *Tilia cordata.*

4.1.6 Hedgerow 2 is too species poor to qualify as Important under biodiversity or landscape criteria. Neither hedgerow qualifies as Important under the historical or archaeological criteria of the Regulations.

SECTION 5

Conclusion

5.1.1 Hedgerow 1 is very species rich and qualifies as Important under the biodiversity criteria of the Regulations, although the frequency of tree standards falls short of the threshold of at least 1 per 50 m set out as a criterion in the Regulations. Nevertheless, the hedgerow's species-richness, length, width and absence of intensive management means it is of considerable value to biodiversity in a local context. Hedgerows are a Section 41 habitat and field boundaries and linear features are a priority habitat in the NSBAP. For these reasons Hedgerow 1 is of Local value.

5.1.1.1 Hedgerow 2 is species-poor, fragmentary and largely dominated by bramble. It is readily recreatable in the short term and is considered to have value in the immediate zone of influence of the proposed works only.

5.1.2 It should be noted that planning permission over-rides the protection afforded important hedgerows under the Regulations, but the legal protection afforded to hedgerows under the Regulations and their listing as a habitat of principal concern under Section 41 of the NERC Act does mean they should be treated as a material consideration in the planning process.

SECTION 6

References and Bibliography

Bristol Regional Environmental Records Centre, 2014. MetroWest Data Report *Enquiry 2482, 2483 and 2487.*

CIEEM (Chartered Institute of Ecology and Environmental Management), 2016. *Guidelines for Ecological Impact Assessment within the United Kingdom.* Terrestrial, Freshwater and Coastal. Second edition. IEEM. Winchester.

DEFRA, 2011. *Biodiversity 2020: A strategy for England's wildlife and ecosystem services*.

Halcrow, 2011. *Ecological Appraisal - Portishead Railway.* North Somerset Council.

JNCC and DEFRA, 2012. *UK Post-2010 Biodiversity Framework.* Prepared on behalf of the four countries' Biodiversity Group.

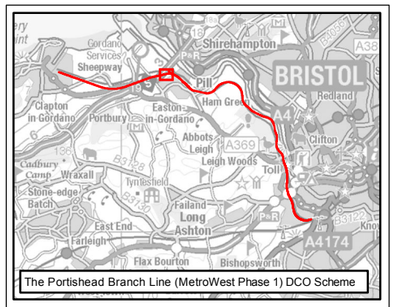
Websites

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

Figures

N

Cycle Track
M5
Drain
Drain
Track
Pond
Drain
MP126.5
Gantry
Cycle Path
LC
Hedgerow 1
Hedgerow 2
Ward Bay
CF
THE BREACHES
Lodway
Pond



KEY

- Hedgerow Survey Boundary

Phase 1 Hedgerow Survey

- J2.1.1, Intact hedge - native species-rich
- J2.1.2, Intact hedge - species-poor

Portishead Branch Line

- The Nationally Significant Infrastructure Project (NSIP) Works

0 40 80

Metres

ES-A	MPC	EE	CF	12/04/2019	First draft
Rev	By	Chkd	Apprvd	Date	Description

Client

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

CH2M HILL
Geospatial
Burderop Park, Swindon, SN4 0QD
Tel: +44 (0)1793 812479 Fax: +44 (0)1793 812089
www.ch2m.com

Project :

Portishead Branch Line
(MetroWest Phase 1)

Drawing :

Figure 1
Hedgerow Survey, Lodway
Construction Site Compound
APFP Regulation 5(2)(a)

Drawn By :	Martin Costello	Date: 12/04/2019
Checked By :	Clare Williams	Date: 12/04/2019
Approved By :	Carolyn Francis	Date: 12/04/2019

Drawing No. : 674946 -006-020-A

Revision ES-A

Drawing Scale : 1:1,500 @ A3

Document Path: \\swin-fs-06\Consulting\we\Environmental_Assessment\Projects\MetroWest Phase 1\GIS\MXDs\Ecology\674946-006-020_Figure_1_Hedgerow_Survey.mxd

Annex A
Criteria for Important Hedgerows under the Hedgerow Regulations 1997

Criteria for Important Hedgerows under the Hedgerow Regulations 1997

Hedgerows on or adjacent to the following land are covered by the Hedgerow Regulations 1997 unless the hedge is less than 30 years old and/or it lies within or marks the boundary of a curtilage or a dwelling-house:

- Common land;
- Village greens;
- Sites of Special Scientific Interest, National Nature Reserves, Special Protection Areas and Special Areas of Conservation;
- Local Nature Reserves;
- Land used for agriculture;
- Land used for forestry; and
- Land used for the breeding or keeping of horses, ponies or donkeys.

Criteria for Important Hedgerows, Schedule 1, Part 2. Archaeology and history

1. The hedgerow marks the boundary, or part of the boundary, of at least one historic parish or township; and for this purpose “historic” means existing before 1850.

2. The hedgerow incorporates an archaeological feature which is—

(a) included in the schedule of monuments compiled by the Secretary of State under section 1 (schedule of monuments) of the Ancient Monuments and Archaeological Areas Act 1979(7); or

(b) recorded at the relevant date in a Sites and Monuments Record.

3. The hedgerow—

(a) is situated wholly or partly within an archaeological site included or recorded as mentioned in paragraph 2 or on land adjacent to and associated with such a site; and

(b) is associated with any monument or feature on that site.

4. The hedgerow—

(a) marks the boundary of a pre-1600 AD estate or manor recorded at the relevant date in a Sites and Monuments Record or in a document held at that date at a Record Office; or

(b) is visibly related to any building or other feature of such an estate or manor.

5. The hedgerow—

(a) is recorded in a document held at the relevant date at a Record Office as an integral part of a field system pre-dating the Inclosure Act(8); or

(b) is part of, or visibly related to, any building or other feature associated with such a system, and that system—

(i) is substantially complete; or

(ii) is of a pattern which is recorded in a document prepared before the relevant date by a local planning authority, within the meaning of the 1990 Act(9), for the purposes of development control within the authority’s area, as a key landscape characteristic.

Wildlife and landscape

6.—(1) The hedgerow—

(a) contains species listed or categorised as mentioned in sub-paragraph (3); or

(b) is referred to in a record held immediately before the relevant date by a biological record centre maintained by, or on behalf of, a local authority within the meaning of the Local Government Act 1972(10), and in a form recognised by the Nature Conservancy Council for England, the Countryside Council for Wales(11) or the Joint Nature Conservation Committee(12), as having contained any such species—

(i) in the case of animals and birds, subject to sub-paragraph (2), within the period of five years immediately before the relevant date.

(ii) in the case of plants, subject to sub-paragraph (2), within the period of ten years immediately before the relevant date;

(2) Where more than one record referable to the period of five or, as the case may be, ten years before the relevant date is held by a particular biological record centre, and the more (or most) recent record does not satisfy the criterion specified in sub-paragraph (1)(b), the criterion is not satisfied (notwithstanding that an earlier record satisfies it).

(3) The species referred to in sub-paragraph (1) are those—

(a) listed in Part I (protection at all times) of Schedule 1 (birds which are protected by special penalties), Schedule 5 (animals which are protected) or Schedule 8 (plants which are protected) to the Wildlife and Countryside Act 1981(13);

(b) categorised as a declining breeder (category 3) in “Red Data Birds in Britain” Batten LA, Bibby CJ, Clement P, Elliott GD and Porter RF (Eds.), published in 1990 for the Nature Conservancy Council and the Royal Society for the Protection of Birds (ISBN 0 85661 056 9); or

(c) categorised as “endangered”, “extinct”, “rare” or “vulnerable” in Britain in a document mentioned in sub-paragraph (4).

(4) The documents referred to in sub-paragraph (3)(c) are—

(a) of the books known as the British Red Data Books:

1. “Vascular Plants” Perring FH and Farrell L, 2nd Edition, published in 1983 for the Royal Society for Nature Conservation (ISBN 0 902484 04 4);

2. “Insects” Shirt DB (Ed.), published in 1987 for the Nature Conservancy Council (ISBN 0 86139 380 5); and

3. “Invertebrates other than insects” Bratton JH (Ed.), published in 1991 for the Joint Nature Conservation Committee (ISBN 1 873701 00 4); and

(b) of the books known as the Red Data Books of Britain and Ireland: “Stoneworts” Stewart NF and Church JM, published in 1992 for the Joint Nature Conservation Committee (ISBN 1 873701 24 1).

7.—(1) Subject to sub-paragraph (2), the hedgerow includes—

(a) at least 7 woody species;

(b) at least 6 woody species, and has associated with it at least 3 of the features specified in sub-paragraph (4);

(c) at least 6 woody species, including one of the following—

black-poplar tree (*Populus nigra ssp betulifolia*);

large-leaved lime (*Tilia platyphyllos*);

small-leaved lime (*Tilia cordata*);

wild service-tree (*Sorbus torminalis*); or

(d) at least 5 woody species, and has associated with it at least 4 of the features specified in sub-paragraph (4), and the number of woody species in a hedgerow shall be ascertained in accordance with sub-paragraph (3).

(2) Where the hedgerow in question is situated wholly or partly in the county (as constituted on 1st April 1997) of the City of Kingston upon Hull, Cumbria, Darlington, Durham, East Riding of Yorkshire, Hartlepool, Lancashire, Middlesbrough, North East Lincolnshire, North Lincolnshire, Northumberland, North Yorkshire, Redcar and Cleveland, Stockton-on-Tees, Tyne and Wear, West Yorkshire or York(14), the number of woody species mentioned in paragraphs (a) to (d) of sub-paragraph (1) is to be treated as reduced by one.

(3) For the purposes of sub-paragraph (1) (and those of paragraph 8(b))—

(a) where the length of the hedgerow does not exceed 30 metres, count the number of woody species present in the hedgerow;

(b) where the length of the hedgerow exceeds 30 metres, but does not exceed 100 metres, count the number of woody species present in the central stretch of 30 metres;

(c) where the length of the hedgerow exceeds 100 metres, but does not exceed 200 metres, count the number of woody species present in the central stretch of 30 metres within each half of the hedgerow and divide the aggregate by two;

(d) where the length of the hedgerow exceeds 200 metres, count the number of woody species present in the central stretch of 30 metres within each third of the hedgerow and divide the aggregate by three.

(4) The features referred to in sub-paragraph (1)(b) and (d) (which include those referred to in paragraph 8(b)) are—

(a) a bank or wall which supports the hedgerow along at least one half of its length;

(b) gaps which in aggregate do not exceed 10% of the length of the hedgerow;

(c) where the length of the hedgerow does not exceed 50 metres, at least one standard tree;

(d) where the length of the hedgerow exceeds 50 metres but does not exceed 100 metres, at least 2 standard trees;

(e) where the length of the hedgerow exceeds 100 metres, such number of standard trees (within any part of its length) as would when averaged over its total length amount to at least one for each 50 metres;

(f) at least 3 woodland species within one metre, in any direction, of the outermost edges of the hedgerow;

(g) a ditch along at least one half of the length of the hedgerow;

(h) connections scoring 4 points or more in accordance with sub-paragraph (5);

(i) a parallel hedge within 15 metres of the hedgerow.

(5) For the purposes of sub-paragraph (4)(h) a connection with another hedgerow scores one point and a connection with a pond or a woodland in which the majority of trees are broad-leaved trees scores 2 points; and a hedgerow is connected with something not only if it meets it but also if it has a point within 10 metres of it and would meet it if the line of the hedgerow continued.

8. The hedgerow—

(a) is adjacent to a bridleway or footpath, within the meaning of the Highways Act 1980(15), a road used as a public path, within the meaning of section 54 (duty to reclassify roads used as public paths) of the Wildlife and Countryside Act 1981(16), or a byway open to all traffic, within the meaning of Part III of the Wildlife and Countryside Act 1981(17), and

(b) includes at least 4 woody species, ascertained in accordance with paragraph 7(3) and at least 2 of the features specified in paragraph 7(4)(a) to (g).

Regulation 2(3) and Schedule 1, Part I

SCHEDULE 2 WOODLAND SPECIES

Barren strawberry (*Potentilla sterilis*)

Bluebell (*Hyacinthoides non-scriptus*)

Broad buckler fern (*Dryopteris dilatata*)

Broad-leaved helleborine (*Epipactis helleborine*)

Bugle (*Ajuga reptans*)

Common cow-wheat (*Melampyrum pratense*)

Common dog violet (*Viola riviniana*)

Common polypody (*Polypodium vulgare*)

Dog's mercury (*Mercurialis perennis*)

Early dog violet (*Viola reichenbachiana*)

Early purple orchid (*Orchis mascula*)

Enchanter's nightshade (*Circaea lutetiana*)

Giant fescue (*Festuca gigantea*)

Goldilocks buttercup (*Ranunculus auricomus*)

Great bell-flower (*Campanula latifolia*)

Greater wood-rush (*Luzula sylvatica*)

Hairy brome (*Bromus ramosus*)

Hairy woodrush (*Luzula pilosa*)

Hard fern (*Blechnum spicant*)

Hard shield fern (*Polystichum aculeatum*)

Hart's tongue (*Asplenium scolopendrium*)

Heath bedstraw (*Galium saxatile*)

Herb paris (*Paris quadrifolia*)

Herb-robert (*Geranium robertianum*)

Lady fern (*Athyrium filix-femina*)

Lords-and-ladies (*Arum maculatum*)

Male fern (*Dryopteris filix-mas*)

Moschatel (*Adoxa moschatellina*)

Narrow buckler-fern (*Dryopteris carthusiana*)

Nettle-leaved bell-flower (*Campanula trachelium*)

Oxlip (*Primula elatior*)

Pignut (*Conopodium majus*)

Primrose (*Primula vulgaris*)

Ramsons (*Allium ursinum*)

Sanicle (*Sanicula europaea*)

Scaly male-fern (*Dryopteris affinis*)

Small cow-wheat (*Melampyrum sylvaticum*)

Soft shield fern (*Polystichum setiferum*)

Sweet violet (*Viola odorata*)

Toothwort (*Lathraea squamaria*)

Tormentil (*Potentilla erecta*)

Wild strawberry (*Fragaria vesca*)

Wood anemone (*Anemone nemorosa*)

Wood avens/Herb bennet (*Geum urbanum*)

Wood false-brome (*Brachypodium sylvaticum*)

Wood horsetail (*Equisetum sylvaticum*)

Wood meadow-grass (*Poa nemoralis*)

Wood melick (*Melica uniflora*)

Wood millet (*Millium effusum*)

Wood sage (*Teucrium scorodonia*)

Wood sedge (*Carex sylvatica*)

Wood sorrel (*Oxalis acetosella*)

Wood speedwell (*Veronica montana*)

Wood spurge (*Euphorbia amygdaloides*)

Woodruff (*Galium odoratum*)

Yellow archangel (*Lamiastrum galeobdolon*)

Yellow pimpernel (*Lysimachia nemorum*)

Regulation 2(3) and Schedule 1, Part I

SCHEDULE 3 WOODY SPECIES

Alder (*Alnus glutinosa*)
Apple, crab (*Malus sylvestris*)
Ash (*Fraxinus excelsior*)
Aspen (*Populus tremula*)
Beech (*Fagus sylvatica*)
Birch, downy (*Betula pubescens*)
Birch, silver (*Betula pendula*)
Black-poplar (*Populus nigra* sub-species *betulifolia*)
Blackthorn (*Prunus spinosa*)
Box (*Buxus sempervirens*)
Broom (*Cytisus scoparius*)
Buckthorn (*Rhamnus cathartica*)
Buckthorn, alder (*Frangula alnus*)
Butcher's-broom (*Ruscus aculeatus*)
Cherry, bird (*Prunus padus*)
Cherry, wild (*Prunus avium*)
Cotoneaster, wild (*Cotoneaster integerrimus*)
Currant, downy (*Ribes spicatum*)
Currant, mountain (*Ribes alpinum*)
Dogwood (*Cornus sanguinea*)
Elder (*Sambucus nigra*)
Elm (*Ulmus* species)
Gooseberry (*Ribes uva-crispa*)
Gorse (*Ulex europaeus*)
Gorse, dwarf (*Ulex minor*)
Gorse, western (*Ulex gallii*)
Guelder rose (*Viburnum opulus*)
Hawthorn (*Crataegus monogyna*)
Hawthorn, midland (*Crataegus laevigata*)
Hazel (*Corylus avellana*)
Holly (*Ilex aquilfolium*)
Hornbeam (*Carpinus betulus*)
Juniper, common (*Juniperus communis*)
Lime, large-leaved (*Tilia platyphyllos*)
Lime, small-leaved (*Tilia cordata*)
Maple, field (*Acer campestre*)
Mezereon (*Daphne mezereum*)
Oak, pedunculate (*Quercus robur*)
Oak, sessile (*Quercus petraea*)
Osier (*Salix viminalis*)
Pear, Plymouth (*Pyrus cordata*)
Pear, wild (*Pyrus pyraster*)
Poplar, grey (*Populus* x *canescens*)
Poplar, white (*Populus alba*)
Privet, wild (*Ligustrum vulgare*)
Rose (*Rosa* species)
Rowan (*Sorbus aucuparia*)
Sea-buckthorn (*Hippophae rhamnnoides*)
Service-tree, wild (*Sorbus torminalis*)
Spindle (*Euonymus europaeus*)
Spurge-laurel (*Daphne laureola*)
Walnut (*Juglans regia*)
Wayfaring-tree (*Viburnum lantana*)
Whitebeam (*Sorbus* species)
Willow (*Salix* species)
Yew (*Taxus baccata*)

Annex B
Hedgerow Assessment Results

HEDGEROW SURVEY					
Hedgerow Number	1		**Date**	05/07/18	
Weather Conditions	Hot, dry, calm and sunny		**Surveyor(s)**	R. Thompson	
Grid references	**Start**		**End**		
Total length of hedge (m)	226		**Number of 30m sections to be assessed**	3	
Height of hedge (m)	6		**Width of hedge** (m)	5	
Length of gaps in hedge (as an overall % of length)	4%		**Number of mature trees (>20cm DBH) in total length of hedge**	4	
Ditch present?	No		**Orientation of ditch**	n/a	**Wet or Dry Ditch**	n/a

List of Schedule 3 Species for hedgerow assessment within 30m sections.

Schedule 2 species, to be recorded along entire length of hedge
(within 1m of outermost edges of the hedgerow)

Scientific Name	Common name	Section 1 (30m)	Section 2 (30m)	Section 3 (30m)	General DAFOR	Scientific Name	Common Name	DAFOR
Acer campestre	Field maple					*Adoxa moschatellina*	Moschatel	
Alnus glutinosa	Alder					*Ajuga reptans*	Bugle	
Betula pendula	Silver birch					*Allium ursinum*	Ramsons	
Betula pubescens	Downy birch					*Anemone nemorosa*	Wood anemone	
Carpinus betulus	Hornbeam					*Arum maculatum*	Lords-and-ladies	
Cornus sanguinea	Dogwood					*Athyrium filix-femina*	Lady fern	
Corylus avellana	Hazel	yes	yes	yes	F	*Brachypodium sylvaticum*	Wood false-brome	
Crataegus laevigata	Midland hawthorn					*Bromus ramosus*	Hairy brome	
Crataegus monogyna	Hawthorn	yes	yes	yes	A	*Campanula trachelium*	Nettle-leaved bellflower	
Daphne laureola	Spurge-laurel					*Carex sylvatica*	Wood sedge	

List of Schedule 3 Species for hedgerow assessment within 30m sections.

Schedule 2 species, to be recorded along entire length of hedge
(within 1m of outermost edges of the hedgerow)

Scientific Name	Common name	Section 1 (30m)	Section 2 (30m)	Section 3 (30m)	General DAFOR	Scientific Name	Common Name	DAFOR
Daphne mezereum	Daphne mezereon					*Circaea lutetiana*	Enchanters nightshade	
Euonymus europaeus	Spindle		yes	yes	O	*Conopodium majus*	Pignut	
Fagus sylvatica	Beech					*Dryopteris affinis*	Scaly male-fern	
Frangula alnus	Alder buckthorn					*Dryopteris carthusiana*	Narrow buckler fern	
Fraxinus excelsior	Ash		yes	yes	O	*Dryopteris dilatata*	Broad buckler-fern	
Ilex aquifolium	Holly					*Dryopteris filix-mas*	Male fern	
Ligustrum vulgare	Wild privet		yes	yes	O	*Epipactis helleborine*	Broad-leaved helleborine	
Malus sylvestris	Crab apple	yes	yes		O	*Equisetum sylvaticum*	Wood horsetail	
Populus alba	White poplar					*Euphorbia amygdaloides*	Wood spurge	
Populus nigra ssp betulifolia	Black poplar					*Festuca gigantea*	Giant fescue	
Populus tremula	Aspen					*Fragaria vesca*	Wild strawberry	
Populus x canescens	Grey poplar					*Galium odoratum*	Sweet woodruff	
Prunus avium	Wild cherry					*Geranium robertianum*	Herb Robert	
Prunus spinosa	Blackthorn	yes	yes	yes	A	*Geum urbanum*	Wood aven	
Pyrus cordata	Plymouth pear					*Hyacinthoides non-scripta*	Bluebell	

List of Schedule 3 Species for hedgerow assessment within 30m sections.

Schedule 2 species, to be recorded along entire length of hedge
(within 1m of outermost edges of the hedgerow)

Scientific Name	Common name	Section 1 (30m)	Section 2 (30m)	Section 3 (30m)	General DAFOR	Scientific Name	Common Name	DAFOR
Pyrus pyraster	Wild pear					*Lamiastrum galeobdolon*	Yellow archangel	
Quercus robur	Pedunculate oak		yes	yes	O	*Lathraea squamaria*	Toothwort	
Rhamnus cathartica	Buckthorn					*Luzula pilosa*	Hairy wood-rush	
Ribes uva-crispa	Gooseberry					*Melampyrum pratense*	Common cow-wheat	
Rosa species	Rose species					*Mercurialis perennis*	Dog's mercury	
Salix species	Willow species	yes	yes		O	*Milium effusum*	Wood millet	
Salix viminalis	Osier					*Orchis mascula*	Early purple orchid	
Sambucus nigra	Elder					*Oxalis acetosella*	Wood sorrel	
Sorbus aucuparia	Rowan					*Phyllitis scolopendrium*	Hart's tongue	O
Sorbus species	Whitebeam species		yes		R	*Poa nemoralis*	Wood meadow-grass	
Sorbus torminalis	Wild service tree					*Polypodium vulgare*	Common polypody	
Taxus baccata	Yew					*Polystichum aculeatum*	Hard shield fern	
Tilia cordata	Small-leaved lime	yes	yes	yes	F	*Polystichum setiferum*	Soft shield fern	
Tilia platyphyllos	Large-leaved lime							
Ulex europaeus	Gorse					*Potentilla sterilis*	Barren strawberry	

List of Schedule 3 Species for hedgerow assessment within 30m sections.

Schedule 2 species, to be recorded along entire length of hedge
(within 1m of outermost edges of the hedgerow)

Scientific Name	Common name	Section 1 (30m)	Section 2 (30m)	Section 3 (30m)	General DAFOR	Scientific Name	Common Name	DAFOR
Ulmus species	Elm species		yes	yes	O	*Primula elatior*	Oxlip	
Viburnum lantana	Wayfaring-tree					*Primula vulgaris*	Primrose	
Viburnum opulus	Guelder rose	yes			R	*Ranunculus auricomus*	Goldilocks buttercup	
						Sanicula europaea	Sanicle	
Other species						*Teucrium scorodonia*	Wood sage	
Acer platanoides	Norway maple			yes	R	*Veronica montana*	Wood speedwell	
						Viola odorata	Sweet violet	
Total species for each 30m section (not including other species)		**7**	**12**	**9**		*Viola reichenbachiana*	Early dog violet	
Average per 30m section			**9.33**			*Viola riviniana*	Common dog violet	
						Total		**1**

HEDGEROW ASSESSMENT	
Hedgerow features (taken from Hedgerow Regulations 1997 Part 11 Paragraph 7(4) to (i))**.**	
(a) A bank or wall which supports the hedgerow along at least half of its length;	No
(b) Gaps which aggregate do not exceed 10% of length of hedgerow;	Yes
(c) Where the length of the hedgerow does not exceed 50m, at least one standard tree; (standard tree >20cm DBH (or 63cm circ) and multi-stemmed is >15cm DBH (or 47cm circ).	No
(d) Where the length of the hedgerow exceeds 50m but does not exceed 100m, at least 2 standard trees;	No
(e) Where the length of the hedgerow exceeds 100m, such number of standard trees (within any part of its length) as would when averaged over its total length amount at least one for each 50m;	No
(f) At least 3 woodland species (Schedule 2) within one metre, in any direction, of the outermost edges of the hedgerow;	No
(g) A ditch along at least one half of the length of the hedgerow;	No
(h) Connections scoring 4 points or more in accordance with sub-paragraph (5) [3]	No
(i) A parallel hedge within 15m of the hedgerow.	Yes
Total number of features present	2

Notable shrub or herb species that occur along the length of the entire hedge which are not listed in Schedule 2 or 3
None noted

Total number of other hedgerows connecting to hedgerow that is subject of survey	
2	
Signs of use by notable fauna	
None noted	
Is the Hedgerow obviously less than 30 years in age?	No
Does hedge currently support **or** have desk study records of spp protected in Schedules 1, 5 or 8 of the WaCA, or red data book species for 2007 to date.	No
Does the hedge include at least 7 woody species (from Schedule 3)	Yes

HEDGEROW ASSESSMENT	
Does the hedge include at least 6 woody species (from Schedule 3) + 3 features listed overleaf?	No
Does the hedge include at least 6 woody species (from Schedule 3), including native black poplar, small or large lvd lime or service tree?	Yes
Does the hedge include at least 5 woody species (from Schedule 3) + four features listed overleaf?	No
Hedge adjacent to a bridleway, foot path/road used by public, path/byway open to all traffic + at least 4 woody species (from Schedule 3) + at least 2 of the features described in (a) to (g) above.	No
Qualifies as an 'IMPORTANT HEDGEROW'?	**Yes**

Notes

A species-rich, overgrown, unmanaged hedgerow with some evidence of supplementary planting. Inspecting the ground layer was difficult due to the width and density of the hedgerow and adjacent bramble and suckering blackthorn.

Photograph

HEDGEROW SURVEY					
Hedgerow Number	2		**Date**	05/07/18	
Weather Conditions	Hot, dry, calm and sunny		**Surveyor(s)**	R. Thompson	
Grid references	**Start**		**End**		
Total length of hedge (m)	85		**Number of 30m sections to be assessed**	1	
Height of hedge (m)	3		**Width of hedge** (m)	4	
Length of gaps in hedge (as an overall % of length)	20		**Number of mature trees (>20cm DBH) in total length of hedge**	1	
Ditch present?	no		**Orientation of ditch**	n/a	**Wet or dry Ditch** n/a

List of Schedule 3 Species for hedgerow assessment within 30m sections.

Scientific Name	**Common name**	**Section 1** (30m)	**General DAFOR**
Acer campestre	Field maple		
Alnus glutinosa	Alder		
Betula pendula	Silver birch		
Betula pubescens	Downy birch		
Carpinus betulus	Hornbeam		
Cornus sanguinea	Dogwood		
Corylus avellana	Hazel		
Crataegus laevigata	Midland hawthorn		
Crataegus monogyna	Hawthorn	Yes	D
Daphne laureola	Spurge-laurel		

Schedule 2 species, to be recorded along entire length of hedge (within 1m of outermost edges of the hedgerow)

Scientific Name	**Common Name**	**DAFOR**
Adoxa moschatellina	Moschatel	
Ajuga reptans	Bugle	
Allium ursinum	Ramsons	
Anemone nemorosa	Wood anemone	
Arum maculatum	Lords-and-ladies	
Athyrium filix-femina	Lady fern	
Brachypodium sylvaticum	Wood false-brome	
Bromus ramosus	Hairy brome	
Campanula trachelium	Nettle-leaved bellflower	
Carex sylvatica	Wood sedge	

List of Schedule 3 Species for hedgerow assessment within 30m sections.

Schedule 2 species, to be recorded along entire length of hedge (within 1m of outermost edges of the hedgerow)

Scientific Name	**Common name**	**Section 1** (30m)	**General DAFOR**	**Scientific Name**	**Common Name**	**DAFOR**
Daphne mezereum	Daphne mezereon			*Circaea lutetiana*	Enchanters nightshade	
Euonymus europaeus	Spindle			*Conopodium majus*	Pignut	
Fagus sylvatica	Beech			*Dryopteris affinis*	Scaly male-fern	
Frangula alnus	Alder buckthorn			*Dryopteris carthusiana*	Narrow buckler fern	
Fraxinus excelsior	Ash			*Dryopteris dilatata*	Broad buckler-fern	
Ilex aquifolium	Holly			*Dryopteris filix-mas*	Male fern	
Ligustrum vulgare	Wild privet			*Epipactis helleborine*	Broad-leaved helleborine	
Malus sylvestris	Crab apple			*Equisetum sylvaticum*	Wood horsetail	
Populus alba	White poplar			*Euphorbia amygdaloides*	Wood spurge	
Populus nigra ssp betulifolia	Black poplar			*Festuca gigantea*	Giant fescue	
Populus tremula	Aspen			*Fragaria vesca*	Wild strawberry	
Populus x canescens	Grey poplar			*Galium odoratum*	Sweet woodruff	
Prunus avium	Wild cherry			*Geranium robertianum*	Herb Robert	
Prunus spinosa	Blackthorn	Yes	O	*Geum urbanum*	Wood aven	
Pyrus cordata	Plymouth pear			*Hyacinthoides non-scripta*	Bluebell	

List of Schedule 3 Species for hedgerow assessment within 30m sections.

Schedule 2 species, to be recorded along entire length of hedge (within 1m of outermost edges of the hedgerow)

Scientific Name	**Common name**	**Section 1** (30m)	**General DAFOR**	**Scientific Name**	**Common Name**	**DAFOR**
Pyrus pyraster	Wild pear			*Lamiastrum galeobdolon*	Yellow archangel	
Quercus robur	Pedunculate oak			*Lathraea squamaria*	Toothwort	
Rhamnus cathartica	Buckthorn			*Luzula pilosa*	Hairy wood-rush	
Ribes uva-crispa	Gooseberry			*Melampyrum pratense*	Common cow-wheat	
Rosa species	Rose species	Yes	R	*Mercurialis perennis*	Dog's mercury	
Salix species	Willow species			*Milium effusum*	Wood millet	
Salix viminalis	Osier			*Orchis mascula*	Early purple orchid	
Sambucus nigra	Elder			*Oxalis acetosella*	Wood sorrel	
Sorbus aucuparia	Rowan			*Phyllitis scolopendrium*	Hart's tongue	
Sorbus species	Whitebeam species			*Poa nemoralis*	Wood meadow-grass	
Sorbus torminalis	Wild service tree			*Polypodium vulgare*	Common polypody	
Taxus baccata	Yew			*Polystichum aculeatum*	Hard shield fern	
Tilia platyphyllos	Large-leaved lime			*Polystichum setiferum*	Soft shield fern	
Ulex europaeus	Gorse			*Potentilla sterilis*	Barren strawberry	
Ulmus species	Elm species			*Primula elatior*	Oxlip	
Viburnum lantana	Wayfaring-tree			*Primula vulgaris*	Primrose	
Viburnum opulus	Guelder rose			*Ranunculus auricomus*	Goldilocks buttercup	
				Sanicula europaea	Sanicle	

List of Schedule 3 Species for hedgerow assessment within 30m sections.

Schedule 2 species, to be recorded along entire length of hedge (within 1m of outermost edges of the hedgerow)

Scientific Name	**Common name**	**Section 1** (30m)	**General DAFOR**	**Scientific Name**	**Common Name**	**DAFOR**
Other species				*Teucrium scorodonia*	Wood sage	
Buddleja davidii	Butterfly-bush	Yes	O	*Veronica montana*	Wood speedwell	
				Viola odorata	Sweet violet	
Total species for each 30m section (not including other species)		**3**		*Viola reichenbachiana*	Early dog violet	
Average per 30m section		**3**		*Viola riviniana*	Common dog violet	
				Total		**0**

HEDGEROW ASSESSMENT	
Hedgerow features (taken from Hedgerow Regulations 1997 Part 11 Paragraph 7(4) to (i))**.**	
(a) A bank or wall which supports the hedgerow along at least half of its length;	No
(b) Gaps which aggregate do not exceed 10% of length of hedgerow;	No
(c) Where the length of the hedgerow does not exceed 50m, at least one standard tree; (standard tree >20cm DBH (or 63cm circ) and multi-stemmed is >15cm DBH (or 47cm circ).	No
(d) Where the length of the hedgerow exceeds 50m but does not exceed 100m, at least 2 standard trees;	No
(e) Where the length of the hedgerow exceeds 100m, such number of standard trees (within any part of its length) as would when averaged over its total length amount at least one for each 50m;	No
(f) At least 3 woodland species (Schedule 2) within one metre, in any direction, of the outermost edges of the hedgerow;	No
(g) A ditch along at least one half of the length of the hedgerow;	No
(h) Connections scoring 4 points or more in accordance with sub-paragraph (5) [3]	No
(i) A parallel hedge within 15m of the hedgerow.	No
Total number of features present	0

Notable shrub or herb species that occur along the length of the entire hedge which are not listed in Schedule 2 or 3
None noted

Total number of other hedgerows connecting to hedgerow that is subject of survey
None
Signs of use by notable fauna
None noted

Is the Hedgerow obviously less than 30 years in age?	No
Does hedge currently support **or** have desk study records of spp protected in Schedules 1, 5 or 8 of the WaCA, or red data book species for 2007 to date.	No
Does the hedge include at least 7 woody species (from Schedule 3)	No
Does the hedge include at least 6 woody species (from Schedule 3) + 3 features listed overleaf?	No

Does the hedge include at least 6 woody species (from Schedule 3), including native black poplar, small or large lvd lime or service tree?	No
Does the hedge include at least 5 woody species (from Schedule 3) + four features listed overleaf?	No
Hedge adjacent to a bridleway, foot path/road used by public, path/byway open to all traffic + at least 4 woody species (from Schedule 3) + at least 2 of the features described in (a) to (g) above.	No
Qualifies as 'IMPORTANT HEDGEROW'?	**No**

Notes

A defunct unmanaged hedgerow with the gaps dominated by dense bramble.

Photograph

MetroWest

Portishead Branch Line (MetroWest Phase 1)

TR040011

Applicant: North Somerset District Council
6.25, Environmental Statement, Volume 4, Appendix 9.15 Network Rail Site Management Statement, Vegetation Management Plan and Habitats Regulations Assessment for the Avon Gorge
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, Regulation 5(2)(a)
Planning Act 2008

Author: CH2M

Avon Gorge SSSI and SAC

POD Branch Line

Site Management Statement for Network Rail

Valid for 5 years from 01.07.2018 until 30.06.2023

Natural England:
Chris Westcott, Land Management and Conservation Lead Adviser, Somerset, Avon and Wiltshire Area Team, Natural England, First Floor, Temple Quay House, 2 The Square, Bristol BS1 6EB, Tel:- 0300 060 2011 / Mobile 07786027774, Email: chris.j.westcott@naturlaengland.org.uk

Network Rail:
Tim Buffery, Network Rail, Sheriff Street, Worcester, Worcestershire, WR4 4HZ, Tel: 07801 033436 Email: tim.buffery@networkrail.co.uk

CONTENTS

Please note that this Site Management Statement is only valid once a signed letter has been issued from Natural England giving S28H Assent for the operations covered in Section 3.

i) SUMMARY

This Site Management Statement (SMS) has been produced by Natural England to give assent under section 28H of the Wildlife and Countryside Act 1981 (as amended) for routine maintenance operations undertaken by Network Rail at the Avon Gorge SSSI. The land affected by the SMS is outlined on the map in Appendix 1.

This SMS replaces the previously issued SMS which expired in 2008

ii) SUMMARY OF MANAGEMENT

Network Rail's main objective is to maintain the rail infrastructure to permit the safe and easy passage of trains. We have an obligation to manage our land for this main objective and also to comply with statutory conservation requirements as required by Natural England and to manage protected heritage features and habitats.

Network Rail will work with Natural England to agree the management required to maintain and enhance SSSIs on Network Rail land.

1.0 INTRODUCTION

1.1 Background

Operations agreed by Natural England are specified below, under section 3.0 *Routine maintenance operations which are granted assent under s28H of the Wildlife and Countryside Act 1981 (as amended),* and require no further consultation provided that activities fall within the stated scope.

Discussion with Natural England, and the submission of notices of proposals, will be required for activities that fall outside of the stated scope and include, but are not restricted to, activities listed under Appendix 4 (**List of operations requiring Natural England's consent for the SSSI**).

Emergency works ('*unforeseen event which has life threatening or extreme loss implications and requires immediate action*') may be undertaken by Network Rail as required, but Natural England must be notified of any such works as soon as possible.

Natural England's agreement to operations specified below is to Network Rail only and does not give consent to other SSSI owners, occupiers or other parties. In such cases the normal notice procedure must be followed.

If Network Rail has any existing consents or assents under s.28 of the Wildlife and Countryside Act 1981 for any operations covered by this SMS, these are now surrendered.

1.2 Aims

Description of joint aims of Network Rail and Natural England.

As public bodies as defined in section 28G of the Wildlife and Countryside Act 1981 (as amended), Natural England and Network Rail have a duty to conserve and enhance the special interest features of the SSSI when undertaking their statutory functions. This SMS will help both bodies fulfil this duty.

1.3 Objectives of Network Rail

- To manage Network Rail's land to permit the safe and easy passage of trains through the site.
- To comply with statutory conservation requirements.
- To protect and manage the heritage features and natural habitats within Network Rail's care.
- To work with Natural England at a local level to agree management required to maintain and enhance (where possible) the SSSI in a favourable/recovering condition.

1.4 Objectives of Natural England

- To conserve and where possible enhance the interest features for which the SSSI has been notified by maintaining or restoring them to a favourable/recovering condition.
- Where the SSSI also forms part of a European Special Area of Conservation (SAC), to avoid the deterioration of the SAC's qualifying natural habitats and the habitats of its qualifying species (if appropriate), and the significant disturbance of any qualifying species, ensuring the integrity of the site is maintained and the site makes a full contribution to achieving Favourable Conservation Status of each of the qualifying features.
- To work with Network Rail to agree management required to maintain the SSSI in a recovering condition with an aim of moving the site forward into favorable/recovering condition within the term of the SMS.

1.5 European Site Conservation Objectives

The detailed European Site Conservation Objectives (for SACs/SPAs) can be found at:
http://www.naturalengland.org.uk/ourwork/conservation/designatedareas/sac/conservationobjectives.aspx

2.0 SITE INFORMATION

Avon Gorge SSSI lies on the edge of Bristol. Network Rails interest is in the form of two railway lines to Severn Beach on the north side of the gorge and the Royal Portbury branch to the south

CNX ST558 747- ST555 748

POD ST565 725 - ST547 756

2.1 Overview

The Avon Gorge SSSI / SAC provides an impressive backdrop for many parts of Bristol. It is an iconic landscape with the historic Clifton Suspension Bridge spanning the deep gorge and tidal river flowing out into the Severn Estuary.

The Avon Gorge is known as one of the best botanical sites in the Country and supports some 27 nationally rare and scarce plant species. It is considered to be one of the best places in the world for rare whitebeam trees and supports species, such as the Bristol and Wilmott's whitebeams (*Sorbus bristoliensis* and *S. wilmottiana*) which grow here, and nowhere else. The rare whitebeams are adapted to living on the thin soils of the gorge and most are found growing in the open rocky areas. The smaller rare plants are mainly associated with the limestone grassland communities and grow on the open rocky outcrops and grassy slopes. They include plants like the Round-headed leek or 'Bristol onion' (*Allium spaeocephalon)* and Bristol rock-cress (*Arabis scabra*), which grow in the gorge and nowhere else in the UK.

The Avon Gorge supports horseshoe bats, peregrine falcons, ravens and other important species including the rare silky wave moth which is only found in two other sites in the UK.

The Gorge is also a nationally important geological site (which is reflected as part of the SSSI designation) and been studied since the early 19th century. The rock formations show the complete local succession of Carboniferous Limestone. The succession spans the entire Tournaisian and Visean Stages, and also includes the Devonian Portishead Beds below. Some of the rock formations are a result of the extensive quarrying that took place in the gorge.

The main issues that affect the SSSI / SAC condition of the Avon Gorge are the growth and spread of scrub and invasive non-native species. These plants (including native scrub species such as bramble (*Rubus* subgenus *rubus*), blackthorn (*Prunus spinosa*), hawthorn (*Crataegus monogyna*), ivy (*Hedera helix*), privet (*Ligustrum vulgare*), etc. and non-native species including various *Cotoneaster* species, holm oak (*Quercus ilex*), and laurestine (*Viburnum tinus*) etc.) are particularly competitive and threaten the notable small vascular plants which only survive in open conditions. Whitebeam trees are also threatened by shading out within woodland (again these are plants of open space, generally found growing of thin rocks cliff edge soils). There are also threats to whitebeam trees from human activities especially via accidental and intentional cutting.

Geological interest can also be damaged and obscured by the growth of trees and scrubby species and this needs to be monitored and managed if required.
There are particular issues on the North Somerset side of the Avon Gorge with large amounts of anti-social behaviour. The main problem is caused from people graffitiing areas of open rock which are often home to many of the rare species referred to above. This not only occurs within the Network Rail ownership boundary but also on adjacent landowners' land which can be accessed by people dangerously crossing the railway line itself.

All of the above considerations must be taken into account through this SMS and Natural England is keen to work closely with Network Rail to ensure that the SSSI and SAC are favourably managed.

2.2 Description of the land under Network Rail's control (see appendices for maps)

Network Rails land ownership covers land on both North Somerset and Bristol side of the Avon Gorge (the exact area is defined in **Appendix 1 - Maps of the land under Network Rail's control**). This area consists of areas of mature woodland, open rock faces, grassy slopes, salt marsh, scrub and railway embankments. Details regarding the populations of rare species within the Network Rail ownership boundary are held by Network Rail (Rare trees are physically marked / tagged and other rare habitat locations identified – both recorded using GPS / mapping systems). The survey helps to identify areas of problem species and then be used to help guide positive management and be adopted into the existing SMS.

The Portishead branch is an area that has rare trees notably Whitebeams (*Sorbus spp*.) (these have in the past been identified by yellow banding but can now be identified by orange and blue ribbons or the same coloured paint). *Sorbus spp*. are known in the area 123m50ch and 123m70ch and are likely to extend elsewhere within the Network Rail ownership boundary. A high concentration of rare trees and herbaceous plants are also known to be present in the area 122m27ch (but as above may not be limited to this location).

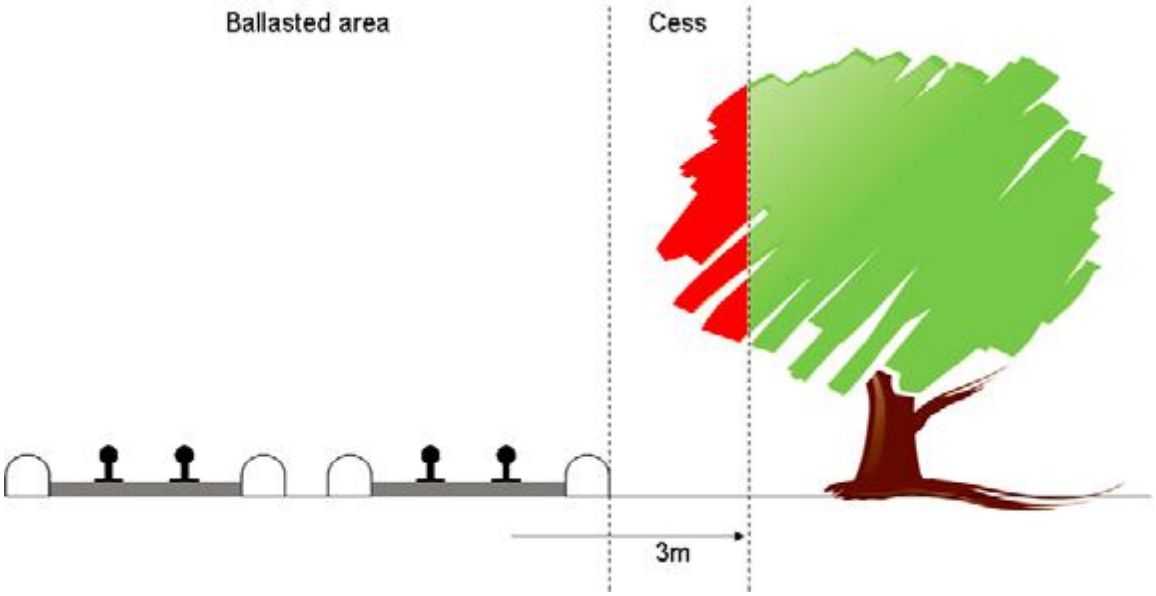
The proposals set out in this SMS is to manage the area designated SAC & SSSI along the Portbury branch line on the southerly side of the Avon Gorge (North Somerset). A separate SMS is to be developed for the northerly (Bristol Council) Severn beach line side.

3.0 OPERATIONS WHICH ARE GRANTED ASSENT UNDER SECTION 28H OF THE WILDLIFE AND COUNTRYSIDE ACT 1981 (AS AMENDED)

3.1 Routine Maintenance Operations

- To permit the safe and easy passage of trains through the site.
- Vegetation shall be maintained as specified below in Figure 1:

Figure 1 – Lineside Vegetation Management Distances



- The ballasted area shall be maintained clear of all woody vegetation. The area vertically above this shall also be maintained clear of all vegetation encroaching from other areas as shown in Figure 1.
- The cess (3 meters from line) shall be maintained clear of all woody vegetation. The area vertically above this shall also be maintained clear of all vegetation
- Maintain drainage so that it performs as designed to support the safe operation of the railway.
- Manage trees and vegetation beyond 3m of the line when and where required for the safe operation of the railway, taking account of the SAC and SSSI features and ensuring that they are not negatively affected by these actions. Efforts must first be made to find alternative methods of tree management (beyond felling) where a protected species is highlighted as a risk (DDD). For all of the above, if the tree is a rare species or qualifying species of the SSSI or SAC, consent from Natural England is required, except in emergency situations. Care should be taken when undergoing tree felling and rare species must not be disturbed (unless in emergency situations) without prior consent from Natural England.

- Management of arising's as set out in the vegetation management plan based on SAC feature and species. Removal of all INNS arising's.
- Network Rail will inform Natural England of any emergency works undertaken within the SSSI as soon as practical (Emergency works is not to be used as an excuse for planned work nor for using the SSSI to facilitate access for engineering work for which there is a reasonable option, albeit more costly in terms of resources, time etc.)
- Pesticide application within agreed weedspray restrictions. If application is by spraying within the SSSI boundary then it is only permitted as spot spraying with a knapsack sprayer fitted with a suitable nozzle to minimize any spray drift or by the use of a weedwiper when height differential is sufficient and ground conditions allow.
- Infrastructure renewal – major planned works beyond infrastructure maintenance will need consent from Natural England particularly if it involves vegetation management.
- A proposed action plan for the management of vegetation through the designated SSSI & SAC area on the southerly section of the Avon Gorge under Network Rail control. This plan is set out in **Appendix 6 – Avon Gorge SSSI & SAC Vegetation Management Plan**. This plan includes activities highlighted under routine vegetation management and those activities set out to enhance the qualifying features over the 5 year period of this SMS. Routine vegetation maintenance will be carried out in accordance with specifications controlled by Network Rail Management of Lineside Vegetation standards, where there is no impact on rare or protected species. Where vegetation management may impact on rare or protected species (as defined in **Appendix 2 – Citation for SSSI**) a decision on the best vegetation management options will be reviewed, in accordance with the site Vegetation Management Plan.
- Pest control of burrowing fauna, which may be potentially destabilizing to the rail bank (such as rabbits, mink and rats).
- Maintenance of Network Rail boundary fencing – major planned works beyond infrastructure maintenance will need consent from Natural England particularly if it involves vegetation management.
- Carry out infrastructure renewal coinciding with works to structures, ballast, rail, sleepers, level crossings, signalling and telecommunications, power infrastructure and geotechnics.
- The eradication of plant species, listed in Schedule 9, Part II of the Wildlife and Countryside Act 1981 and the Weeds Act 1959 will be a priority.
- Removal of introduced or invasive species on both sides of the gorge e.g holm oak, *Cotoneaster* species (*spp.*) etc. will be a secondary but important priority. Programme and techniques will be agreed with Natural England following the ecology survey.

Where consent is required for any additional operation as mentioned above, Network Rail will submit to Natural England a SSSI notice of proposed action form.

3.2 Enhancement operations

In order to ensure that the SSSI / SAC are in good condition (as a minimum in unfavourable recovering and ideally moving towards favourable) enhancement operations are recommended by Natural England:-

1. Network Rail to produce a detailed survey / record of whitebeam species of interest (including rare and threatened species but those also of note within the SSSI / SAC designations) within their ownership boundary (completed). This survey will sit alongside a current account of species of interest for the gorge (available in **Appendix 7 - Ecological Features of Interest within Land under Network Rail Control**). This survey will aim to recommend management works which will benefit the designated features (as set out in the Vegetation Management Plan).
2. Network Rail will review the security fencing to deter access into the various quarries to the west of the main line. The aim will be to reduce illegal activity and anti-social behavior that is damaging the SSSI / SAC features of interest. NR will request consent before undertaking any fencing activity.
3. Network Rail should repeat the scrub cutting adjacent to the tow path directly beneath the Clifton Suspension Bridge to ensure this important site for rare plants is protected (this work was last done in 2009 to benefit *Hornungia petraea* (hutchinsia) and *Pontentilla neumanniana* (spring cinquefoil) and is in need of being redone – and then regularly repeated (every 2 – 5 years dependent on growth).
4. Network Rail should consider options for tackling the graffiti issues of the area of open rock face directly beneath the Clifton Suspension Bridge within their ownership boundary.
5. Network Rail should take positive steps towards management of invasive scrub and particularly non-native species (INNS) to benefit the rare plants, whitebeam trees and geological interest features. This work will help benefit the wider gorge where other parties are proactively managing these problem species and unmanaged areas are acting as a seed source. Currently, reactive maintenance work is only carried out track side to ensure the safe operation of the railway. A scope of work will be established and agreed with Natural England to ensure that the areas of most interest are proactively managed as required to maintain and enhance their species interest. The 5 years of management given assent by this SMS will cover the restoration of the Avon Gorge SSSI/SAC features and safe running of the railway. A scope of proposed works is included in the Vegetation Management Plan (Appendix 6) but the final actions shall be discussed with Natural England before commencement.

6. Ensure that all management works take account of biodiversity and maintains other rare species for which the gorge has been identified as an important site.
7. Ensure a program of works established and agreed with Natural England to monitor and manage the areas of geological interest as required.
8. As an important influential land manager Network Rail should consider attending one of the regular Avon Gorge and Downs Wildlife Project meetings to update the group on progress toward the sites objectives.
9. Network Rail should also engage in the SAC SIP process and delivery.
10. Maintenance of the Avon Gorge will take place with attention and cooperation of the proposed MetroWest Phase 1 Project, which seeks to introduce a passenger train service along the POD line by 2021. At the time of assent the MetroWest Phase 1 Project has not been given formal approval under planning laws and cannot legally be commented on or relied on as a partner to deliver some of the works mentioned within the VMP or SMS. Therefore the scope of the VMP & SMS is based on what might be possible by Network Rail Infrastructure Ltd to deliver. MetroWest Phase 1 Project is however a key stakeholder in the development of the SMS and VMP. If the MetroWest Phase 1 project is given planning approval then the finer details of planned works will be shared, discussed and included to achieve the best outcome for the Avon Gorge SSSI/SAC.

4.0 ADDITIONAL ADVICE

4.1 Protection of breeding birds

All wild birds are protected by law. This includes their nests (whilst in use or being built) as well as any eggs the nest may contain. Under the Wildlife & Countryside Act 1981 (as amended), it is an offence to:

1. Intentionally kill, injure or take any wild bird;

2. Intentionally damage, destroy or take the nest of any wild bird while it is in use or being built (nests of golden eagle, white tailed eagle and osprey are protected all year round);

3. Intentionally destroy an egg of any wild bird;

4. Intentionally or recklessly disturb Schedule 1 wild birds or their dependent young while they are nesting (including disturbance of nesting young).

Although within the Wildlife and Countryside Act 1981 no dates are legally stated between which vegetation cannot be trimmed, cut, laid or coppiced, the main bird breeding season is recognised as being between March and August inclusive. Therefore the risk of committing any of the above offences is increased between these dates. It is recommended that if work **has** to be undertaken within these dates that a thorough check of all vegetation is carried out by appropriately qualified or skilled personnel for any signs of breeding activity first (such as observation from a distance using binoculars and direct searching of a hedge for nests). Vegetation management will be carried out in

accordance with Network Rail standards which set out procedures to protect nesting birds.

4.2 Protected Species

Additional protected species (for example badger, otter, bats, dormice, reptiles and great crested newt), which may or may not be a special interest feature of the Avon Gorge SSSI, may be present on Network Rail land.

Before activities are undertaken by Network Rail, further consideration must be given by Network Rail as to the possible presence of such species and the likely impact of activities on them, avoiding impacts where possible through following best practice guidance. A separate licence from Natural England may be needed if offences cannot be avoided.
See https://www.gov.uk/guidance/wildlife-licences for more information.

5.0 APPENDICES

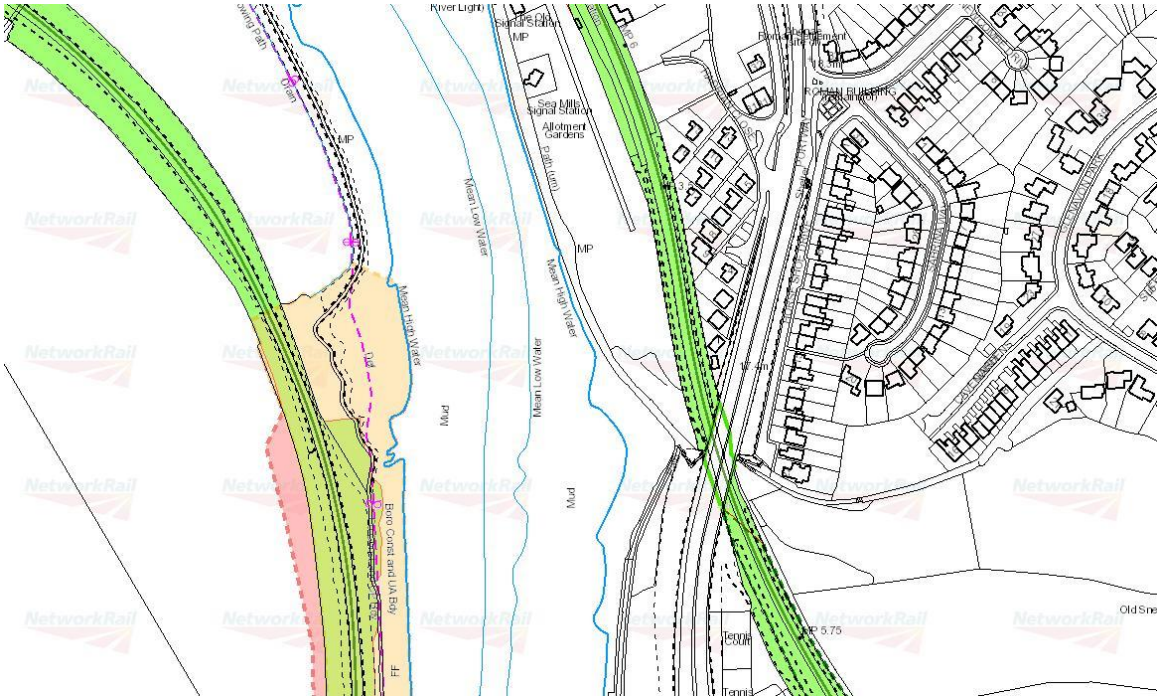
LIST OF APPENDICES

Appendix 1 - Map of the land under Network Rail's control
Appendix 2 - Citation for the SSSI
Appendix 3 – Boundary map for the SSSI
Appendix 4 – List of operations requiring Natural England's consent for the SSSI
Appendix 5 – Habitats Regulations Assessment (only to be completed by Network Rail if on a N2K designated site)
Appendix 6 – Avon Gorge SSSI & SAC Vegetation Management Plan
Appendix 7 - Appendix 7 - Ecological Features of Interest within Land under Network Rail Control

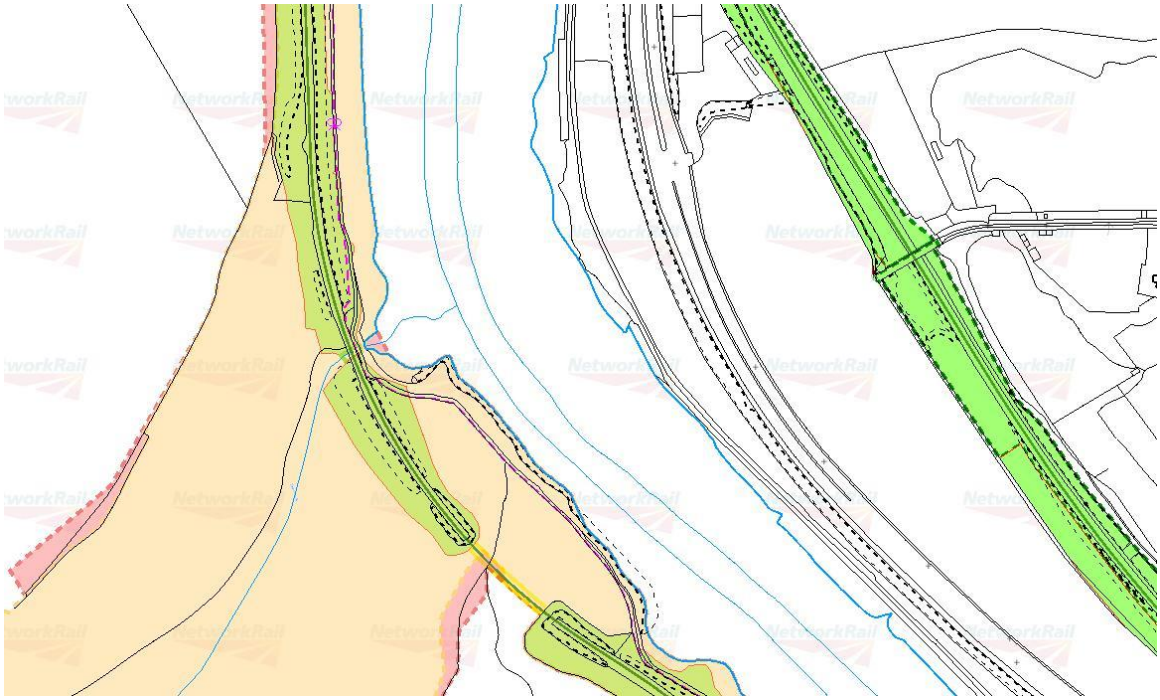
Appendix 1

Title:	**Maps of the land (From North to South) under Network Rail's control**
Scale:	**1 : 2,441**
Date Produced:	**20 October 2016**
Author:	**Chris Gaylard using Network Rail Mapping Software**
Orientation:	**All maps face north with top of map being north**
Details:	**First map is the most northern and last map most southern. Maps contain pink / orange shading depicting the SSSI and or SAC and green / brown areas the boundary of property owned and controlled by Network Rail.** **Map Based upon 2015 Boundary Survey.**

Map 1 – Northern edge of the SSSI through the Avon Gorge

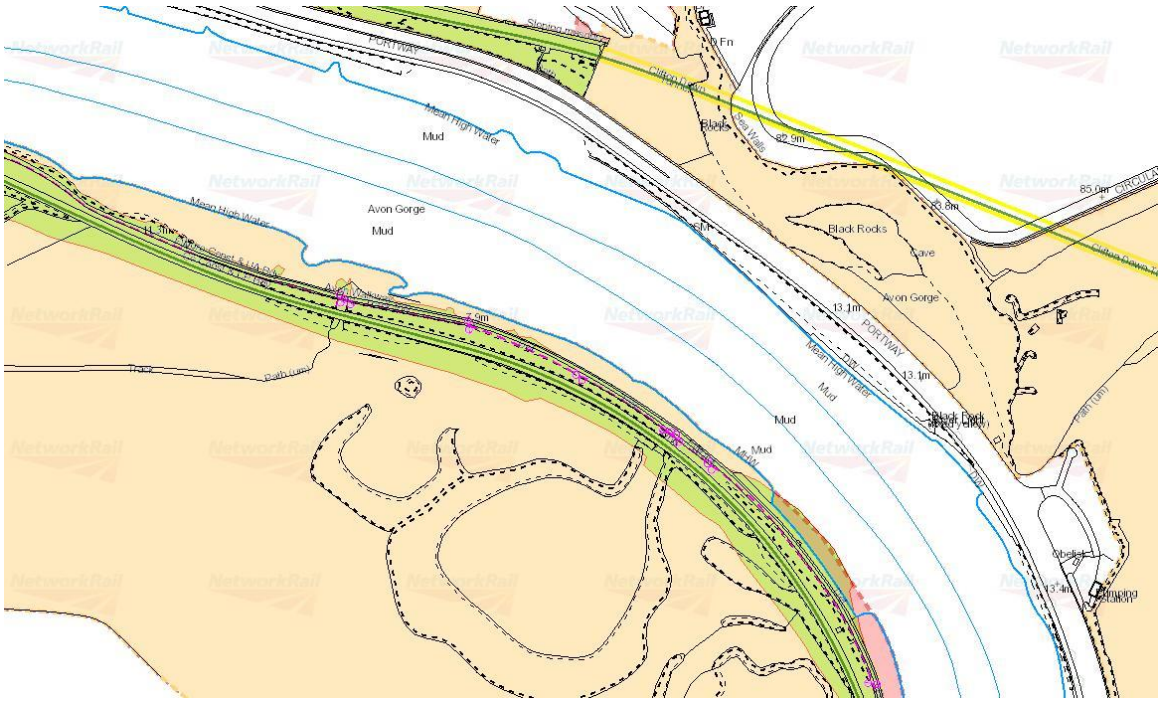


Map 2

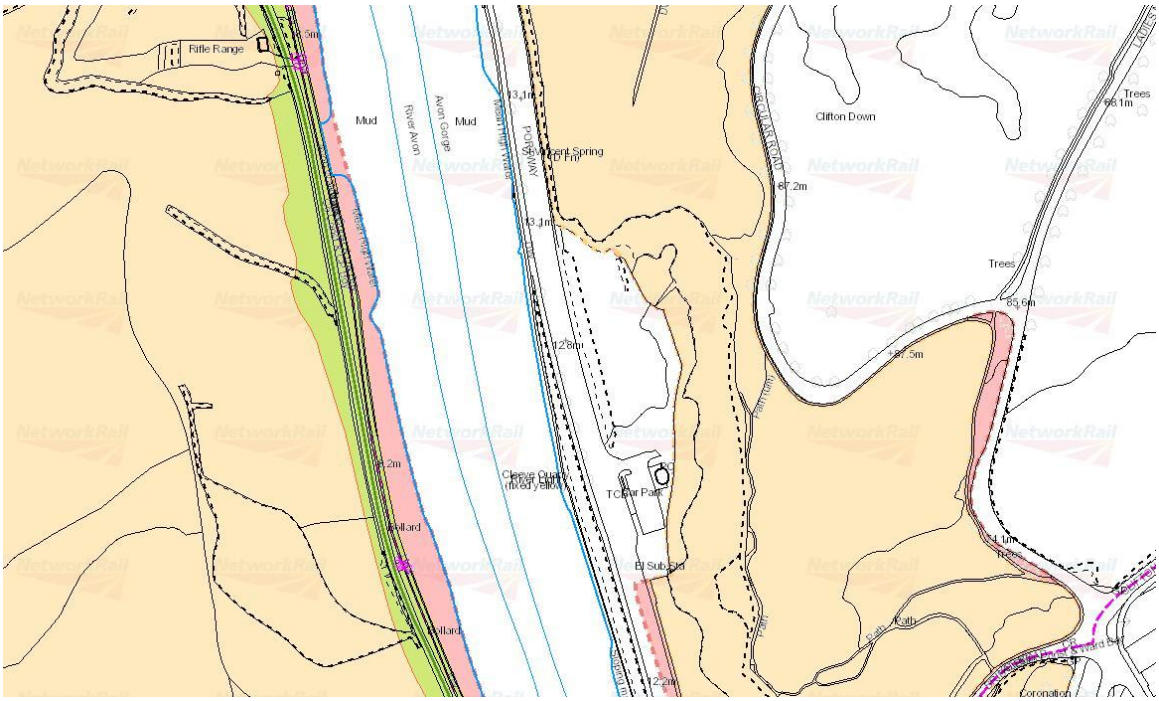


Map 3

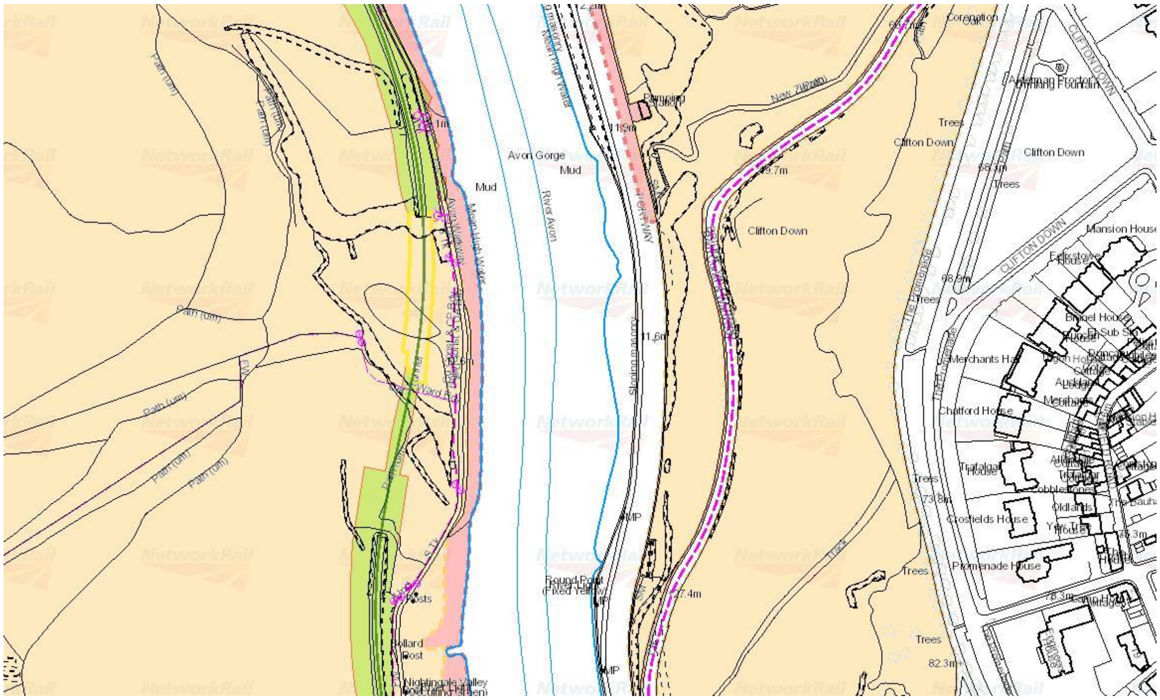
Map 4


Mean High Water
Mud
Avon Gorge
Mud
Mean High Water
Black Rocks
Cave
Avon Gorge
Mean High Water
Mud
Mud
Mud

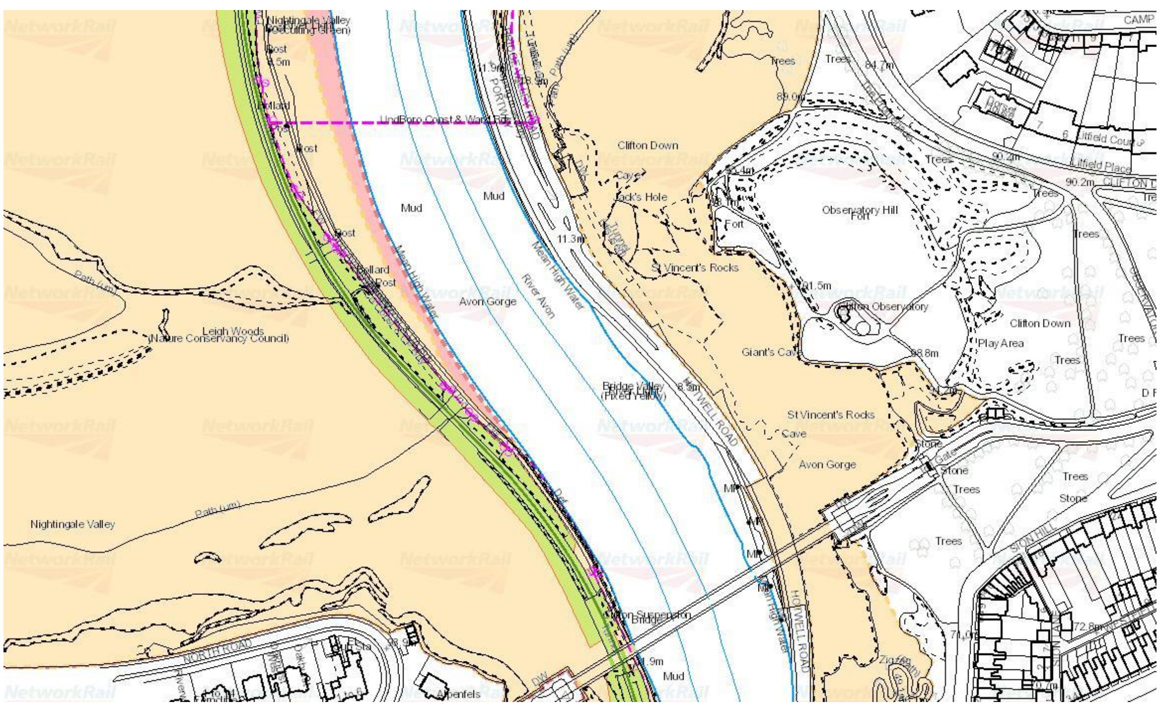
Map 5


Rifle Range
Mud
River Avon
Avon Gorge
Mud
Mean High Water
Clifton Down
Trees
Trees
Bollard
Bollard
Coronation

Map 6


Avon Gorge
Mud
River Avon
Mean High Water
Clifton Down
Trees
Merchants Hall
Chatford House
Trafalgar House
Crosfields House
Promenade House
Mansion House
Felixstowe House
Nightingale Valley
Bollard
Post
Path (um)

Map 7


Nightingale Valley
Leigh Woods
(Nature Conservancy Council)
Mud
Avon Gorge
River Avon
Mean High Water
Clifton Down
Cave
Jack's Hole
St Vincent's Rocks
Giant's Cave
Observatory Hill
Fort
Clifton Observatory
Play Area
Trees
Bridge Valley
(Fixed Yellow)
HOTWELL ROAD
NORTH ROAD
SION HILL
Clifton Suspension Bridge
Path (um)

Map 8

Appendix 2 - Citation for the SSSI

COUNTY: AVON SITE NAME: AVON GORGE

DISTRICT: WOODSPRING, BRISTOL CITY

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981 (as amended) Part is National Nature Reserve declared under Section 23 of the National Parks and Access to the Countryside Act 1949.

Local Planning Authority: Avon County Council, Woodspring District Council, Bristol City Council

National Grid Reference: ST 560743, 564740 Area: 155.4 (ha) 384.0 (ac)

Ordnance Survey Sheet 1:50,000: 172: 1 10,000: ST 57 NW, ST 57, NE,
ST 57 SW, ST 57 SE

Date Notified (Under 1949 Act): 1952 Date of Last Revision: 1974

Date Notified (Under 1981 Act): 1988 Date of Last Revision: –

Other Information:

Site listed in "A Nature Conservation Review" Ed D.A. Ratcliffe (Cambridge University Press 1977) and in the Geological Conservation Review. The National Nature Reserve is owned by the National Trust. Boundary has been amended by extension and deletion. Description and Reasons for Notification:

Avon Gorge lies on the edge of Bristol and rises about 100 metres from the tidal River Avon to Observatory Hill on the eastern side and Stokeleigh Camp to the west. The site includes part of Leigh Woods.

The Gorge has natural cliffs and quarry exposures of Carboniferous limestone, which are of great geological interest and, together with the screes, scrub, pockets of grassland and adjacent woodland, support an exceptional number of nationally rare and scarce plant species.

Nationally rare plants found on the gorge are Round-headed Leek *Allium sphaerocephalon*, Bristol Rock-cress *Arabis stricta*, which is unique to the site, Compact Brome *Bromus madritensis*, Nit-grass *Gastridium ventricosum*, Little Robin *Geranium purpureum ssp purpureum*, Western Spiked Speedwell *Veronica spicata ssp hybrida* and Honewort *Trinia glauca*. Nationally scarce plants in the gorge are Fingered Sedge *Carex digitata*, Dwarf Sedge *Carex humilis*, Dwarf Mouse-ear *Cerastium pumilum*, Hutchinsia *Hornungia petraea*, Spring Cinquefoil *Potentilla tabernaemontani*, Autumn Squill *Scilla*

autumnalis and Rock Stonecrop *Sedum fosterianum ssp elegans*. Other plants of restricted

distribution in Britain are Little-robin *Geranium purpureum* and Lesser Meadow-rue *Thalictrum minus*. Rock outcrops and small areas of limestone grassland in Leigh Woods support some of these rare and scarce plants. Angular Solomon's-seal *Polygonatum odoratum*, which is nationally scarce, occurs in the woodland.

Leigh Woods cover the gorge's western side, the plateau above and the steep valleys down to the River Avon and overlie the limestone except for a narrow band of Devonian sandstones to the north. The woods are mainly semi-natural, broadleaved woodland, but the site also includes areas of mixed and broadleaved plantation and parts are ancient woodland. The canopy has Pedunculate and Sessile Oak *Quercus robor* and *Q. petraea*, with Ash *Fraxinus excelsior*, Wych Elm *Ulmus glabra* much of which has died of Dutch Elm Disease, Small-leaved Lime *Tilia cordata*, Birch *Betula sp* and whitebeams *Sorbus spp*. Beech *Fagus sylvatica*, Hornbeam *Carpinus betulus*, Sycamore *Acer pseudoplatanus*, Spanish Chestnut *Castanea sativa*, Wild Cherry *Prunus avium* and occasional hybrid limes *Tilia spp* have all been planted, sometimes in single species stands. The shrub layer is discontinuous, with frequent Hazel *Corylus avellana* and occasional Field Maple *Acer campestre*, Privet *Ligustrum vulgare*, Hawthorn *Crataegus monogyna*, Spindle *Euonymus europaeus*, Dogwood *Cornus sanguinea* and Yew *Taxus baccata*. The main ground layer species are Ivy *Hedera helix*, Male Fern *Dryopteris filixmas*, Bluebell *Hyacinthoides non-scripta*, Ramsons *Allium ursinum*, Dog's Mercury *Mercurialis perennis* and Bramble *Rubus fruticosus*. The ground flora is very diverse and plants of particular note include Columbine *Aquilegia vulgaris*, Lily-of-the-Valley *Convallaria majalis*, Ivy Broomrape *Orobanche hederae*, Toothwort *Lathraea squamaria*, Wild Madder *Rubia peregrina*, Green Hellebore *Helleborus viridis*, Softshield Fern *Polystichum setiferum*, Southern Polypody *Polypodium cambricum* and Beech Fern *Thelypteris phegopteris*.

The northern slope of Paradise Bottom has fine Small-leaved Lime high forest and young Ash stands, with ground layers dominated by Ramsons.

The woods and gorge have an exceptional diversity of whitebeams *Sorbus spp* including two which are unique to Avon Gorge, *Sorbus bristoliensis* and *S. wilmottiana*. *S. anglica* and *S. eminens*, national rarities, and the nationally scarce *S. porrigentiformus* also occur. Of the other species, Wild Service-tree *S. torminalis* and the introduced Swedish Whitebeam *S. intermedia* are of note.

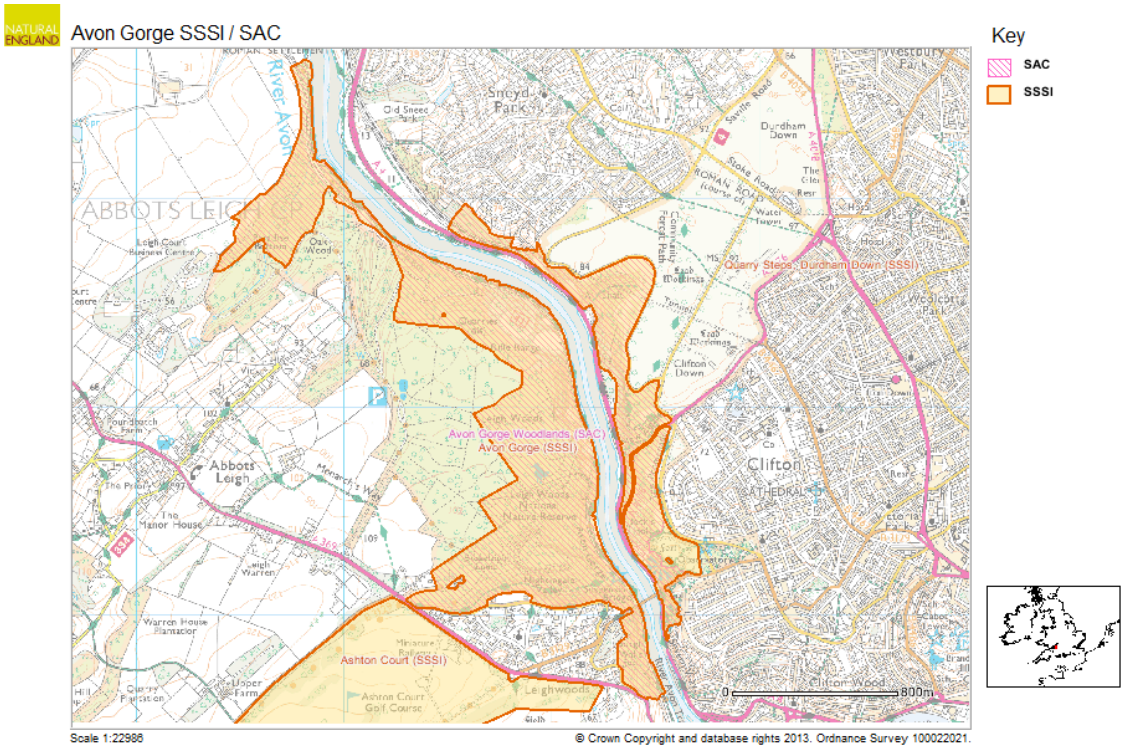
Other habitats include small areas of herb-rich calcareous grassland, patches of Bracken *Pteridium aquilinum* and the strandline saltmarsh along the River Avon.

Geological interest

This site shows the complete local succession of the Carboniferous Limestone. The classic work of Vaughan and Reynolds on the marine fossils of the limestones, and the adoption of the sections as the standard for the 'Avonian' (=Dinantian), makes this one of

Britain's historic geological sites, important for both the study and development of stratigraphy. The section spans (with gaps) the entire Tournaisian and Visean series (Courceyan-Brigantian stages), and also includes the Old Red Sandstone Portishead Beds below. The Avon Gorge affords one of the best opportunities for the study of Carboniferous rocks in Britain, studies which have continued since the early 19th century.

Appendix 3 – Boundary map for the SSSI



Appendix 4 – List of operations requiring Natural England's consent for the SSSI

Operations likely to damage the special interest

Site name: Avon Gorge, Avon

OLD1003073

Ref. No. Type of Operation

1 Cultivation, including ploughing, rotovating, harrowing, and re-seeding.
2 The introduction of grazing and changes in the grazing regime (including type of stock or intensity or seasonal pattern of grazing and cessation of grazing).
3 The introduction of stock feeding and changes in stock feeding practice.
4 Mowing or other methods of cutting vegetation. The introduction of mowing and changes in the mowing or cutting regime (including hay making to silage and cessation).
5 Application of manure, fertilisers and lime.
6 Application of pesticides, including herbicides (weedkillers).
7 Dumping, spreading or discharge of any materials.
8 Burning.
9 The release into the site of any wild, feral or domestic animal*, plant or seed.
10 The killing or removal of any wild animal*, including pest control.
11 The destruction, displacement, removal or cutting of any plant or plant remains, including tree, shrub, herb, hedge, dead or decaying wood, moss, lichen, fungus, leaf-mould and turf.
12 Tree and/or woodland management. The introduction of tree and/or woodland management and changes in tree and/or woodland management including afforestation, planting, clear and selective felling, thinning, coppicing, modification of the stand or underwood, changes in species composition, cessation of management.
13a Drainage (including the use of mole, tile, tunnel or other artificial drains).
13b Modification of the structure of watercourses (eg rivers, streams, springs, ditches, dykes, drains), including their banks and beds, as by re-alignment, re-grading and dredging.
13c Management of aquatic and bank vegetation for drainage purposes.
14 The changing of water levels and tables and water utilisation (including irrigation, storage and abstraction from existing water bodies and through boreholes).
15 Infilling of ditches, dykes, drains, ponds, pools, marshes or pits.
16a The introduction of freshwater fishery production and/or management and changes in freshwater fishery production and/or management including sporting fishing and angling.
17 Reclamation of land from sea, estuary or marsh.
19 Erection of sea defences or coast protection works, including cliff or landslip drainage or stabilisation measures.
20 Extraction of minerals, including peat, sand and gravel, topsoil, subsoil, lime and spoil.
21 Construction, removal or destruction of roads, tracks, walls, fences, hard-stands, banks, ditches or other earthworks, or the laying, maintenance or removal of pipelines and cables, above or below ground.

22 Storage of materials.
23 Erection of permanent or temporary structures or the undertaking of engineering works, including drilling.
24 Modification of natural or man-made features, (including cave entrances), clearance of boulders, large stones, loose rock or scree and battering, buttressing or grading rock-faces and cuttings, infilling of pits and quarries.
26 Use of vehicles or craft likely to damage or disturb features of interest.
27 Recreational or other activities likely to damage features of interest.
28 Game and waterfowl management and hunting practices. Introduction of game or waterfowl management and changes in game and waterfowl management and hunting practice.

* 'animal' includes any mammal, reptile, amphibian, bird, fish or invertebrate.

Appendix 5 – Habitats Regulations Assessment

See separate document for full assessment.

European Designated Site – Avon Gorge Woodlands

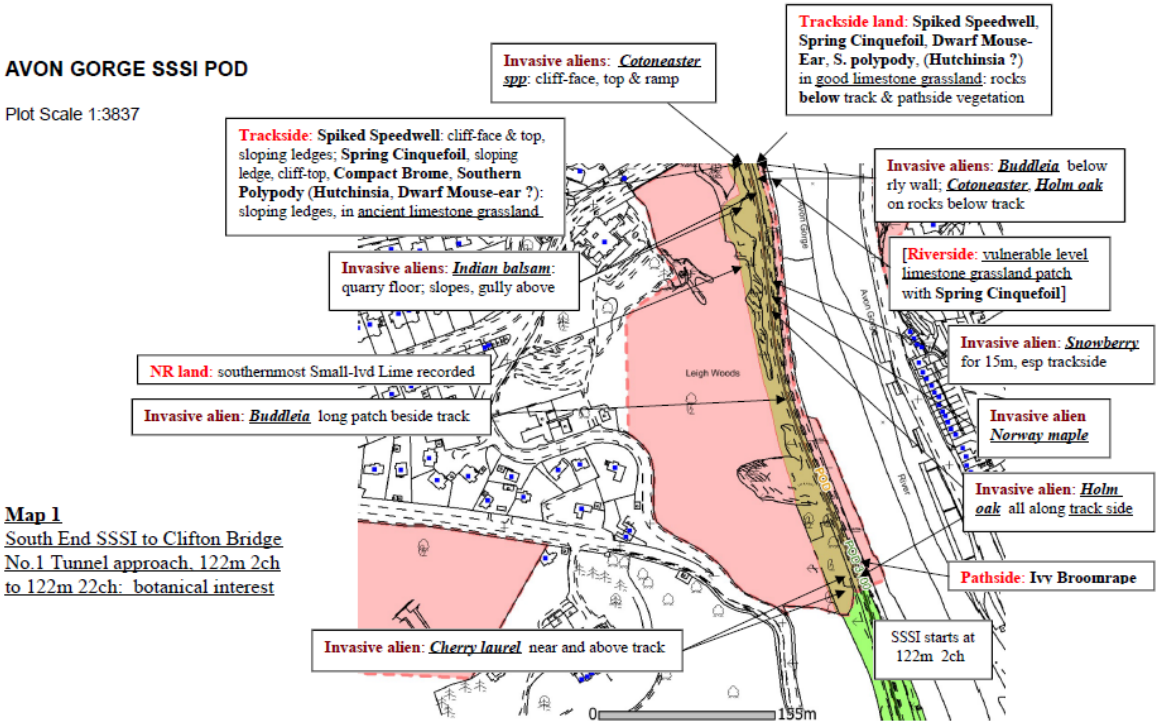
Under the Conservation of Habitats and Species Regulations 2012, Network Rail is responsible for assessing the likely significant effect of work activities on the special interest features of European sites. This assessment by Network Rail is recorded in the table below.

Are the operations connected with the management of the site for conservation reasons?	**No**
Is the work included conducted alone?	**No**
Does the work combine with other permissions, plans or projects?	**No**
Overall conclusion?	**Positive effect with no likely significant negative effect**

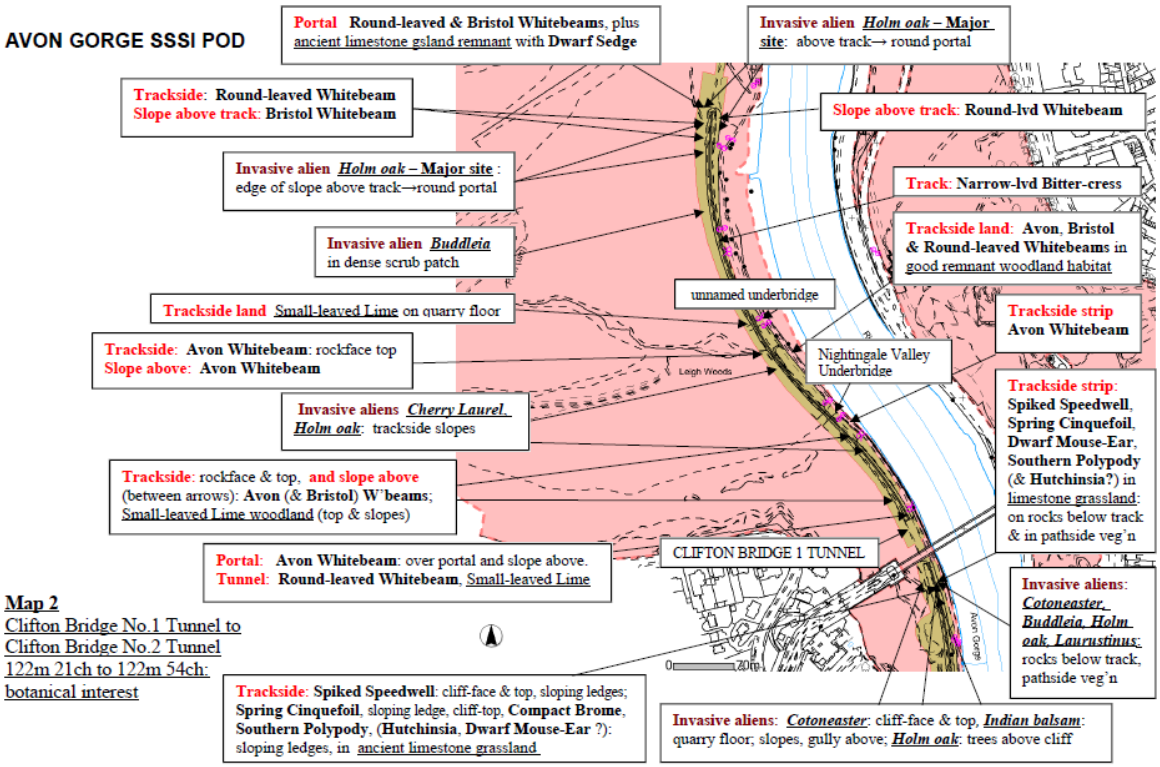
Appendix 6 – Avon Gorge SSSI & SAC Vegetation Management Plan

See separate document

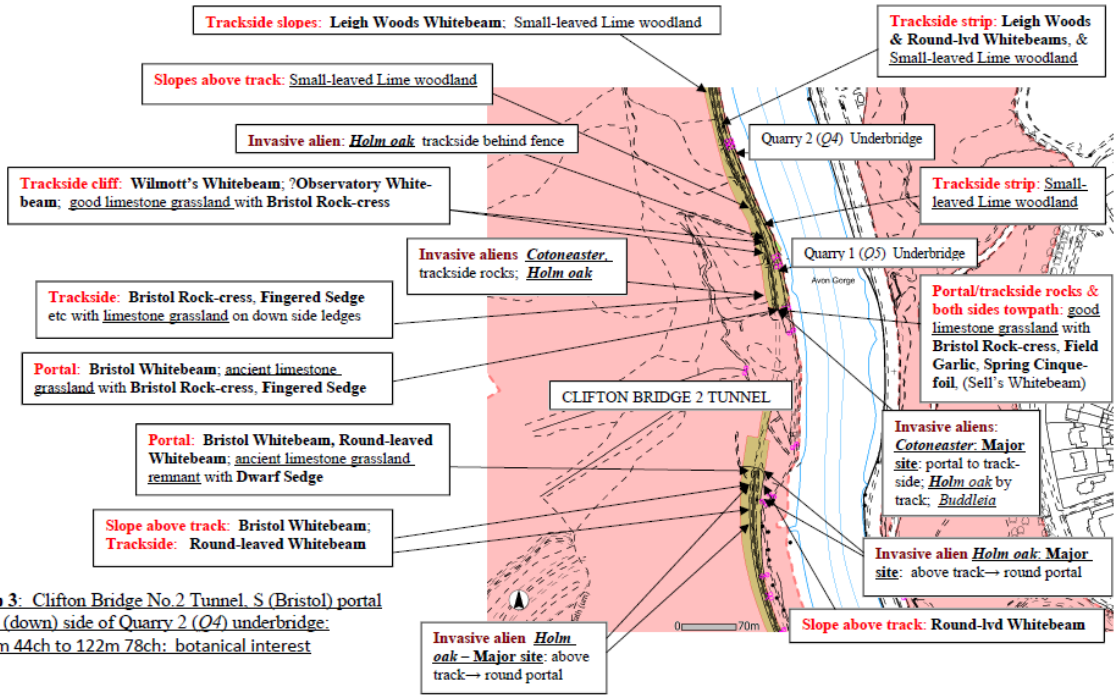
Appendix 7 - Appendix 7 - Ecological Features of Interest within Land under Network Rail Control



Map 1
South End SSSI to Clifton Bridge No.1 Tunnel approach, 122m 2ch to 122m 22ch: botanical interest

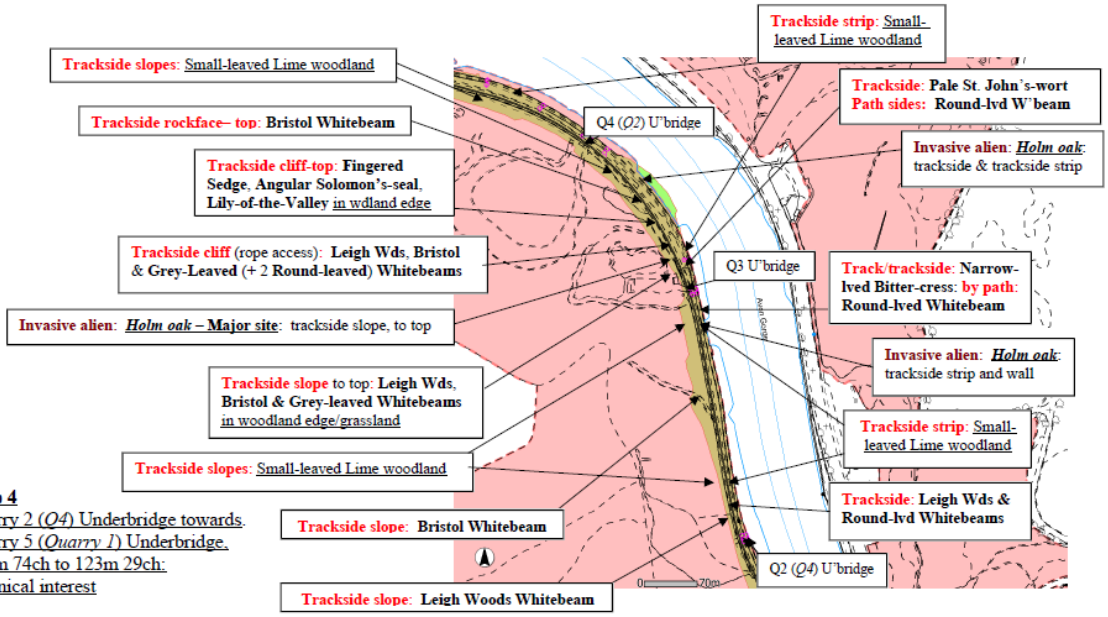


Map 2
Clifton Bridge No.1 Tunnel to Clifton Bridge No.2 Tunnel 122m 21ch to 122m 54ch: botanical interest



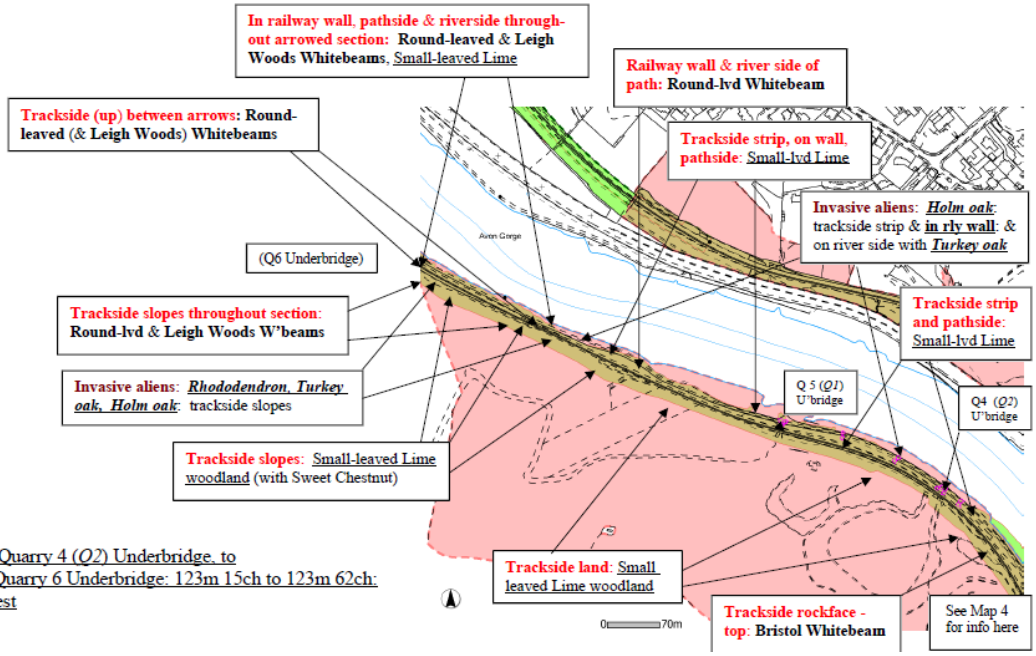
Map 3: Clifton Bridge No.2 Tunnel, S (Bristol) portal to N (down) side of Quarry 2 (*Q4*) underbridge: 122m 44ch to 122m 78ch: botanical interest

AVON GORGE SSSI POD



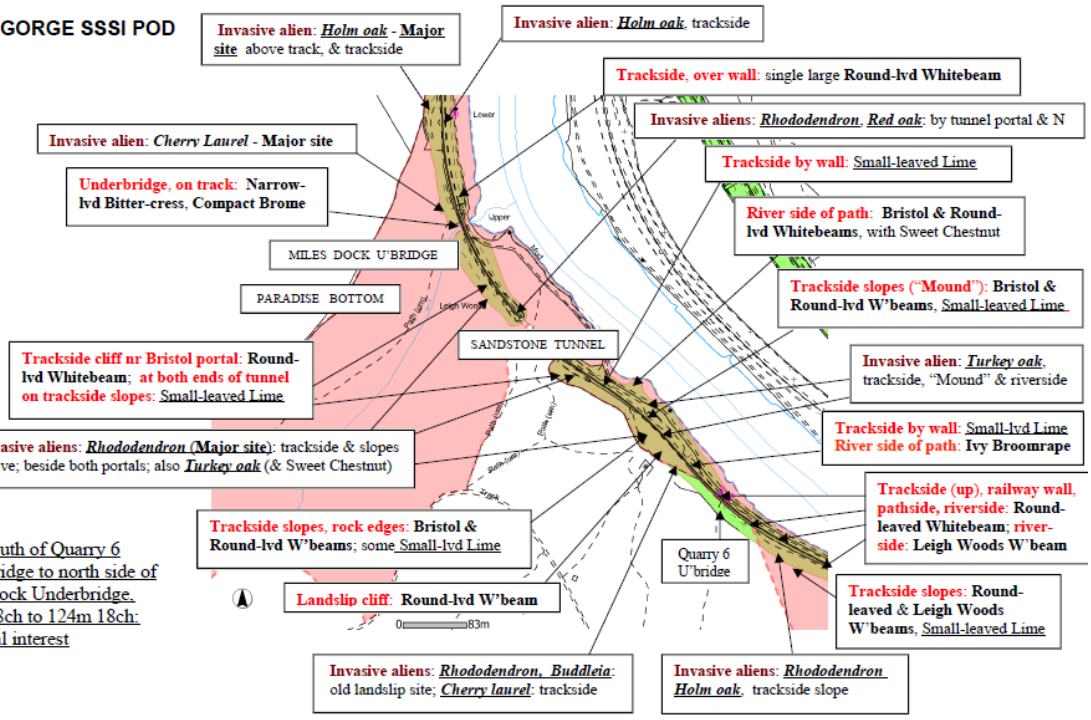
Map 4
Quarry 2 (*Q4*) Underbridge towards. Quarry 5 (*Quarry 1*) Underbridge, 122m 74ch to 123m 29ch: botanical interest

AVON GORGE SSSI POD

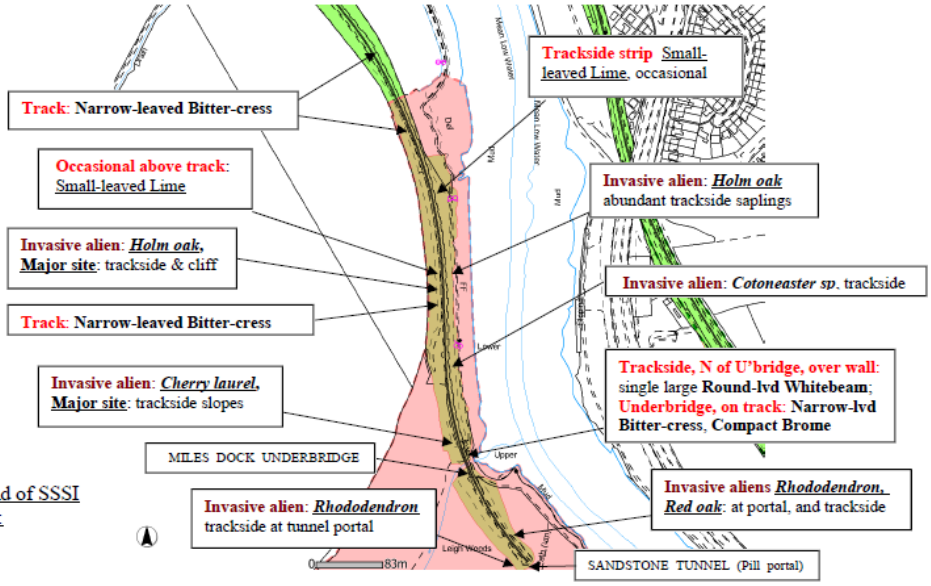


Map 5
(Approach to) Quarry 4 (*Q2*) Underbridge, to (approach to) Quarry 6 Underbridge: 123m 15ch to 123m 62ch: botanical interest

AVON GORGE SSSI POD



Map 6
From south of Quarry 6 Underbridge to north side of Miles Dock Underbridge, 123m 58ch to 124m 18ch: botanical interest



Map 7
Sandstone Tunnel to N end of SSSI
124m 01ch to 124m 34ch:
botanical interest

Appendix 6 - Avon Gorge SSSI & SAC Vegetation Management Plan

CONTENTS

1. INTRODUCTION

1.1 Aims

This document is produced by Network Rail (NR) to assist the Site Management Statement (SMS) for maintenance operations and activities running through the Avon Gorge SSSI & SAC, Portbury Branch line (POD), Bristol (Southerly side). This document is an extension of the SMS and all conditions set out in the SMS shall be applied to this document.

1.2 Objectives

Additional vegetation management options are required, beyond the scope of the SMS, to ensure the safe operation of the railway infrastructure and include the conservation and enhancement of the qualifying features of the Avon Gorge SSSI & SAC. This document is an extension to the scope of NR maintenance works as defined within Sections 3.1 & 3.2 of the SMS.

Opportunities and risks highlighted within this document look at the management of vegetation within Network Rail control as defined by **SMS Appendix 1 - Maps of the Land under Network Rail's Control**.

2. SITE INFORMATION

2.1 Overview

The Avon Gorge is home to a number of protected, rare and scarce plants in addition to native and non-native invasive species. There are many qualifying species that make up the habitats of SAC designated Tilio-Acerion forest and Semi-natural dry grassland and scrubland. Whitebeams (*Sorbus* spp.) have been highlighted as one of the most important notified species of plant within the Gorge but make up only part of a large list of plant and tree species accounting for the biodiversity of the Avon Gorge.

Details of current known plant species inside NR boundary within the Avon Gorge are available in **SMS Appendix 7 - Ecological Features of Interest within Land under Network Rail Control**.

2.2 Description of the Land under Network Rail Control

The POD branch railway corridor runs through sections of woodland with tunnels and cuttings. Rare & protected species grow in soils above or beside the track but may also reside within cracks and crevices of the rock faces which are geological features.

For the majority of the railway through the gorge there is currently a lot of overhanging vegetation above tunnels and on slopes. SAC and SSSI feature species are often surrounded by a variety of native or invasive non-native species (INNS). The competition for light caused by the density of competing vegetation and location on geological features has affected the way some protected species have grown. A proportion of Whitebeams can be seen growing out towards the edge of the track or within it. There is a lot of woody vegetation within 5 meters of the railway which isn't ideal due to the safety risks it poses to the rail infrastructure.

SMS Appendix 1 (Maps of the land under Network Rail's control) shows the boundary of NR owned land. The scope of the works contained within this document is within NR property boundaries but may require engagement with neighbouring land owners where necessary.

2.3 Special Features of the Land under Network Rail Control

The POD line runs through the site of special scientific interest known as Avon Gorge SSSI. Overlapping the SSSI is the Avon Gorge Woodlands SAC. Both protected habitats are home to shared and separate special features that make up their designation. Details of the two habitats can be found in **Portishead Branch Line Preliminary Environmental Information Report (2017).**

Avon Gorge SSSI

Definitions are given in the SMS for the special features of the Avon Gorge SSSI (**SMS Appendix 2 - citation for the SSSI**). These features have been mapped (**SMS Appendix 7 – Ecological Features of Interest within Land under Network Rail control**) through ecology studies and their results are used to consider appropriate measures of vegetation management. A whitebeam survey has been undertaken and all whitebeams have been located and tagged. Details of which are held by NR in document NR Whitebeam Survey POD Avon Gorge SAC SSSI 2015 to 17_14 Aug17.

Avon Gorge Woodland SAC

A Habitat Regulation Assessment (HRA) has been generated (**SMS Appendix 5 – HRA**) to understand the risk of NR maintenance operations on the Avon Gorge Woodland SAC. The SAC's features, including Tilio-Acerion forests of slopes, screes and ravines and Semi-natural grasslands and scrublands should be considered when determining correct vegetation management options.

2.4 Management Zones

In order to prioritise work and ascertain the significance of vegetation management impacts, NR will zone the SSSI / SAC areas that fall inside NR boundary along the POD branch through the Avon Gorge.

Zones are split by physical features separated by tunnels. Figure 1 shows the zones which correspond to **Appendix I – Zonal maps**. Figure 1 also shows the land area and rail locations (marked in miles and chains). A calculation of the biodiversity of each zone will be taken in the first year of the SMS prior to works commencing. To review our progress, biodiversity calculations will be taken in year 4 and at the end of the 5 year SMS period.

Figure 1 – Avon Gorge SSSI / SAC Zones

Zone	Description	Approximate Coverage (acres/hectares)	Location (between)	NE SSSI Unit
1	Start of designation to Clifton Bridge No.1 Tunnel	12,318 / 4985	122.01 > 122.23 m.chn	2
2	Area covered over Clifton Bridge No.1 Tunnel	1,248 / 505	122.23 > 122.26 m.chn	2
3	Area between Clifton bridge No.1 Tunnel 1 and Clifton Bridge No.2 Tunnel	12,134 / 4910	122.26 > 122.52 m.chn	2
4	Area over Clifton Bridge No.2 Tunnel	4,271 / 1728	122.52 > 122.64 m.chn	2, 6
5	Area between Clifton Bridge No.2 Tunnel and Sandstone Tunnel	61,876 / 25040	122.64 > 123.77 m.chn	6, 7, 10
6	Area over Sandstone Tunnel	1,915 / 775	123.77 > 124.02 m.chn	10
7	Area from Sandstone Tunnel to end of designation	21,286 / 8614	124.02 > 124.30 m.chn	10

The total approximate area of land under management of Network Rail running through the protected areas of the SSSI and SAC notifications is 11.5 hectares.

3. VEGETATION MANAGEMENT

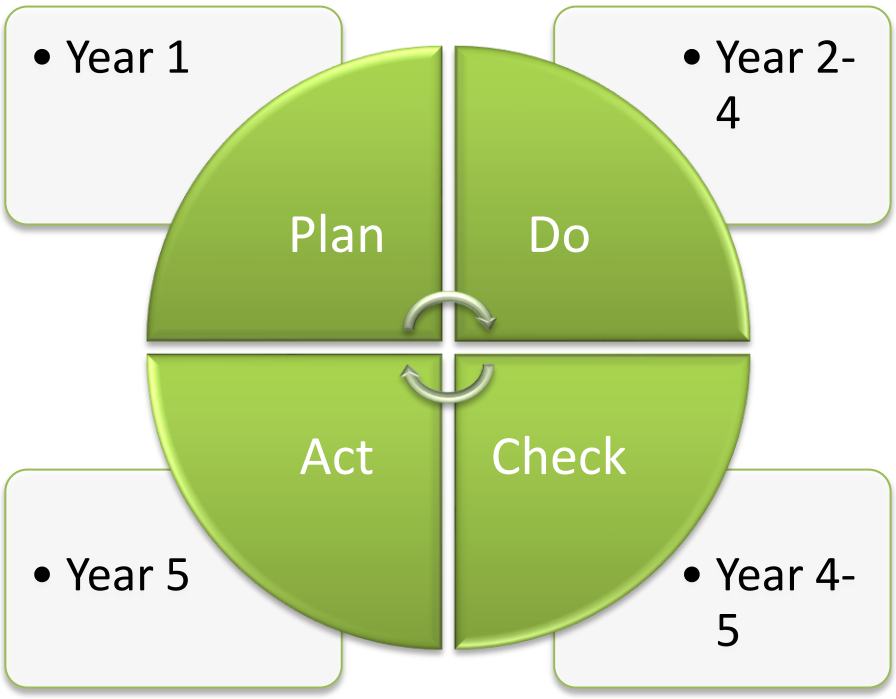
Routine Maintenance operations are those set out in Section 3.1 of the SMS which requires Network Rail to manage Network Rail's land to permit the safe and easy passage of trains through the site.

Maintenance of lineside vegetation is carried out in accordance to Network Rail standards and requires there to be no woody vegetation within and overhanging 3 metres of the rail. Where this might be appropriate for the vast majority of land under NR ownership there are many factors that make this approach unreasonable in the Avon Gorge. Special considerations should be taken to review the National and International importance of species and habitat features of the SSSI and SAC. It is therefore more appropriate for a bespoke method of managing the vegetation. One that enhances the biodiversity and qualifying features of the gorge without compromising on safety or structural integrity on the rail infrastructure.

3.1 Maintenance Plan

Managing the vegetation within the Avon Gorge will take place over a 5 year period and will be designed to restore the areas designated features. Over 5 years work can be planned, completed, monitored and reviewed (also known as the Plan, Do, Check, Act approach to environment management). Figure 2 below shows how this process will be set out over time.

Figure2 - Vegetation management 5 year plan



Determination of work

NR will conduct different maintenance activities over five years to restore the qualifying features of the SSSI & SAC as well as making the railway safe for trains. A breakdown of the annual activities will include;

Year 1 - Plan:

- Locate and manage primary lineside safety critical species[1] of plants and trees
    - Dead, diseased or dangerous (DDD) (include trees with risk for causing root jacking)
- Routine maintenance of species encroaching on passing trains and/or pose a risk to safety or infrastructure - Options include, thinning, lifting, pollarding & limb reduction
- Accumulate surveyed data to provide a report on the qualifying features and risks held in each zone. Report can be used for monitoring progress over the 5 years.
    - Measure the current biodiversity of the Avon Gorge using the Network Rail biodiversity calculator tool.
    - Photograph the zones for visual monitoring
    - Apply data from ecology reports (whitebeams & other feature species, INNS, Areas covered by grassland, primary & secondary woodland)
    - Apply data from known DDD trees
- Using data collated above, develop the vegetation management work bank for years 2-4, prioritising zones which require more work to develop the qualifying features. Work to include:
    - Management of INNS
    - Management of secondary lineside safety critical species of plant and trees[2]
    - Restoration of SAC Limestone grasslands features

Year 2-4 - Do:

- Removal of Invasive non-native species
- Management of secondary safety critical species and trees which impact on the safety of the railway
- Management of Limestone grassland features (low impact hand held tools used to simulate grazing – loppers, sheers, strimmer)
    - Possible use of volunteers in easy access areas.
- Management of species growing out from the track bed

[1] Primary safety critical species are those which possesses a severe/immediate likelihood of falling or encroaching on the track and or undermining the geology of the infrastructure and impacting on the service of passing trains, safety of staff and members of the public. Examples include DDD plants and trees.

[2] Secondary safety critical species are those which pose a future threat from falling or encroaching on the track and or undermining the geology of the infrastructure and impacting on the service of passing trains, safety of staff and members of the public. They are not an immediate risk but a known risk that requires attention in time. Examples include DDD trees.

- Continued routine maintenance of species encroaching on passing trains and or pose a risk to safety or infrastructure
- Management of trees and scrub above tunnel portals.
- Scope the feasibility for erecting fencing to improve safety, security and vandalism issues.
- Scrub cutting adjacent to the tow path directly beneath the Clifton Suspension Bridge

Year 4-5 - Check:

- Monitoring of year 1-4 impacts. Update of report generated in year 1
- Planning for additional management of plant species within boundary
- Continued routine maintenance of species encroaching on passing trains and or pose a risk to safety or infrastructure

Year 5 - Act:

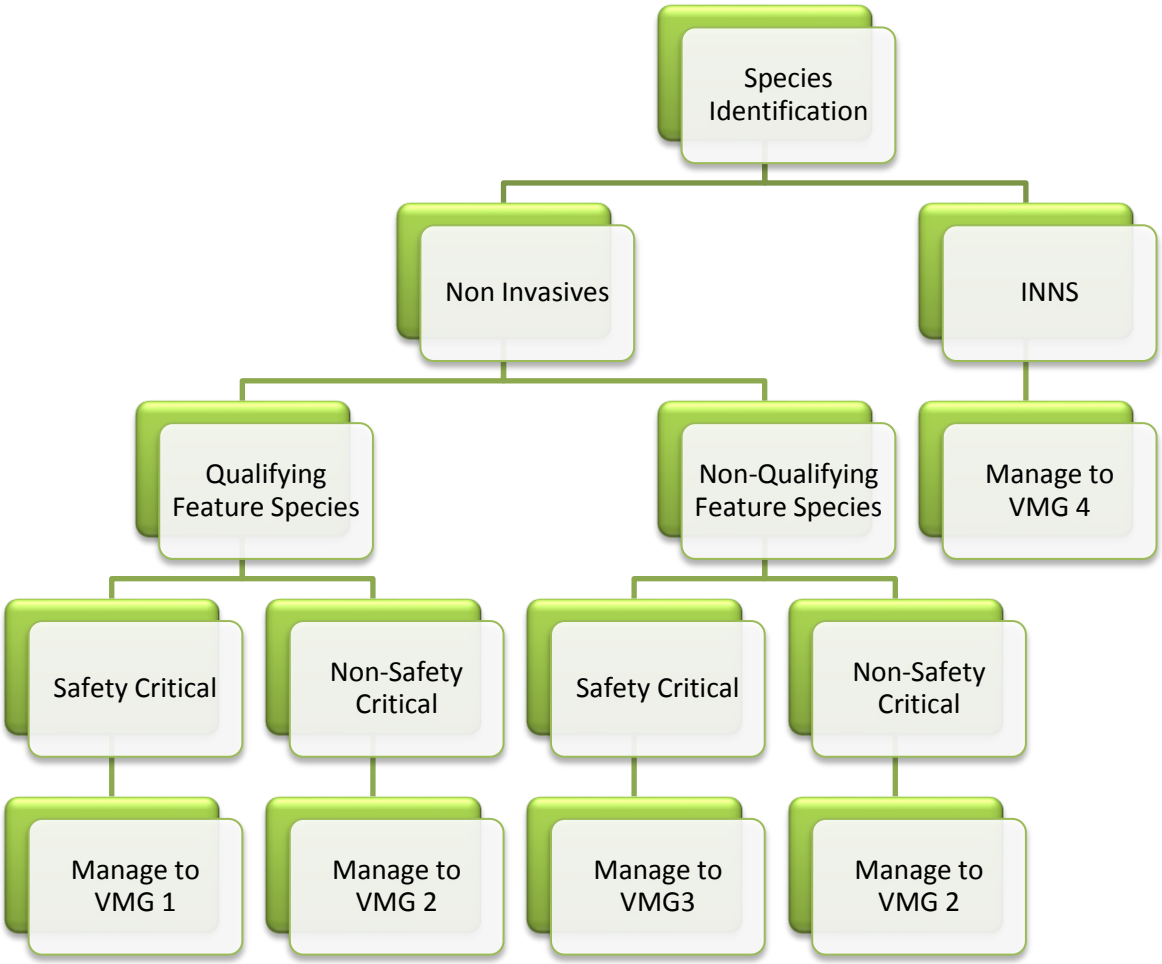
- Continued routine maintenance of species encroaching on passing trains and or pose a risk to safety or infrastructure
- Review and consultation for a new SMS which would likely see the continuation of routine maintenance as the majority of restorative work has been completed.

3.2 Vegetation Management Guidance

In planning for vegetation works there are a number of factors that need to be accounted for. Planning will be split into zones and work will be prioritised based on the botanical/biodiversity needs of the zone, i.e. dependant on the safety risks, invasive species and qualifying habitats and species present.

Vegetation management will look at the invasive species, hazardous plants/trees and qualifying habitats and species. Deciding on the right course of vegetation management will depend on these aspects. Vegetation management guidance (VMG) has been created to inform maintenance planning teams on the type of vegetation management required to control the species. There are four categories as exhibited in Figure 3.

Figure 3 – Vegetation Management Activity Process Chart



VMG 1

Bespoke management of these species would be required. Where possible opportunities to avoid felling should be pursued. Such an approach would include controlling limb growth within 3m of track or coppicing to promote regeneration and continuation of the plant species (if the species would survive). Where no opportunity can be located then felling could be a last resort. Under section 3.1 of the SMS, removal of any of these categorised species would require consent from NE, other than in an emergency situation.

VMG 2

Predominantly these species will be left alone to improve the overall biodiversity of the gorge as it is acknowledged that species outside the qualifying species still provide a wider habitat for other species of flora and fauna. However, if it is advantageous to manage to enhance the qualifying features of the SAC or SSSI then we could consider coppicing, pollarding, limb reduction or thinning (non-qualifying feature species specifically). Felling only for non-qualifying species.

VMG 3

The first method for management would be to remove and plug the stump with herbicide to stop it from growing back. If removal could cause harm to other qualifying species or carry safety implications then limb reduction or pollarding could be done to ensure safety to the infrastructure and or immediate species surrounding.

VMG 4

These are invasive non-native species and therefore have no significance to the qualifying features of the Gorge other than negatively competing for light and water. They provide a seed bank that can spread to neighbouring stakeholders. Safety critical species will be felled and treated to prevent regrowth. Non safety critical INNS will be added to a workbank for removal where possible.

3.3 Vegetation Management Techniques

Vegetation management techniques as advised in section 3.2 includes the following options (where applicable);

Technique	Example
Felling (including thinning)	Non-native or invasive trees casting a shadow over protected species
Pollarding	Tree branches reaching over the 3m cess
Coppicing	Trees which might cause a risk to the rail but are qualifying feature species and flourish from coppicing management (i.e. hazel)
Pruning	Pruning overhanging scrub and trees within the 3m. Good choice for protected species which require further vegetation management in future (short term resolve).
Use of pesticides (e.g. stump treatment, weed killing)	Once a non-qualifying tree has been felled. Stump treatment will ensure is does not grow back
Translocation / Propagation	Possible choice for removal of rare Whitebeams in hazardous locations along the railway, i.e. above tunnel portals or where root jacking risk is present
Management of tree canopy above an individual plant	Haloing to encourage light and growth on forest floor.
Hand Tools & Strimmer's	On grasslands – mimics activities of grazing animals to keep grass low and halter growth of scrub. The best period to cut grasslands is the end of September or winter as it promotes growth for perennials.

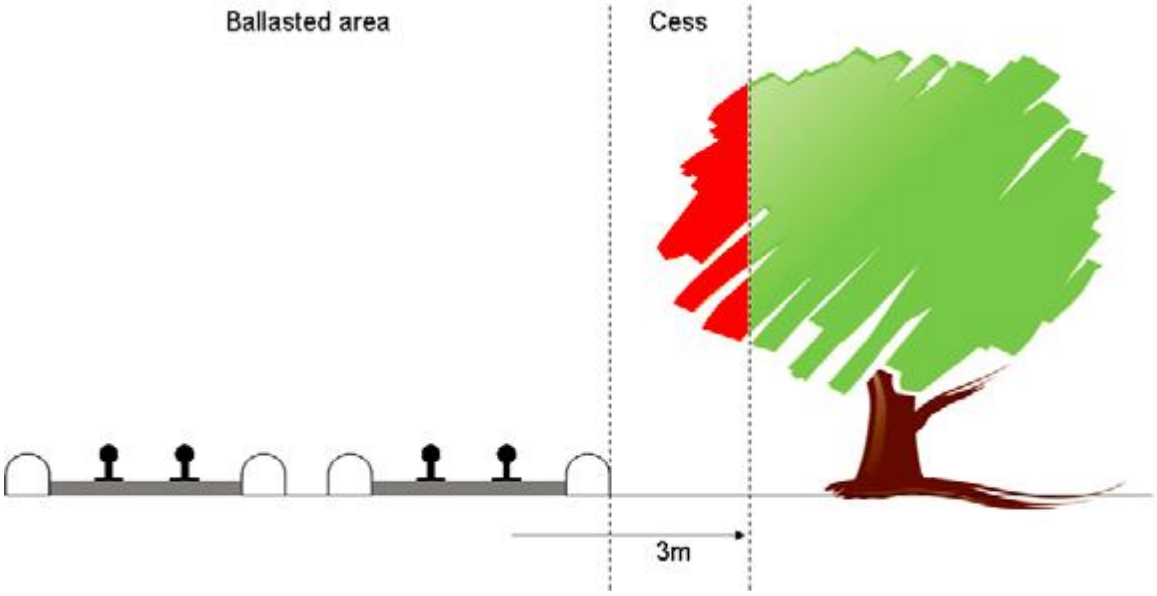
It might be possible to use one or more combinations of management options when determining how to carry out vegetation maintenance. Vegetation management might take a number of years and may require variable options over time.

3.4 Standards for Managing Vegetation

Maintenance of vegetation will be carried out in accordance to NR standards, processes/procedures and third party agreements. Where management is planned it will be undertaken to a set of standards, including;

- Safety of staff, public, trains and infrastructure to be the main priority.
- A maintenance programme ensures there to be no significant risk to the structural integrity of the infrastructure or obstruction to infrastructure and those who require access to carry out maintenance activities and observations.
- Continued protection and conservation of protected species and qualifying SAC / SSSI features
- Maintenance operations should be developed to enhance the qualifying SAC / SSSI features (where possible)

Figure 4 – Lineside Vegetation Management Distances



- The ballasted area shall be maintained clear of all woody vegetation and 95% clear of other vegetation. The area vertically above this shall also be maintained clear of all vegetation encroaching from other areas as shown in Figure 4.
- The cess (3 metres from line) shall be maintained clear of all woody vegetation. The area vertically above this shall also be maintained clear of all vegetation as shown in Figure 4.
- Boundary vegetation maintained in excess of 3 metres from the line shall be maintained to reduce risk to the railway and third parties. Vegetation shall be maintained at a height such that it cannot fall foul of the line or reduce sighting distances to an unacceptable level. No DDD woody vegetation allowed within 5 meters from the running rail.
- At tunnel portals all woody vegetation shall be removed to a distance of at least 1 metre beyond the top of the cutting.
- Hazardous trees are identified by NR risk assessment forms

- Operations shall be planned such that the risk of windthrow is not increased following felling. Windthrow could impact rail infrastructure and woodlands within adjacent landowner boundaries and also impact protected species.
- Network Rail carries out vegetation management to minimise the impacts of leaf fall on the line, in accordance to company standards.
- Vegetation on all slopes shall be maintained such that its removal does not compromise the stability of the slope

3.5 Arisings

Managing the vegetation will produce arising's. A well-managed and healthy woodland habitat should contain a variety of plant species of age, size and decay. Dead wood/plants provide nutrients and CO^2 to soils to plants, bacteria, animals and bugs. Managed correctly, arising's can replicate dead wood/plants and replicate nature balance of growth. However, arisings can cause enriched soil and promote weed growth, therefore, each feature should be looked at separately as below. The removal of arising along the Avon Gorge is expected to be significant due to restrictions of access and will therefore contribute as the majority of the cost for site management. For this reason a reasonable approach to their removal should be found.

Semi natural dry Grassland:

No timber or arising's to be left on site. Small quantities of cut grass can remain on site to decay. Large grass and scrub should be raked and removed from site or piled into an edge of scrubland (of no significant value).

Tilio-Acerian Forest:

INNS - No timber or arising's to be left on site so as to remove seed sources and natural regeneration.

A pragmatic approach to arising's from qualifying and non-qualifying species (but not INNS) should be sought;

Felled trees – Where possible these should be removed from site. Timber more than 200mm thick may be left on site so long as it doesn't obstruct light for qualifying species or smother other species or pose a risk to their stability. Timber cannot be chipped and left on site, it must be left as is or cut to facilitate decay. Brash from felled trees should be removed from site.

Brash - From trees, created through limb reduction or lifting should be removed from site. Where trees have been coppiced it would be suggested that a small percentage of brash remain on site. This would provide a food source for local deer to deter them from eating shoots of new growth.

Any timber left on site must be safely stored so that it cannot slip and pose a risk to the railway, staff or public or protected species.

If arising's cannot be removed immediately, they must be stored in a position of safety along the track or in an area of clearance (preferably areas of secondary woodland) which does not impact on any protected species. Arising's must be removed as soon as possible.

4.0 MEASURING SUCCESS

The outcomes of the aforementioned vegetation management are to enhance the qualifying features of the SAC and SSSI. What is hoped to be achieved on site is the,

- Reduction of cover and abundance (and ideally eradication) of INNS and seed source which is spreading to and from NR land and impacting on the wider SAC/SSSI habitat.
- Opening of the canopy to allow more light to enter and allow lower canopy species and ground level species enough light to compete.
- Remove scrub and competing species from grasslands to ensure biodiversity remains high but the qualifying species are given opportunity to flourish
- Removal of canopy around the track edges to allow whitebeams the opportunity to grow up, away from the track. This ensures their encroachment doesn't mean we have to intervene and manage them.
- Provide more favourable conditions for the succession of whitebeam evolution that is currently being witnessed.
- Net positive biodiversity across the SAC/SSSI designated area of the Avon Gorge under Network Rail control.

Success will be measured through a net positive outcome by the end of 5 years. Moreover, the aspiration is to improve upon the SSSI designated condition and condition threat risk determined by Natural England. Currently units 2, 6, 7, & 10 are unfavourable recovering and high threat risk. NR will aim to be at minimum Unfavourable recovering & low threat risk.

5. TIMEFRAME

The SMS to which this document is a continuation of, is valid for 5 years (from the start of implementation). The five years has been split between planning work, carrying out vegetation management, monitoring and planning further works (plan, do, check, act), as stated in section 3.1.

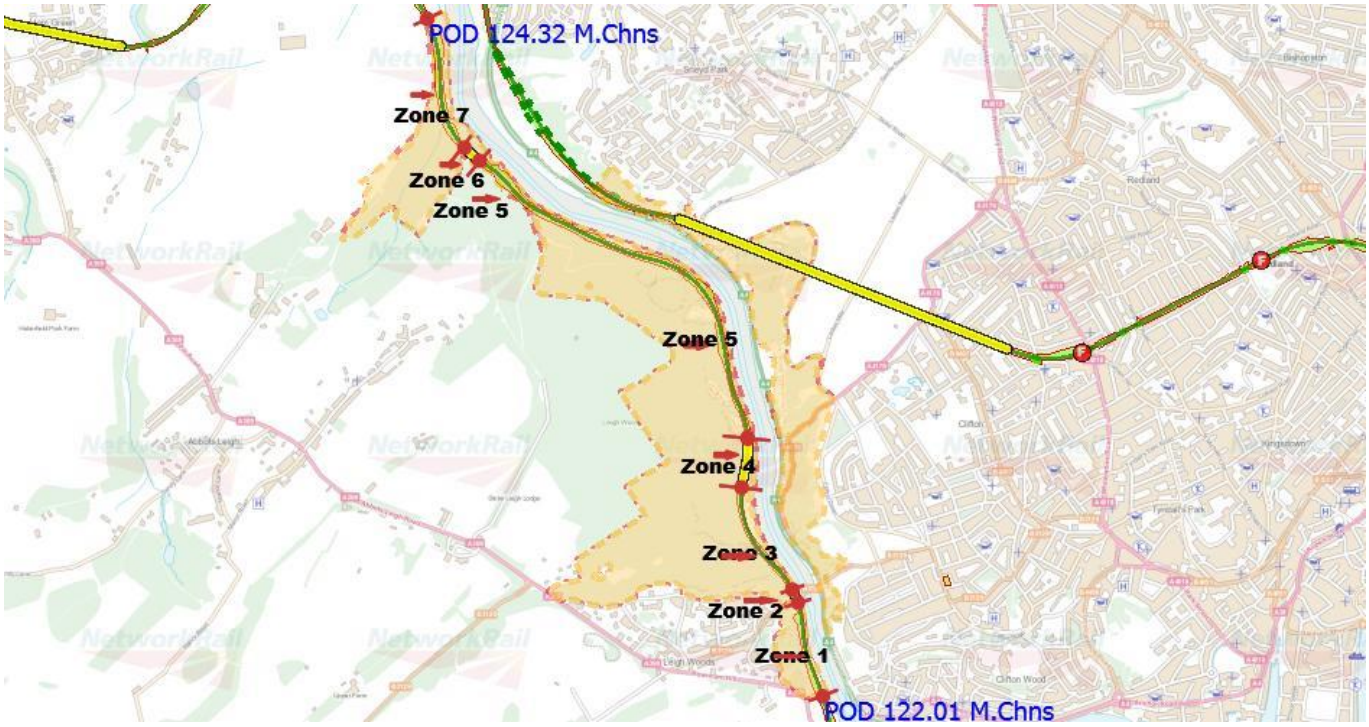
The SMS has been designed alongside the proposed development of the MetroWest Project 1 which has an intended completion date of 2021/2022. MetroWest have their own management plan for their activities which it intends to complete around year 4/5 of this SMS. After completion of the actions set out in this SMS and the activities of MetroWest Project 1, NR will reassess its activities to develop a new SMS.

Upon completion of this SMS which looks solely on the Southerly side of the Avon Gorge along the POD line, NR will look to implement an SMS for the Northerly side along the CNX line.

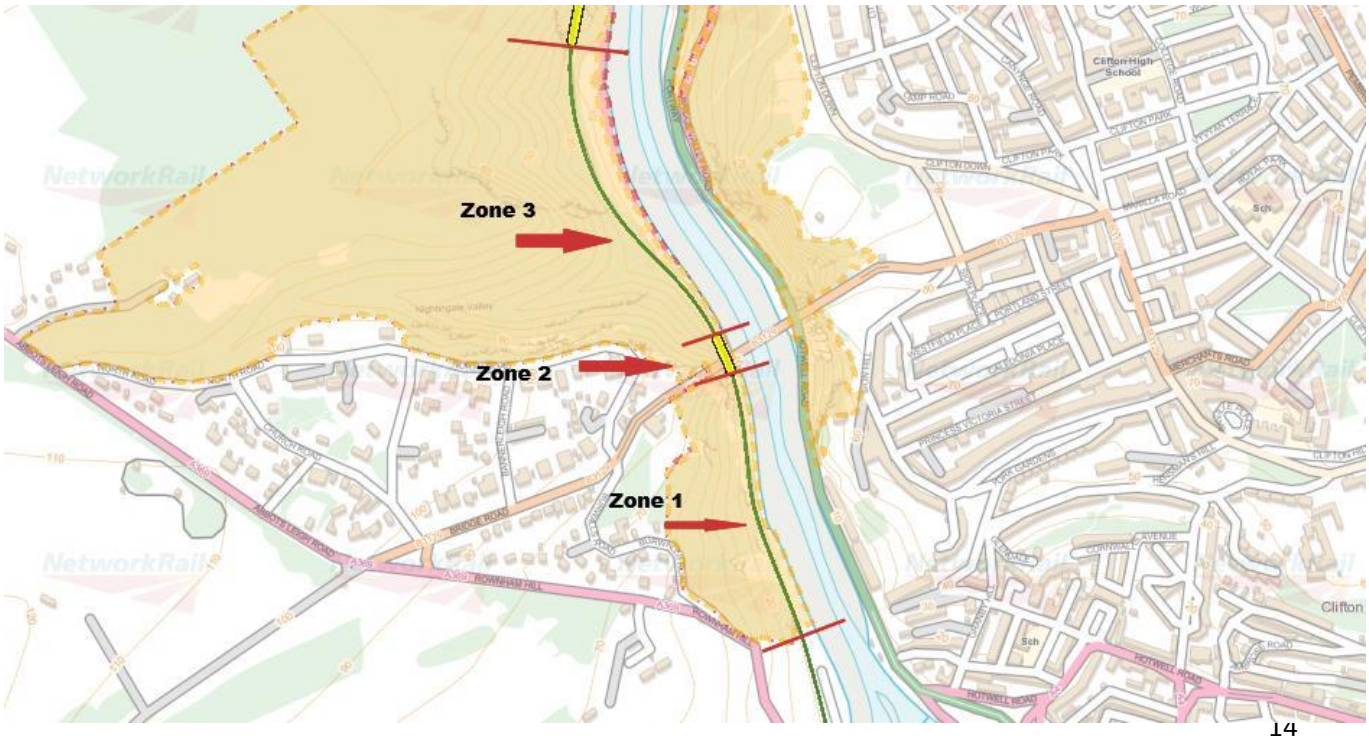
APPENDICES

Appendix I – Zonal Maps

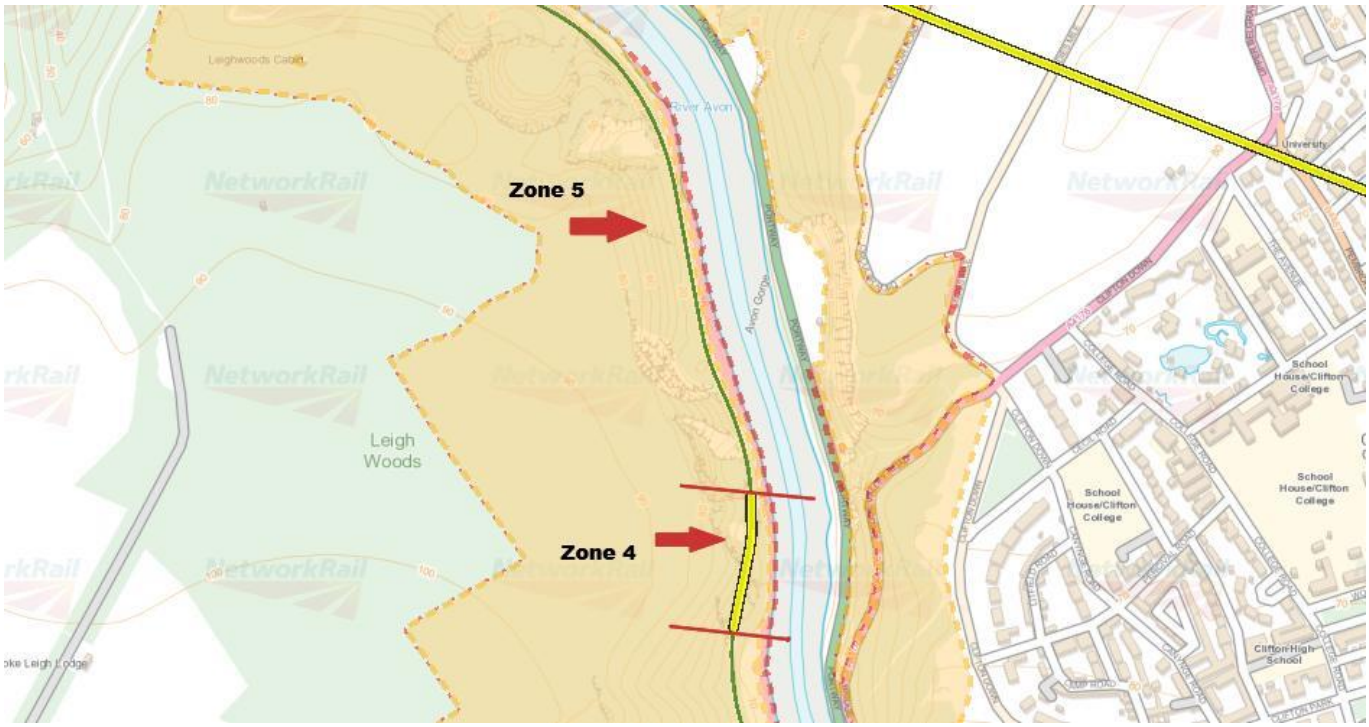
Map 1 – Overview of AG zones



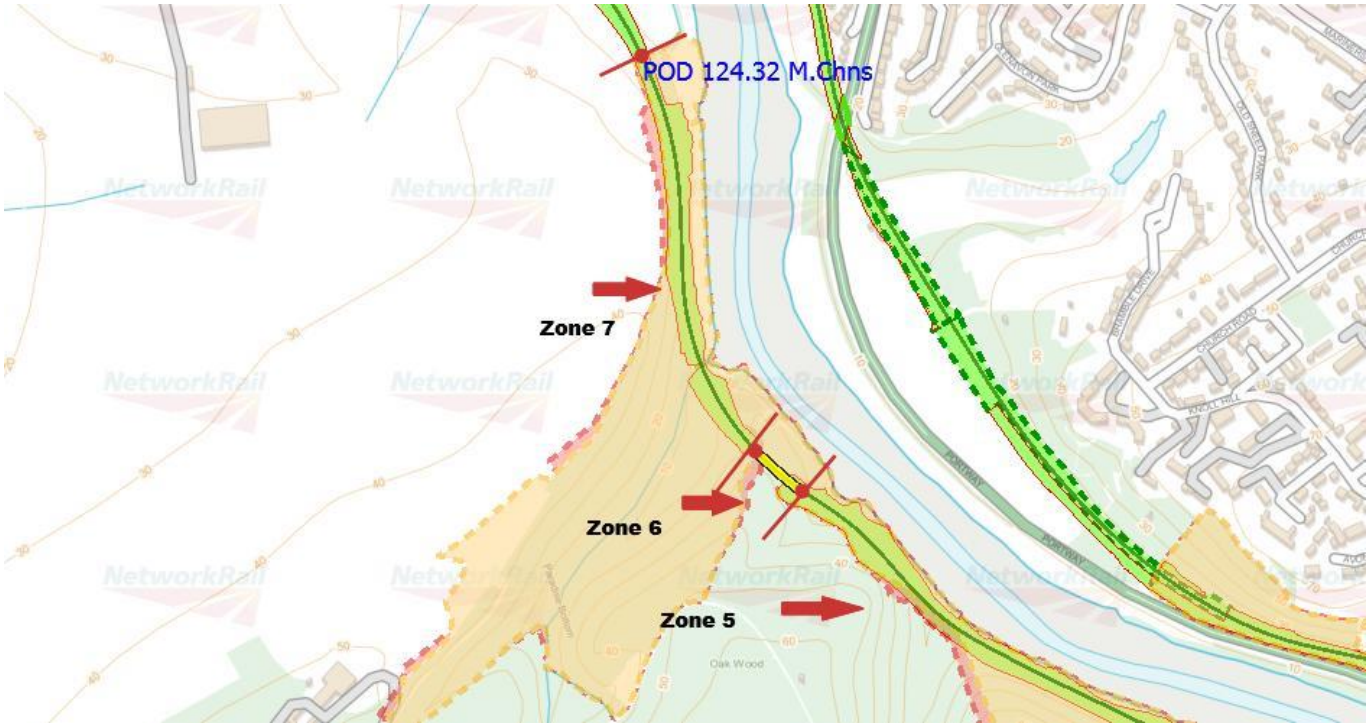
Map 2 – Zones 1-3



Map 3 – Zones 3-5



Map 4 – Zones 5-7



Network Rail Habitats Regulations Assessment for the Avon Gorge

Site Name	**Avon Gorge Woodlands**	**EU Site Code Ref.**	**UK0012734**
Affiliated Documents	**Site Management Statement for Network Rail: Avon Gorge SSSI and SAC**		
Route	**Western**		
DU	**Bristol**		
Assessment made by:	**Christopher Gaylard**	**Date:**	**26 March 2018**
Role:	**Environment Specialist**		
European Site(s):	**Avon Gorge Woodland (SAC)**		
Component SSSI(s):	**Avon Gorge (SSSI)**		

- -----------------

Assessment Contents:

Assessment Summary

The Site Management Statement provides assent for Network Rail to carry out routine maintenance activities to permit the safe passage of trains.

This HRA assesses the likely impacts of routine maintenance activities on the designated features of the Avon Gorge Woodlands SAC

Works to clear or control the spread of scrub and invasive vegetation along the line will generally be of benefit to the designated features of the SAC.

PART A – Introduction and Information

A1. Introduction

This is a record of the Habitats Regulations Assessment undertaken by Network Rail in its role of competent authority.

The application requires Network Rail as a statutory undertaker to assess the impact of routine maintenance operations set out in the Site Management Statement & Vegetation Management Plan (known also as the plan) which could have an impact on the SAC.

A2. Details of the plan for routine maintenance

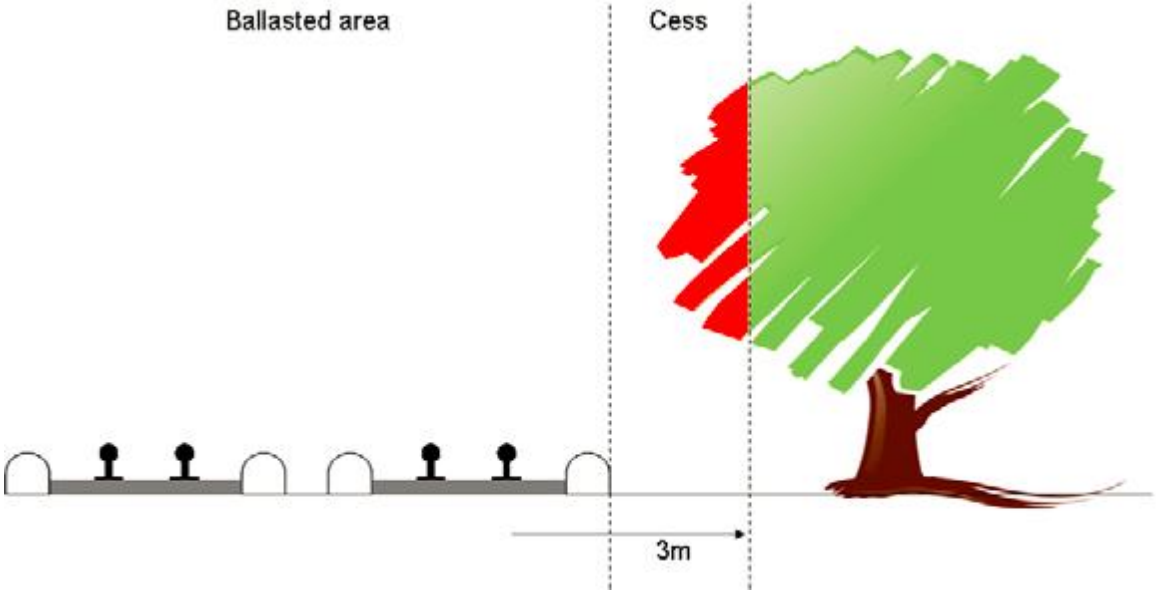
Type of application: HRA to assess the impact of routine maintenance operation on the Avon Gorge SSSI, which is part of the Avon Gorge SAC

Location (including grid references): Avon Gorge Woodland, Bristol. Please refer to attached maps in **Appendix I**

Description of routine maintenance:

- To permit the safe and easy passage of trains through the site.
- Vegetation shall be maintained as specified below in Figure 1:

Figure 1 – Lineside Vegetation Management Distances



- The ballasted area shall be maintained clear of all woody vegetation. The area vertically above this shall also be maintained clear of all vegetation encroaching from other areas as shown in Figure 1.
- The cess (3 meters from line) shall be maintained clear of all woody vegetation. The area vertically above this shall also be maintained clear of all vegetation
- Maintain drainage so that it performs as designed to support the safe operation of the railway.
- Manage trees and vegetation beyond 3m of the line when and where required for the safe operation of the railway, taking account of the SAC and SSSI features and

ensuring that they are not negatively affected by these actions. Efforts must first be made to find alternative methods of tree management (beyond felling) where a protected species is highlighted as a risk (DDD). For all of the above, if the tree is a rare species or qualifying species of the SSSI or SAC, consent from Natural England is required, except in emergency situations. Care should be taken when undergoing tree felling and rare species must not be disturbed (unless in emergency situations) without prior consent from Natural England.

- Management of arising's as set out in the vegetation management plan based on SAC feature and species. Removal of all INNS arising's.
- Network Rail will inform Natural England of any emergency works undertaken within the SSSI as soon as practical (Emergency works is not to be used as an excuse for planned work nor for using the SSSI to facilitate access for engineering work for which there is a reasonable option, albeit more costly in terms of resources, time etc.)
- Pesticide application within agreed weedspray restrictions. If application is by spraying within the SSSI boundary then it is only permitted as spot spraying with a knapsack sprayer fitted with a suitable nozzle to minimize any spray drift or by the use of a weedwiper when height differential is sufficient and ground conditions allow.
- Infrastructure renewal – major planned works beyond infrastructure maintenance will need consent from Natural England particularly if it involves vegetation management.
- A proposed action plan for the management of vegetation through the designated SSSI & SAC area on the southerly section of the Avon Gorge under Network Rail control. This plan is set out in **Appendix 6 – Avon Gorge SSSI & SAC Vegetation Management Plan**. This plan includes activities highlighted under routine vegetation management and those activities set out to enhance the qualifying features over the 5 year period of this SMS. Routine vegetation maintenance will be carried out in accordance with specifications controlled by Network Rail Management of Lineside Vegetation standards, where there is no impact on rare or protected species. Where vegetation management may impact on rare or protected species (as defined in **Appendix 2 – Citation for SSSI**) a decision on the best vegetation management options will be reviewed, in accordance with the site Vegetation Management Plan.
- Pest control of burrowing fauna, which may be potentially destabilizing to the rail bank (such as rabbits, mink and rats).
- Maintenance of Network Rail boundary fencing – major planned works beyond infrastructure maintenance will need consent from Natural England particularly if it involves vegetation management.
- The eradication of plant species, listed in Schedule 9, Part II of the Wildlife and Countryside Act 1981 and the Weeds Act 1959 will be a priority.
- Removal of introduced or invasive species on both sides of the gorge e.g holm oak, *Cotoneaster* species (*spp.*) etc. will be a secondary but important priority. Programme and techniques will be agreed with Natural England following the ecology survey.

  Where consent is required for any additional operation as mentioned above, Network Rail will submit to Natural England a SSSI notice of proposed action form.

PART B: Information about the European Site(s)

B1. Brief description of the European Sites (SAC) and their Qualifying Features

See **Appendix I** (Map of Avon Gorge Woodland SAC & key features) for SAC features within the Avon Gorge & Network Rail boundary.

Annex I habitats that are a primary reason for selection of this site

9180 Tilio-Acerion forests of slopes, screes and ravines * Priority feature

Avon Gorge is representative of ***Tilio-Acerion*** **forests** in south-west England on the limestone cliffs and screes of a large river gorge. It is important because of the high concentration of small-leaved lime *Tilia cordata*, compared with other sites in the region, the presence of rare whitebeams *Sorbus* spp., including two unique to the Avon Gorge (*S. bristoliensis* and *S. wilmottiana*), and other uncommon plants, such as green hellebore *Helleborus viridis*. Other characteristic species include soft shield-fern *Polystichum setiferum* and hart's-tongue *Phyllitis scolopendrium*. Species-rich transitions to scrub and grasslands are associated with the woodland. Small groves of yew *Taxus baccata* also occur on some of the stonier situations.

Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site

6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (*important orchid sites)

Festuco-Brometalia grasslands are found on thin, well-drained, lime-rich soils associated with chalk and limestone. They occur predominantly at low to moderate altitudes in England and Wales, extending locally into upland areas in northern England, Scotland and Northern Ireland. Most of these calcareous grasslands are maintained by grazing. A large number of rare plants are associated with this habitat, including purple milk-vetch *Astragalus danicus*, dwarf sedge *Carex humilis*, spotted cat's-ear *Hypochaeris maculata*, spring cinquefoil *Potentilla tabernaemontani*, pasqueflower *Pulsatilla vulgaris*, bastard-toadflax *Thesium humifusum* and the Annex II species **1654 early gentian *Gentianella anglica***, as well as various bryophytes and lichens. The invertebrate fauna is also noteworthy, and includes rarities such as the adonis blue *Lysandra bellargus* and silver-spotted skipper *Hesperia comma*.

B2. SAC features on Network Rail land

Appendix II (Map of NR boundary within SAC) highlights the boundary of Network Rail property shown within the boundary of the Avon Gorge Woodland SAC.

Network Rail has a series of ecology and botany surveys covering land occupied by Network Rail. Surveys include:

- A detailed record of Whitebeam species
- A survey of dead, dangerous and diseased trees
- A survey including whitebeam, native and invesaive species of plant and trees
- Map of SAC features – grassland, primary & secondary ancient woodland

PART C: Likelihood of significant effects

There are two screening stage tests required under Regulations 24 & 63 of The Conservation of Habitats and Species Regulations 2017.

C1. Connection with or necessary to the management of the site

The routine maintenance operations noted in Part A set out the activities undertaken by Network Rail to carry out its duty to maintain the rail infrastructure and assets. This must be done to allow the safe passage of trains and provide a safe environment to employees and the public.

The SMS and HRA do not sit as a stand-alone document for the management of the SAC & SSSI features. Its primary focus is to outline activities (routine maintenance) given assent to Network Rail to carry out its statutory duties to the rail infrastructure. The Avon Gorge has received little vegetation maintenance since its reinstatement in 2001 as a freight only line. This has impacted on the SAC features and safety of the land/asset within NR ownership. A secondary remit of the SMS and HRA is to set out a plan to improve the qualifying conditions of the designation through additional much needed maintenance operations.

Maintenance activities to impact on the SAC include:

- Removal or stabilisation of DDD trees (dead, dying or diseased)
- Removal of invasive non-native species
- Scrub clearance
- Herbicide spraying

Tilio-Acerion forests and Semi-natural dry grasslands and scrubland habitats may be improved as a result of routine maintenance works. Management of large shadowing trees and plants or INNS would provide favourable conditions for small plants and qualifying species (Whitebeams, Lime, Fern, Hart's-tongue etc.) to compete and potentially flourish.

C2. Test: Likelihood of significant effects (LSE)

C2.1 Alone

This section details how those constituent elements of routine maintenance, which are not considered necessary for or directly connected with the management of the site, may have a likely significant effect on their own.

Maintenance Activity	Qualifying feature likely to be affected	Mechanism / pathway of effect	Likely significant effect - Positive / Negative / None	Are maintenance impacts mitigated against?	Is the likelihood of Impact of significant concern?
Vegetation shall be maintained as specified in Figure 1: *The ballasted area shall be maintained clear of all woody vegetation. The area vertically above this shall also be maintained clear of all vegetation encroaching from other areas as shown in Figure 1.* *The cess (3 meters from line) shall be maintained clear of all woody vegetation. The area vertically above this shall also be maintained clear of all vegetation*	Tilio-Acerion woodland	Management of vegetation by manual means	**Positive** Removal of non-protected species within the 3 meters will help to reduce shadow and competition. Rare species of Whitebeam and other plants species that reside in this area will have more opportunity to succeed. **Negative** There is a likely to be a reduction of INNS There are some protected species within 3 meters of the line. These species will not be removed but may be coppiced or pruned for their safety – to reduce risk of catching trains and being	**Yes** NR standards for assessing species risks including guidance for managing vegetation safely. SMS in place Site Vegetation Management Plan in place	**No** Competitive conditions should improve. Protected species will undergo assessment and consultation, with consent requested from NE prior to works being undertaken.

			pulled from their roots		
Maintain drainage so that it performs as designed to support the safe operation of the railway.	Tilio-Acerion woodland & Dry grassland and scrubland	Management of vegetation from drains and any other materials blocking them	**None** Currently no qualifying features impacted by drainage	**Yes** NR standards	None
Manage trees and vegetation beyond 3m of the line when and where required for the safe operation of the railway, taking account of the SAC and SSSI features and ensuring that they are not negatively affected by these actions. Efforts must first be made to find alternative methods of tree management (beyond felling) where a protected species is highlighted as a risk (DDD). For all of the above, if the tree is a rare species or qualifying species of the SSSI or SAC, consent from Natural England is required, except in emergency situations. Care should be taken when undergoing tree felling and rare species must not be disturbed (unless in emergency situations)	Tilio-Acerion woodland & Dry grassland and scrubland	Management of vegetation by mechanical / manual means	**Positive** Removal of non-protected vegetation beyond 3 meters will help to reduce shadow and competition. Rare species of Whitebeam and other plants species that reside in this area will have more opportunity to succeed. There is a likely to be a reduction of INNS, especially in grassland habitats. Any felled trees will be coppiced or plugged. Large timber will be left to biodegrade, supplying nutrients and food for the woodland habitats. **Negative** Some protected species may coppiced or pruned. Loss of instant feature but they will be	**Yes** NR vegetation management standards All other veg management tools exhausted before removal Consent required by NE for removal unless emergency	**No** Competitive conditions should improve. Protected species will undergo assessment and consultation, with consent requested from NE prior to works being undertaken.

without prior consent from Natural England.			able to regrow over time.		
Management of arising's as set out in the vegetation management plan based on SAC feature and species. Removal of all INNS arising's	Tilio-Acerion woodland & Dry grassland and scrubland	Storing arising's	**Positive** Any felled trees will be coppiced or plugged. Large timber will be left to biodegrade, supplying nutrients and food for the woodland habitats. **None** All other arising's will chipped into dumpy bags to be stored short term on railway sidings or in clearances along secondary woodland.	**Yes** Arising's not to be spread over qualifying features (unless large timber). Staff have competencies in vegetation management	**No**
Network Rail will inform Natural England of any emergency works undertaken within the SSSI as soon as practical (Emergency works is not to be used as an excuse for planned work nor for using the SSSI to facilitate access for engineering work for which there is a reasonable option, albeit more costly in terms of resources, time etc.)	Tilio-Acerion woodland & Dry grassland and scrubland	Management of vegetation by mechanical / manual means	**None** NR aware of the SMS and Vegetation Management Plan. They have copies of all species location in the gorge and run risk assessments for DDD trees. There shouldn't be any emergency works as all DDD trees will be managed appropriately. NE will be informed immediately of any issues.	**Yes** NR vegetation management standards All other veg management tools exhausted before removal Consent required by NE for removal unless emergency	**No**

Pesticide application within agreed weedspray restrictions. If application is by spraying within the SSSI boundary then it is only permitted as spot spraying with a knapsack sprayer fitted with a suitable nozzle to minimize any spray drift or by the use of a weedwiper when height differential is sufficient and ground conditions allow.	Tilio-Acerion woodland & Dry grassland and scrubland	Spraying herbicide.	**None** Hand spraying means that application can avoid protected species	**Yes** NR standards & Environment Agency MOU for application Hand spraying only Competent persons only can use herbicide	**No**
Infrastructure renewal – major planned works beyond infrastructure maintenance will need consent from Natural England particularly if it involves vegetation management.	Tilio-Acerion woodland & Dry grassland and scrubland	Disturbance through associated machinery and risk of fuel spillage. Removal of vegetation by mechanical / manual means	**None** Not covered under HRA. Separate consent will be required	**Yes** NE consent for works required. Risks will be discussed. Project Managers will be made aware of SMS and vegetation management plan	**No**
A proposed action plan for the management of vegetation through the designated SSSI & SAC area on the southerly section of the Avon Gorge under Network Rail control.	Tilio-Acerion woodland & Dry grassland and scrubland	Vegetation management by mechanical / manual means	**Positive** Much of the plan is to remove INNS, thinning out the canopy and improving competition for protected species and qualifying features.	**Yes** NR standards for assessing species risks including guidance for managing vegetation	**No** Competitive conditions should improve. Protected species will undergo assessment and

This plan is set out in Appendix 6 – Avon Gorge SSSI & SAC Vegetation Management Plan. This plan includes activities highlighted under routine vegetation management and those activities set out to enhance the qualifying features over the 5 year period of this SMS. Routine vegetation maintenance will be carried out in accordance with specifications controlled by Network Rail Management of Lineside Vegetation standards, where there is no impact on rare or protected species. Where vegetation management may impact on rare or protected species (as defined in Appendix 2 – Citation for SSSI) a decision on the best vegetation management options will be reviewed, in accordance with the site Vegetation Management Plan.			Management options are set so that harm to qualifying features is reduced and features are enhanced.	safely. SMS in place Site Vegetation Management Plan in place	consultation, with consent requested from NE prior to works being undertaken.
Pest control of burrowing fauna, which may be potentially destabilizing to the rail bank (such as rabbits, mink and rats).	Tilio-Acerion woodland & Dry grassland and scrubland	Burrowing animals	**None** No impact to qualifying species. There are limited records of burrowing fauna in	**Yes** NR standards for procedures in dealing with wildlife	**No**

			the area.		
Maintenance of Network Rail boundary fencing – major planned works beyond infrastructure maintenance will need consent from Natural England particularly if it involves vegetation management.	Tilio-Acerion woodland & Dry grassland and scrubland	Disturbance via digging and bringing machinery onto the site	**Negative – None** Maintenance usually requires fixing 'patches' or replacing 'like for like' lengths of fencing . Any work requiring the installation of new fencing requires a 1ft vegetation clearance either side of the fence line. This could impact on the qualifying features. This work would require consent from NE, beyond the remit of the SMS and HRA. **Positive** Fixing fencing helps to keep people from destroying qualifying features through reckless behaviours.	**Yes** NE consent required. Risks will be discussed at this stage. NR standards for fencing- risk assessments carried out	**No**
Removal of introduced or invasive species on both sides of the gorge e.g holm oak, Cotoneaster species (spp.) etc. will be a secondary but important priority. Programme and techniques will be agreed with Natural England following the ecology	Tilio-Acerion woodland & Dry grassland and scrubland	Use of chemicals and machinery may cause disturbance. Management of vegetation by mechanical / manual means	**Positive** Removing INNS will help to thin the canopy, increase light and improve competition for protected species and qualifying features	**Yes** NR standards. Veg management plan and SMS	**No**

survey. *Where consent is required for any additional operation as mentioned above, Network Rail will submit to Natural England a SSSI notice of proposed action form.*	

C2.2 In-combination with other plans and projects: Not applicable

There are no small scale projects or plans on Network Rail property that should be considered alongside this HRA.

Planning consent is being sought for the reinstatement of the Portishead line under the project title Metro West Project 1. This includes the upgrading of the current Portbury freight line and reinstating the line between Portishead and Portbury Dock Junction in Pill. This project will have an impact on the SAC but at the time of writing this HRA the project is still in the development and details are not for public awareness. As such the project has not been considered in this document. Please contact North Somerset District Council or the Network Rail Development team for more project specific information.

Any development plans will be submitted separate to this HRA and should therefore not be considered as part of the scoping.

C3. Screening Decision

Network Rail has considered routine maintenance activities under Regulation 61(1) (a) of the Conservation of Habitats and Species Regulations 2010 and has decided that it **is not** likely to have a significant effect, either alone or in combination with other plans or projects. On the basis of the plan details submitted, Network Rail has concluded that:

> There are satisfactory tools, competencies, procedures and management plans in place to propose that routine maintenance is unlikely to have significant **negative** impact (either alone or in combination with other plans or projects) on any of the qualifying features.
>
> There will be a site management statement and vegetation management plan in place to ensure that during maintenance activities Network Rail operates the safe running of the rail while taking reasonable steps to conserve and enhance the special features of the Avon Gorge SSSI and SAC along the Portbury line. During maintenance of the SAC, Network Rail notes that there will be some **positive** significant impacts when undertaking vegetation management. These activities will likely help to enhance the features of the SSSI and SAC and potentially improve their condition status. This will be achieved through clearing vegetation of invasive non-native species, thinning and opening up the canopy and increasing light and competition. This will help to create a better habitat for selective protected species and features of the SAC and SSSI.

PART D: Summery Decision

As the relevant competent authority, Network Rail has carried out a Habitats Regulations Assessment of the 'plan' as required by the Conservation of Habitats and Species Regulations 2017 and has decided that, with regard to the European Site and its qualifying features;

> Permission to carry out routine maintenance in line with Network Rails Site Management Statement for the Avon Gorge SSSI and Avon Gorge Woodlands SAC should be granted.

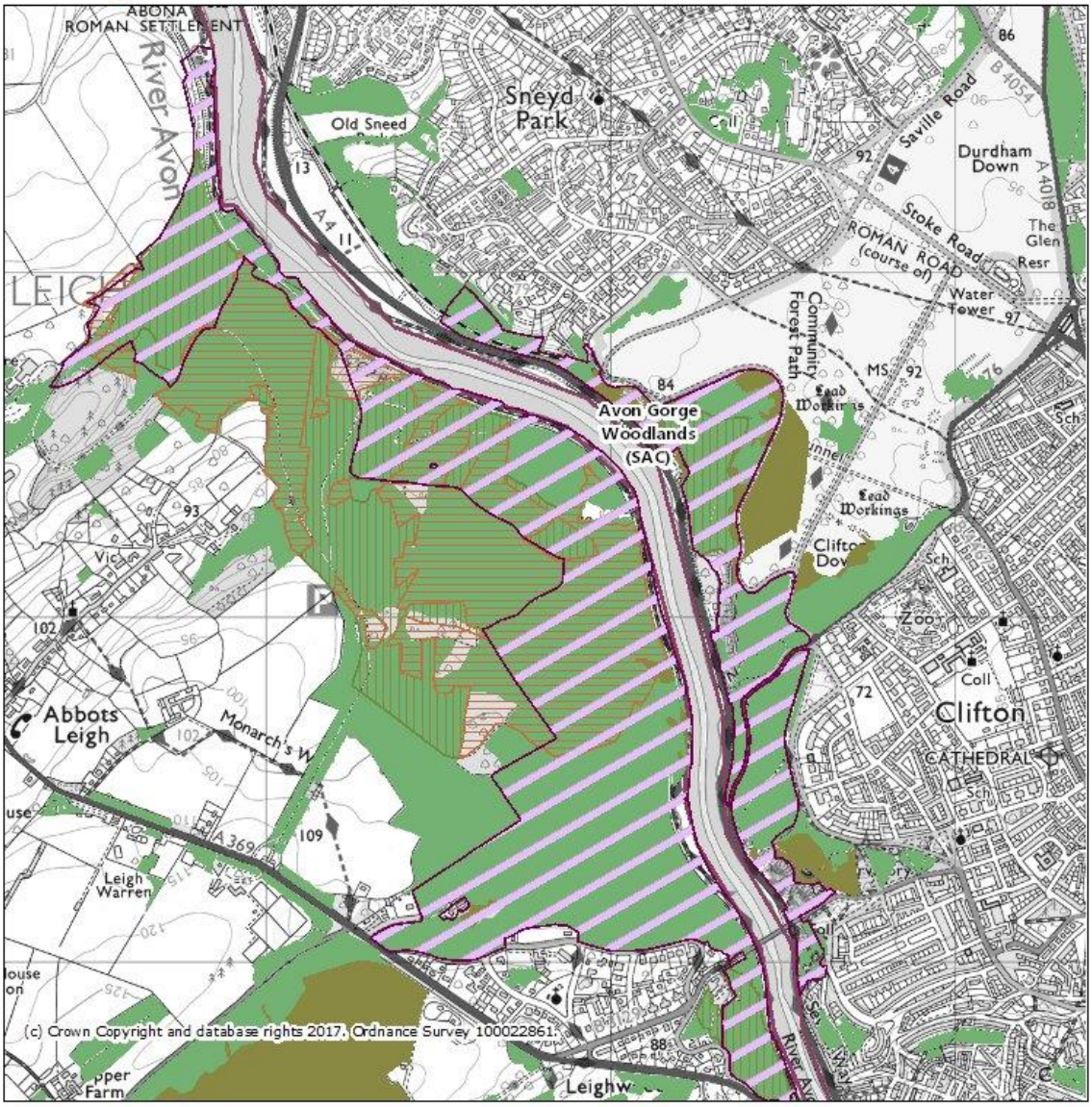
The reasons for this decision are as follows:

- The request covers only routine and general maintenance works and these are subject to Network Rail using industry best practice methods which considers the designated habitat and makes every effort to protect the special features of the SAC (in addition to that of the SSSI).
- There is a robust vegetation management plan in place to ensure qualifying features of the SAC are protected and enhanced.
- Negative significant impacts will be consulted with natural England before operations are commenced i.e. removal of protected vegetation (as per SMS requirements).
- There are a number of positive significant impacts set out in the SMS and Vegetation Management Plan. They should be seen as a method for enhancing the qualifying status and restoring the site to a good example of Tilio-Acerion woodland & Semi-natural dry grassland and scrubland.

Appendix I - Map of Avon Gorge Woodland SAC & key features

MAGIC

Magic Map



Legend

- Special Areas of Conservation (England)
- Priority Habitat Inventory - Lowland Calcareous Grassland (England)

Ancient Woodland (England)

- Ancient and Semi-Natural Woodland
- Ancient Replanted Woodland
- Priority Habitat Inventory - Deciduous Woodland (England)

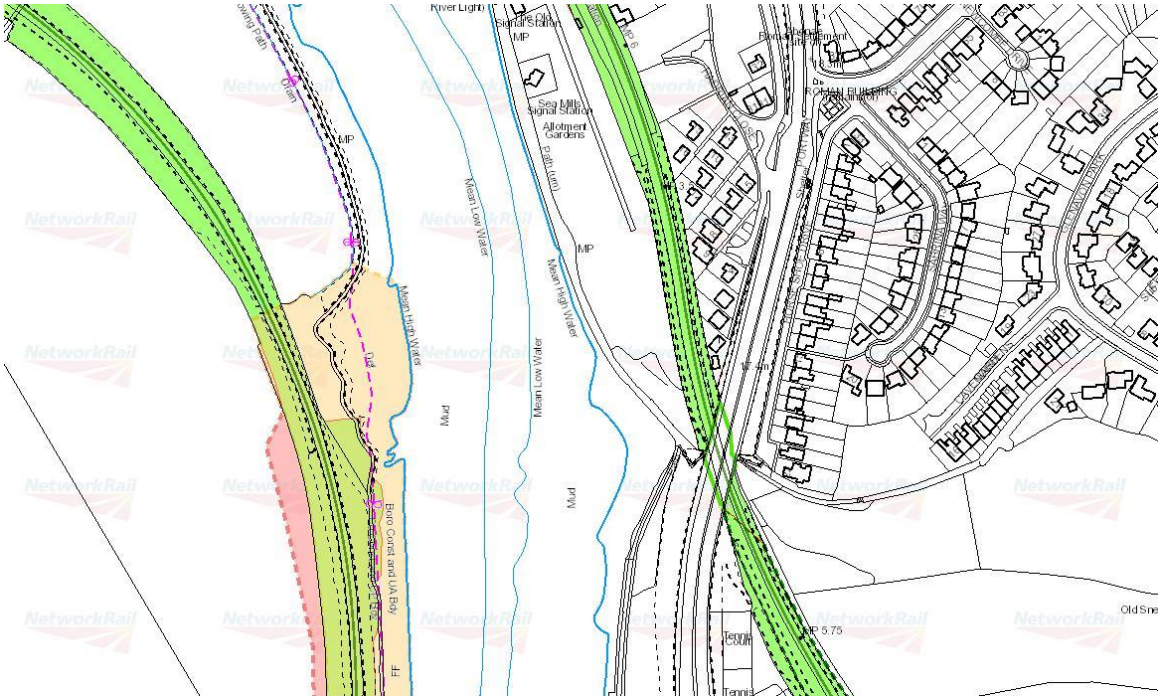
Projection = OSGB36
xmin = 352500
ymin = 172500
xmax = 359200
ymax = 175900

Map produced by MAGIC on 1 February, 2017.
Copyright resides with the data suppliers and the map must not be reproduced without their permission. Some information in MAGIC is a snapshot of the information that is being maintained or continually updated by the originating organisation. Please refer to the metadata for details as information may be illustrative or representative rather than definitive at this stage.

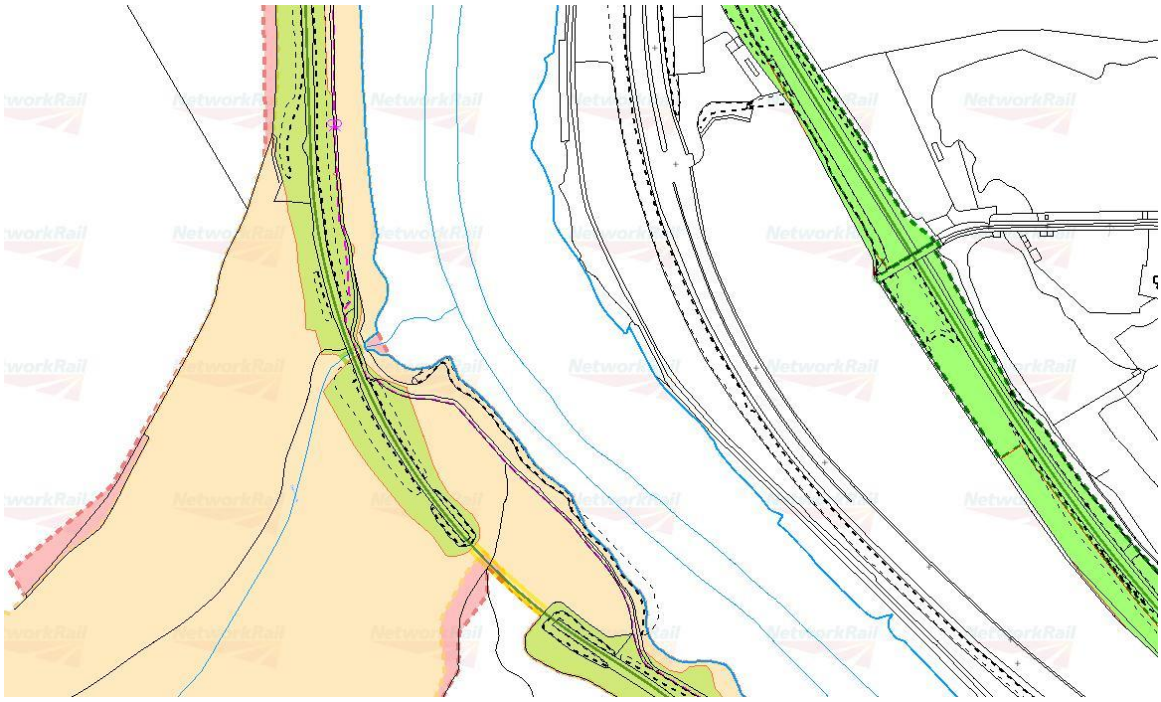
Appendix II - **Map of NR boundary within SAC**

Title: **Maps of the land (From North to South) under Network Rail's control**
Scale: **1 : 2,441**
Date Produced: **20 October 2016**
Author: **Chris Gaylard using Network Rail Mapping Software**
Orientation: **All maps face north with top of map being north**
Details: **First map is the most northern and last map most southern. Maps contain pink / orange shading depicting the SSSI and or SAC and green / brown areas the boundary of property owned and controlled by Network Rail.**
Map Based upon 2015 Boundary Survey.

Map 1 – Northern edge of the SSSI through the Avon Gorge

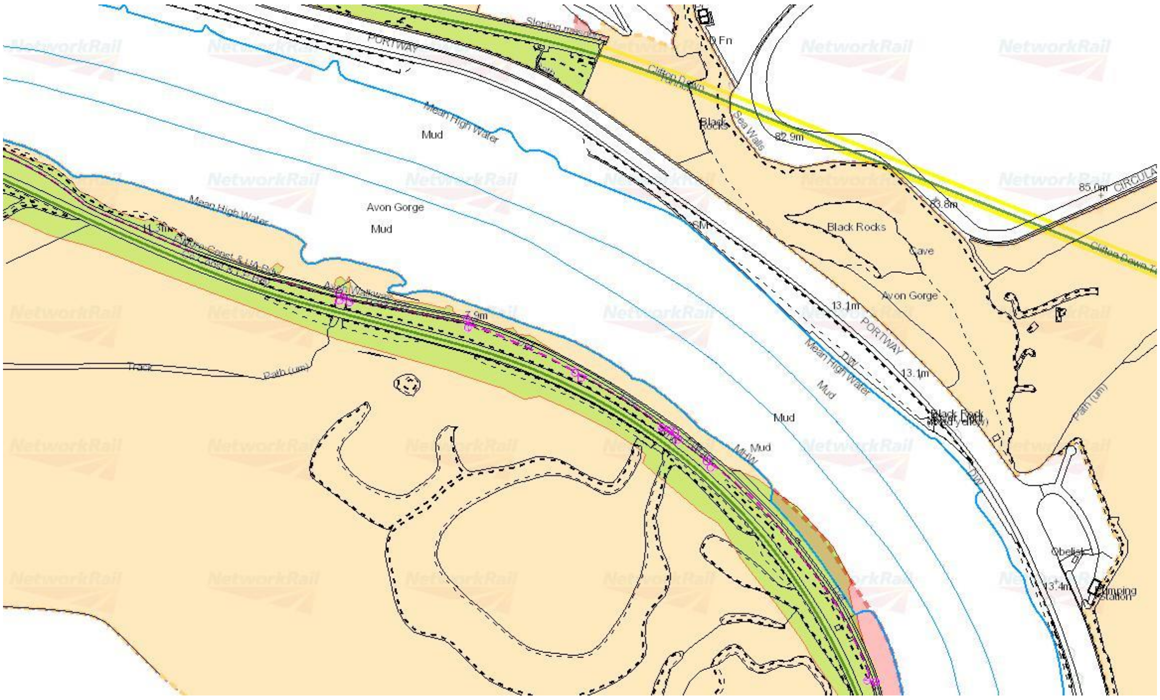


Map 2

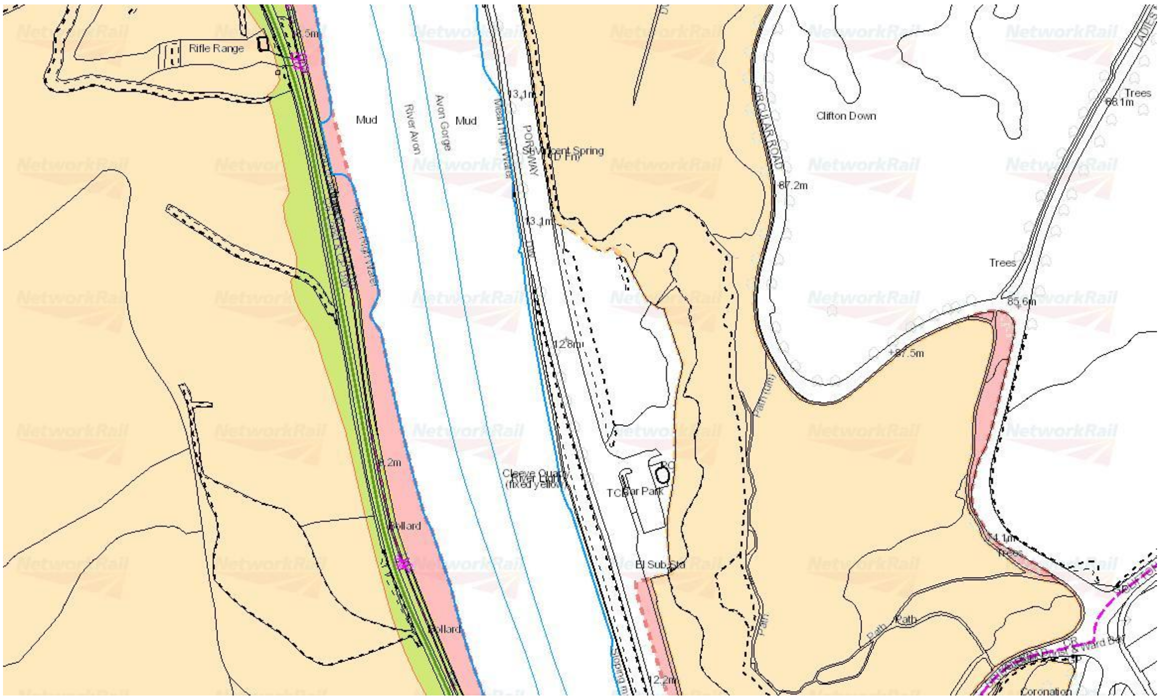


Map 3

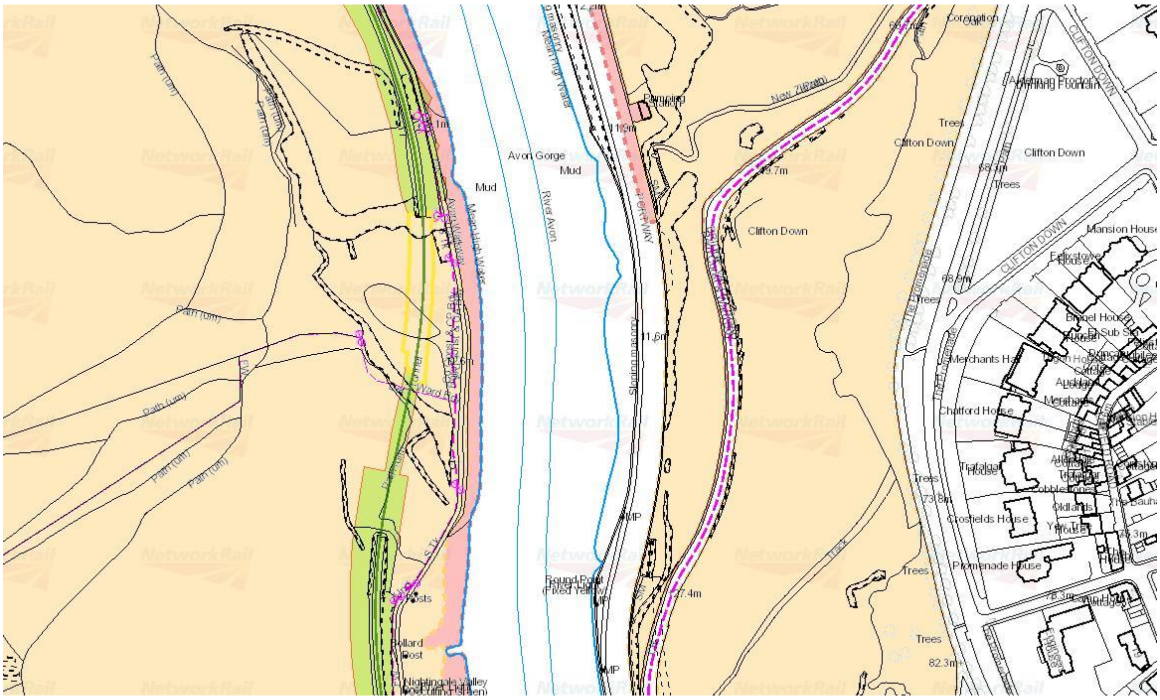
Map 4


PORTWAY
Mean High Water
Mud
Avon Gorge
Mud
Black Rocks
Cave
Avon Gorge
PORTWAY
Mean High Water
Mud
Mud
Path (um)
Obelisk
82.9m
85.0m
13.1m
13.4m

Map 5

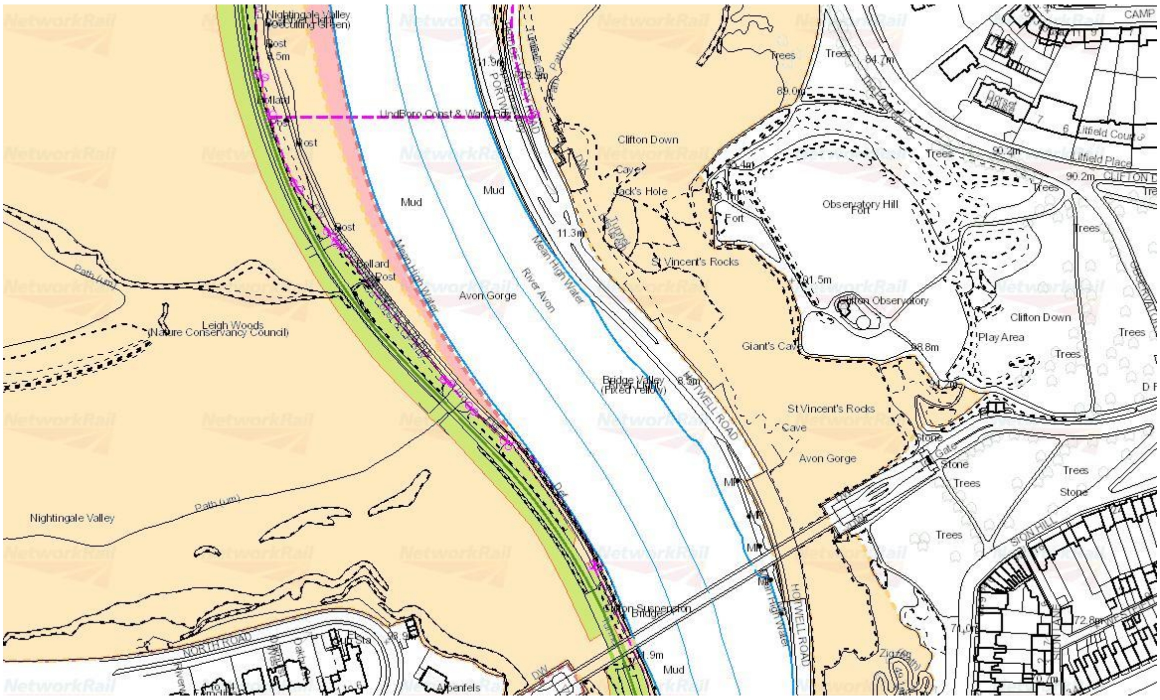

Rifle Range
Mud
River Avon
Avon Gorge
Mud
Mean High Water
PORTWAY
Clifton Down
CIRCULAR ROAD
Trees
68.1m
87.2m
Trees
85.6m
87.5m
12.8m
Bollard
Bollard
Car Park
El Sub Sta
Path
Coronation

Map 6



Avon Gorge
Mud
River Avon
Clifton Down
Trees
Mansion House
Merchants Ha
Chatford House
Promenade House
Crostfields House
Trees
82.3m

Map 7



Clifton Down
Mud
Jacob's Hole
Observatory Hill
Fort
St Vincent's Rocks
Avon Gorge
River Avon
Mean High Water
Leigh Woods (Nature Conservancy Council)
Giant's Cave
Clifton Observatory
Play Area
Trees
St Vincent's Rocks
Cave
Nightingale Valley
Path (um)
NORTH ROAD
HOTWELL ROAD
Stone
90.2m
CAMP

Map 8

MetroWest

Portishead Branch Line (MetroWest Phase 1)

TR040011
6.25, Environmental Statement, Volume 4, Appendix 9.16 The Portbury Hundred Proposed Tree Planting
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, regulation 5(2)(a)
Planning Act 2008

Author: CH2M

NetworkRail · West of England Local Enterprise Partnership · West of England Combined Authority · HM Government · Bath & North East Somerset Council · Bristol City Council · North Somerset Council · South Gloucestershire Council · travelwest

Table of Contents

Figure(s)

Acronyms and Abbreviations

B&NES	Bath and North East Somerset
BCC	Bristol City Council
DCO	Development consent order
ES	Environmental Statement
NSC	North Somerset Council
NSIP	Nationally Significant Infrastructure Project
SCG	South Gloucestershire Council
WECA	West of England Combined Authority

SECTION 1

Introduction

1.1 Background to the DCO Scheme

1.1.1 North Somerset District Council ("NSDC") is making an application for a development consent order ("DCO") to construct the Portishead Branch Line under the Planning Act 2008. The DCO Scheme will provide an hourly (or hourly plus) railway service between Portishead and Bristol Temple Meads, with stops at Portishead, Pill, Parson Street and Bedminster.

1.1.2 The scheme is one of several projects that form part of MetroWest, a programme of rail improvements in the West of England. MetroWest Phase 1 is being led jointly by NSDC and the West of England Combined Authority ("WECA")[4], as a third party promoted rail project, funded by the authorities and devolved funding sources from central government. The West of England Authorities are working with Network Rail, Great Western Railway and the wider rail industry to deliver the MetroWest Programme.

1.1.3 The Portishead Branch Line was built in the 1860s. Passenger services continued between Portishead and Bristol until 1964, and freight services continued to 1981. The Royal Portbury Dock opened in 1978 and in 2002 the currently operational part of the former Portishead Branch Line was re-opened to service the port for freight only. The owner of the Royal Portbury Dock, Bristol Port Company, has commercial rights to run up to 20 freight trains per day in each direction along the operational railway line. The current volume of freight trains operating is substantially less than this. The section of the railway between Portishead and Pill remains disused.

1.1.4 The DCO Scheme comprises the nationally significant infrastructure project ("NSIP") as defined by the Planning Act 2008 to construct a new railway between Portishead and the village of Pill, and associated works including a new station and car park at Portishead, a refurbished station and new car park at Pill and various works along the existing operational railway line between Pill and Ashton Junction where the scheme will join the existing railway. Ashton Junction is located close to the railway junction with the Bristol to Exeter Mainline at Parson Street.

1.1.5 Further information on the project is provided in the Environmental Statement ("ES") Chapter 4 Description of the Proposed Works (DCO Document Reference 6.7).

1.2 Background to this Report

1.2.1 This document details how areas for planting were selected along the highway knows as the A369 Portbury Hundred.

1.2.2 The A369 Portbury Hundred is a single carriageway road linking Portishead and Portbury. The road has been identified as a location for planting of trees to compensate for those removed from the disused railway line between

[4] WECA has powers in relation to strategic transport, housing and adult skills for Bristol City Council ("BCC"), Bath and North East Somerset ("B&NES"), and South Gloucestershire Councils ("SGC"). NSDC is not part of WECA but works closely with WECA.

Portishead and Pill for the construction and operation of the the DCO Scheme.

1.2.3 The DCO Scheme has the potential to disturb bats by removing linear features that bats use to commute between foraging grounds and roosts. Vegetation will be planted along the disused railway line corridor but planting areas are limited due to the operational widths of the railway. To compensate for the impacts, trees will be planted along the A369 Portbury Hundred within land owned by NSDC to create and improve the corridor along the carriageway and ensure there is a continuous linear feature between Portishead and Portbury to enhance the bat navigational route.

SECTION 2

Site Selection

2.1.1 Due to the health and safety risks of carrying out a survey of the A369 Portbury Hundred without traffic management in place, remote sensing was used to establish locations where compensatory tree planting could take place.

2.1.2 DEFRA's Magic Map Application and Google Earth were used to access aerial photography. Gaps within the current vegetation were then selected for proposed tree planting. The following constraints were taken into account when selecting the planting areas:

- planting to be at least 4.5 m from the highway kerb for the passive safety clear zone and ease of maintenance;
- planting does not affect forward visibility around bends or at junctions;
- avoid overhead electricity pylons;
- avoid existing field access areas; and
- avoid proposed access area for the Portbury Hundred construction site compound.

SECTION 3

Results

3.1.1 The areas identified for tree planting are shown on Figure 1 Location of Tree Planting along the Portbury Hundred Road, along with the North Somerset Council ("NSC") land ownership boundary and the NSIP Works.

3.1.2 No planting list has been produced at this stage, and this will be done during the detailed design stage. Planting of willows and poplar trees will be avoided with preference to species such as field maple, hawthorn and hornbeam.

3.1.3 The tree planting areas equate to a total area of 0.52 hectares.

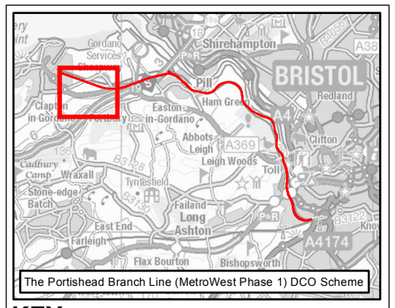
SECTION 4

References

https://magic.defra.gov.uk/MagicMap.aspx (Accessed 11/07/2019)

Google Earth (Accessed 11/07/2019)

Figure



KEY

Portishead Branch Line

- The Nationally Significant Infrastructure Project (NSIP) Works
- Tree Planting
- NSC land ownership boundary

ES-A	MPC	CW	CF	29/07/2019	First draft
Rev	By	Chkd	Apprvd	Date	Description

Client

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

CH2M HILL
Geospatial
Burderop Park, Swindon, SN4 0QD
Tel: +44 (0)1793 812479 Fax: +44 (0)1793 812089
www.ch2m.com

Project : Portishead Branch Line (MetroWest Phase 1)

Drawing : Figure 1
Location of Tree Planting along the Portbury Hundred road

Drawn By :	Martin Costello	Date: 29/07/2019
Checked By :	Clare Williams	Date: 29/07/2019
Approved By :	Carolyn Francis	Date: 29/07/2019

Drawing No. : 674946-100-001

Revision ES-A

Drawing Scale : 1:7,000 @ A3

Document Path: \\swin-fs-06\Consulting\we\Environmental_Assessment\Projects\MetroWest Phase 1\GIS\MXDs\Vegetation_Planting\Figure_1_Location_of_Tree_Planting_along_the_Portbury_Hundred_road.mxd

MetroWest

Portishead Branch Line (MetroWest Phase 1)

TR040011

Applicant: North Somerset District Council
6.25, Environmental Statement, Volume 4, Appendix 9.17 Lighting Survey Report
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, regulation 5(2)(a)
Planning Act 2008

Author: CH2M

Table of Contents

Tables

Figures

Acronyms and Abbreviations

B&NES	Bath and North East Somerset
BCC	Bristol City Council
BCT	Bat Conservation Trust
CFL	Compact fluorescent (light source)
CRoW Act	Countryside and Rights of Way Act
DCO	Development Consent Order
ES	Environmental Statement
GMT	Greenwich Mean Time
ILP	Institution of Lighting Professionals
LED	Light emitting diodes
Lux	a measure of luminescence
NSDC	North Somerset District Council
SAC	Special Areas of Conservation
SGC	South Gloucestershire Council
SON	High-pressure sodium lamps
SOX	Low-pressure sodium lamps
SSSI	Site of Special Scientific Interest
UV	Ultra violet
WECA	West of England Combined Authority

SECTION 1

Introduction

1.1 Background to the DCO Scheme

1.1.1 North Somerset District Council ("NSDC") is making an application for a development consent order ("DCO") to construct the Portishead Branch Line under the Planning Act 2008. The DCO Scheme will provide an hourly (or hourly plus) railway service between Portishead and Bristol Temple Meads, with stops at Portishead, Pill, Parson Street and Bedminster.

1.1.2 The scheme is one of several projects that form part of MetroWest, a programme of rail improvements in the West of England. MetroWest Phase 1 is being led jointly by NSDC and the West of England Combined Authority ("WECA")[5], as a third party promoted rail project, funded by the authorities and devolved funding sources from central government. The West of England Authorities are working with Network Rail, Great Western Railway and the wider rail industry to deliver the MetroWest Programme.

1.1.3 The Portishead Branch Line was built in the 1860s. Passenger services continued between Portishead and Bristol until 1964, and freight services continued to 1981. The Royal Portbury Dock opened in 1978 and in 2002 the currently operational part of the former Portishead Branch Line was re-opened to service the port for freight only. The owner of the Royal Portbury Dock, Bristol Port Company, has commercial rights to run up to 20 freight trains per day in each direction along the operational railway line. The current volume of freight trains operating is substantially less than this. The section of the railway between Portishead and Pill remains disused.

1.1.4 The DCO Scheme comprises the nationally significant infrastructure project ("NSIP") as defined by the Planning Act 2008 to construct a new railway between Portishead and the village of Pill, and associated works including a new station and car park at Portishead, a refurbished station and new car park at Pill and various works along the existing operational railway line between Pill and Ashton Junction where the scheme will join the existing railway. Ashton Junction is located close to the railway junction with the Bristol to Exeter Mainline at Parson Street.

1.1.5 Further information on the project is provided in the Environmental Statement ("ES") Chapter 4 Description of the Proposed Works (DCO Document Reference 6.7).

1.2 Lighting Survey

1.2.1 CH2M was commissioned by NSDC to undertake a lighting survey at two areas along the DCO Scheme, one along the disused section of the railway between Royal Portbury Dock Road and Marsh Lane, Portbury (NGR ST 506756 to ST 510761, Figure 1) and the other along a section of the

[5] WECA has powers in relation to strategic transport, housing and adult skills for Bristol City Council ("BCC"), Bath and North East Somerset ("B&NES"), and South Gloucestershire Councils ("SGC"). NSDC is not part of WECA but works closely with WECA.

operational freight line in Pill at the proposed location for Pill Station (NGR ST 522761 to ST 525759, Figure 2).

Figure 1. Extent of survey along the disused line Portbury Dock Road to Marsh Lane

Figure 2. Extent of survey at Pill

1.3 Purpose and Structure of this Report

1.3.1 The purpose of this report is to establish baseline obtrusive light spill to inform the lighting design for the DCO Scheme for Pill station and to establish whether existing LED lighting installed at the Court House Farm

development site for storage of vehicles and associated infrastructure is intruding on the disused railway line.

1.3.2 This report is structured along the following lines:

- Section 2 – Definition of Obtrusive light. This section defines obtrusive light and impact of light spectra on protected species.
- Section 3 – Topography and ecological value of both sites. This section describes the topography of the sites and ecological value, and includes images of the site.
- Section 4 – Methodology. This section summarises the methodology of the site survey and desk study.
- Section 5 – Baseline Conditions. This section presents the results of the surveys.
- Section 5 – Evaluation and Conclusions. This section sets out the conclusions of the appraisal.

SECTION 2

Obtrusive Light

2.1 Definitions

2.1.1 Obtrusive light is a form of pollution, simply described where light spills into areas where it is not required. The following three terms are often used by lighting engineers and fall under the umbrella of 'obtrusive light', as detailed by the Institution of Lighting Professionals ("ILP") *Guidance for the Reduction of Obtrusive Light* GN01:2011.

- Sky glow: the brightening of the night sky;
- Glare: the uncomfortable brightness of a light source when viewed against a darker background and light intrusion;
- Obtrusive light: the spilling of light beyond the boundary of an area being lit.

2.1.2 Artificial light sources are typically:

- Low-pressure sodium lamps ("SOX");
- High-pressure sodium lamps ("SON");
- Light emitting diodes ("LED");
- Compact fluorescent ("CFL").

2.1.3 Spectral distribution of these sources vary but typically are as follows:

- SOX 589 nanometres;
- SON 390 to 800 nanometres;
- LED 410 to 750 nanomeres;
- CFL 410 to 810 nanometres.

2.1.4 Other light sources are found within lighting stock but are not found in the vicinity of the survey sites so are not included in this report.

2.2 Impact on ecology and the environment

2.2.1 Obtrusive light from artificial sources can have a detrimental effect on ecology and the natural environment.

2.2.2 ILP and Bat Conservation Trust ("BCT") guidance note *Bats and artificial lighting in the UK*, GN08/18 states "*Studies have estimated that in 2016 more than 80% of the world population and more than 99% of the US & European population live under light-polluted skies"*. It further states that only about a fifth of England now has "*pristine night skies, completely free from light pollution"*.

2.2.3 Current research and guidance attributes ultra-violet ("UV") and blue light output as the main detrimental factors to impacting on ecology and the environment.

SECTION 3

Topography and Ecological Value

3.1 Topography of the disused line between Royal Portbury Dock Road and Marsh Lane

3.1.1 To the west of the site is the Royal Portbury Dock Road and to the east of the site Marsh Lane. To the north of the site is Bristol Port Company's site for storage of vehicles and associated infrastructure, referred to as 'Plot 25' by Bristol Port Company. The area to the south of the site is the Court House Farm area developed by Bristol Port Company (Planning Application reference 16/P/1987/F). Bristol Port Company's sites for storage of cargo, currently vehicles, and associated infrastructure to the north and south of the site are segregated by the disused railway line.

3.1.2 At present, Bristol Port Company uses a temporary road crossing midway on the disused railway line. National cycle route 26 runs parallel to the side between the disused railway line and 'Plot 25'. As part of their existing planning application, Bristol Port Company will construct a bridge over the disused railway line before the DCO Scheme is operational.

3.1.3 Royal Portbury Dock Road is illuminated by SON light sources and Marsh Lane is unlit.

3.1.4 'Plot 25' to the north is assumed to be illuminated by a mix of SON / unknown white light sources.

3.1.5 The Court House Farm development to the south is illuminated by LED light sources.

3.1.6 The survey area along the disused line is lined on both sides by dense hedgerows, is heavily overgrown with bramble and nettles.

3.2 Topography of Pill Station

3.2.1 Pill station lies within a cutting and is surrounded by residential roads and housing to the north and south. All highways are illuminated except for the two bridges over the railway to the east of the site.

3.2.2 Lighting on all highways is a mix of SOX and SON lamps.

3.2.3 Lighting switches off at 12.00am Greenwich Mean Time ("GMT"). Due to the summer time frame when the survey was undertaken the switch off slips to 1.00am.

3.2.4 Private floodlighting is present adjacent to the local Co-op shop. This is provided by LED floodlights.

3.3 Ecological Value

3.3.1 Bat surveys undertaken as part of the DCO Scheme (ES Appendix 9.2 Bat Technical Appendix, DCO Document Reference 6.25) have found that horseshoe bats use both sites, which are known to be light averse.

3.3.2 Bat activity surveys along the disused railway show that it is an important corridor for bats. A radio-tracking study recorded two Greater horseshoe bats tracked to Brockley Hall Stables Site of Special Scientific Interest ("SSSI"), which is part of the North Somerset and Mendips Bats Special Area of Conservation ("SAC"), a European protected site.

3.3.3 The two stone arches (Arches 1 and 2) on the disused northern platform at Pill station are used as a day roost by Lesser horseshoe bats and a night roost by Lesser and Greater horseshoe bats. Low numbers of bats (1 to 4 individuals maximum) were recorded using the structures, with observational survey data confirming solitary animals shelter there during the summer. Acoustic monitoring of the site confirmed roosting is frequent.

3.3.4 North Somerset and Mendip Bats SAC *Guidance on Development: Supplementary Planning Document* (North Somerset Council, 2018) states that "*prospective developers will be expected to provide evidence, ideally in the form of a lux contour plan and sensitive lighting strategy, with their application to demonstrate that introduced light levels will not affect existing and proposed features used by SAC bats to above 0.5 lux; or not exceeding baseline light levels where this is not feasible"*.

SECTION 4

Baseline Conditions

4.1 Context

4.1.1 A night survey was carried out at both sites on the evening of the 9th July 2019. Surveyors attended during darkness and prior to lighting being switched off. Weather conditions were warm and partially cloudy. Moonlight was present with a half moon visible intermittently throughout the survey.

4.1.2 Surveyors used a mix of two light meters to record results. Both had been calibrated within one month prior to the survey. The light meters are as follows;

- Minolta (for primarily SOX and SON light sources)
- Extech LT45 (for primarily LED light sources).

4.1.3 Lighting measurements were taken at ground level and measurements were recorded in illuminance ("lux") every 5 m. Two sections of the disused line site could not be surveyed due to the heavy undergrowth of nettles and poor accessibility. However, surveys were undertaken where possible at both ends of the site and at the temporary road crossing in the middle of the site.

4.2 Disused line Survey Results

4.2.1 The results of the light survey along the disused line from Portbury Dock Road to Marsh Lane are shown in Tables 1 and 2 and the results of the light survey at Pill is shown in Table 3.

Scheme Name	Disused Line																									
Notes	Marsh Lane Bridge		Adj. Lighting											Adj. Lighting attracting insects.			Nettles									
Meters	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	
Lux Reading (Centre of site)	0.23	0.28	0.40	0.50	0.21	0.18	0.35	0.23	0.17	0.23	0.43	0.21	0.17	0.14	0.14	0.01	No Readings									
Notes	Nettles		Temporary Road Crossing		Nettles																					
Meters	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	245	
Lux Reading (Centre of site)	No Readings		N/A		No readings.																					
Notes	Nettles																									
Meters	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355	360	365	370	
Lux Reading (Centre of site)	No Readings																									
Notes	Nettles						Portbury Dock Road Bridge																			
Meters	375	380	385	390	395	400	405																			
Lux Reading (Centre of site)	No Readings	0.12	0.14	0.07	0.10	0.10	0.08																			

Table 1. Disused line Survey Results

Notes	North reading	Centre of site	South reading
Meters	N/A	N/A	N/A
Lux Reading	24.9	0.23	0.16

Table 2. Disused line temporary road crossing Survey Results

Scheme Name	Pill																								
Notes	Western Extents																								
Meters	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120
Lux Reading (North of Rail)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.08	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Lux Reading (South of Rail)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.08	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Notes					Access Gate						Existing disused platform on northern side of rail.														
Meters	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	245
Lux Reading (North of Rail)	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Lux Reading (South of Rail)	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Notes	Existing disused platform on northern side of rail.												Under Bridge				Under Bridge		Light spill from New Road & Co-Op.						
Meters	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355	360	365	370
Lux Reading (North of Rail)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.05	0.13	0.04	0.02	0.03	0.05	0.03	1.12	1.34	1.62	1.13	1.01
Lux Reading (South of Rail)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.37	0.63	0.93	0.05	0.02	0.02	1.37	1.22	0.92	2.98	3.73	3.03	2.53
Notes						Eastern Extents																			
Meters	375	380	385	390	395	400																			
Lux Reading (North of Rail)	0.55	0.33	0.02	0.11	0.06	0.02																			
Lux Reading (South of Rail)	1.29	0.64	0.28	0.19	0.09	0.02																			

Table 3. Pill Station Survey Results

SECTION 5

Evaluation and Conclusions

5.1 Evaluation

Disused line Portbury Dock Road to Marsh Lane

5.1.1 Very low lighting levels (≤0.5 lux) are found throughout the site with peaks found on the temporary road crossing.

5.1.2 Surveyors noted light spill on trees found on the southern side of the disused line. It was not possible to record the Lux levels due to the height and inaccessibility of the area in question. Light spill is caused by existing SON lighting floodlights installed on Plot 25 to the north of the site. SON lighting is noted as attracting insects.

5.1.3 LED light sources are visible from the south of the site, but the light spill is controlled and does not spill onto the site.

Pill Station

5.1.4 Light spill was not found (0 lux) through a significant section of the track adjacent to the existing disused platform.

5.1.5 The majority of the site has very low lighting levels (0.1 lux). There is an exception where higher peaks of lighting are found at the eastern end of the site adjacent to the private floodlighting (Co-op) (0.63 lux to 3.73 Lux) and local road lighting (New Road).

5.2 Conclusions

Disused line Portbury Dock Road to Marsh Lane

5.2.1 Existing LED lighting at Court House Farm development site has minimal effect on light readings on the ground and not appear to be impacting on the disused line.

5.2.2 However, light spill from the SON light sources (installed on Plot 25 to the north of the site) onto the trees could be a concern for bats flying at height. It was also noted that there was insect activity around the SON floodlights which could be a concern as this could be interfering with local food sources for bats.

Pill Station

5.2.3 Large swathes of existing lighting at Pill Station has minimal effect on light readings. The results show Lux levels of 0.00 along the disused platform on the northern side of the rail, where the Pill Station lighting is proposed on the southern platform. No moonlight was contributing to these results due to cloud present at the time of light readings. These lux levels should be used as a baseline for the lighting design for Pill Station or the lighting should be designed to achieve <0.5 lux at the existing features used by horseshoe bats to comply with the Supplementary Planning Document detailed in Section 3.

5.2.4 The existing features used by horseshoe bats are the roost at Pill Station Arches which is located near the bridge at the end of the disused platform on the northern side of the rail and the associated bat navigational route along the northern edge of the freight line corridor.

5.2.5 Local private lighting (Co-op) and road lighting from New Road is contributing to light intrusion on the south eastern side of the site. However, this area is in a cutting and separated from the proposed Pill Station lighting by two bridges so is not impacting on current lighting levels in the Pill Station area.

MetroWest

Portishead Branch Line (MetroWest Phase 1)

TR040011

Applicant: North Somerset District Council
6.25, Environmental Statement, Volume 4, Appendix 9.18 Lux lighting plans for Pill Station car park and highways
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, regulation 5(2)(a)
Planning Act 2008

Author: CH2M

Table of Contents

Abbreviations and Acronyms

B&NES	Bath and North East Somerset
BCC	Bristol City Council
DCO	Development consent order
ES	Environmental Statement
NSIP	Nationally Significant Infrastructure Project
SGC	South Gloucestershire Council
WECA	West of England Combined Authority

SECTION 1

Introduction

1.1 Background to the DCO Scheme

1.1.1 North Somerset District Council ("NSDC") is making an application for a development consent order ("DCO") to construct the Portishead Branch Line under the Planning Act 2008. The DCO Scheme will provide an hourly (or hourly plus) railway service between Portishead and Bristol Temple Meads, with stops at Portishead, Pill, Parson Street and Bedminster.

1.1.2 The scheme is one of several projects that form part of MetroWest, a programme of rail improvements in the West of England. MetroWest Phase 1 is being led jointly by NSDC and the West of England Combined Authority ("WECA")[6], as a third party promoted rail project, funded by the authorities and devolved funding sources from central government. The West of England Authorities are working with Network Rail, Great Western Railway and the wider rail industry to deliver the MetroWest Programme.

1.1.3 The Portishead Branch Line was built in the 1860s. Passenger services continued between Portishead and Bristol until 1964, and freight services continued to 1981. The Royal Portbury Dock opened in 1978 and in 2002 the currently operational part of the former Portishead Branch Line was re-opened to service the port for freight only. The owner of the Royal Portbury Dock, Bristol Port Company, has commercial rights to run up to 20 freight trains per day in each direction along the operational railway line. The current volume of freight trains operating is substantially less than this. The section of the railway between Portishead and Pill remains disused.

1.1.4 The DCO Scheme comprises the nationally significant infrastructure project ("NSIP") as defined by the Planning Act 2008 to construct a new railway between Portishead and the village of Pill, and associated works including a new station and car park at Portishead, a refurbished station and new car park at Pill and various works along the existing operational railway line between Pill and Ashton Junction where the scheme will join the existing railway. Ashton Junction is located close to the railway junction with the Bristol to Exeter Mainline at Parson Street.

1.1.5 Further information on the project is provided in the Environmental Statement ("ES") Chapter 4 Description of the Proposed Works (DCO Document Reference 6.7).

1.2 Lighting Design at Pill

1.2.1 Bat surveys undertaken as part of the DCO Scheme environmental studies (ES Appendix 9.2 Bat Technical Appendix, DCO Document Reference 6.25) have found that two stone arches (Arches 1 and 2) on the disused northern platform at Pill station are used as a day roost by Lesser horseshoe bats

[6] WECA has powers in relation to strategic transport, housing and adult skills for Bristol City Council ("BCC"), Bath and North East Somerset ("B&NES"), and South Gloucestershire Councils ("SGC"). NSDC is not part of WECA but works closely with WECA.

Rhinolophus hipposideros and a night roost by Lesser and Greater horseshoe bats *Rhinolophus ferrumequinum*. Low numbers of bats (1 to 4 individuals maximum) were recorded using the structures, with observational survey data confirming that solitary animals shelter there during the summer. Acoustic monitoring of the site confirmed roosting is frequent.

1.2.2 The operational freight line, particularly between Pill Viaduct and Avon Road, is an important navigational route for horseshoe bats due to this being a sheltered corridor. Bat surveys using data loggers were undertaken along the freight line from Pill Viaduct to the former Portbury Dock Junction (where the disused line continues to Portishead) to obtain data each month between May and October 2019 to determine the level of use of the navigational route by horseshoe bats. No data are available at the time of writing and a preliminary assessment of the importance of the freight line at Pill as a navigational route for horseshoe bats has been undertaken by assessment of the likely navigational routes in Pill using satellite imagery. This indicates that there are limited sheltered routes between Pill Viaduct and Avon Road suitable for horseshoe bats except the freight line and the foreshore of the River Avon along the roads Underbanks and Marine Parade.

1.2.3 North Somerset and Mendip Bats SAC Guidance on Development: Supplementary Planning Document (North Somerset Council, 2018) states that "*prospective developers will be expected to provide evidence, ideally in the form of a lux contour plan and sensitive lighting strategy, with their application to demonstrate that introduced light levels will not affect existing and proposed features used by SAC bats to above 0.5 lux; or not exceeding baseline light levels where this is not feasible*"[7].

1.2.4 This document provides the preliminary design for Pill Station highway and car park lighting, including lux contour plans, in the following figures.

1.2.5 The proposed lighting positions and specification for Pill station platform, steps and ramp have been extracted from a design carried out by others. The potential light spill from the design is not shown on the figures included in this report.

[7] North Somerset Council, 2018. *North Somerset and Mendip Bats SAC Guidance on Development: Supplementary Planning Document.*

SECTION 2

References

North Somerset Council, 2018. *North Somerset and Mendip Bats SAC Guidance on Development: Supplementary Planning Document.*

LEGEND

- PROPOSED NETWORK RAIL (NR) 4m STEEL COLUMN WITH LED KIRIUM 2 AT 0° TILT, 7.58klm.
- PROPOSED NR 0.9m LED GARDA PRO ASSYM HANDRAIL 0°, 1.96klm.
- PROPOSED NORTH SOMERSET COUNCIL (NSC) 5m STEEL COLUMN WITH LED AMPERA MINI 0° TILT, 5.06klm.
- PROPOSED NSC 5m STEEL COLUMN WITH LED AXIA 2 AT 0° TILT, 4.61klm.
- PROPOSED NSC 5m STEEL COLUMN WITH LED AMPERA MINI AT 0° TILT, 4.33klm.
- PROPOSED NSC 5m STEEL COLUMN WITH LED AXIA 2 0° TILT, 7.85klm.
- PROPOSED NSC 5m STEEL COLUMN WITH LED AXIA 2 WITH BACK LOURVES AT 0° TILT, 1.85klm.
- PROPOSED NSC 5m STEEL COLUMN WITH LED AXIA 2 WITH BACK LOURVES AT 0° TILT, 4.06klm.
- EXISTING 35W SOX LUMINAIRE TO REMAIN.
- EXISTING 35W SOX LUMINAIRE TO BE REMOVED.
- PROPOSED 0.5 LUX LIGHTING CONTOUR.
- EXISTING 0.5 LUX LIGHTING CONTOUR.
- PROPOSED 1 LUX LIGHTING CONTOUR.
- EXISTING 1 LUX LIGHTING CONTOUR.

GENERAL NOTES

1. PROPOSED LIGHTING POSITIONS AND SPECIFICATION FOR NETWORK RAIL PLATFORM, STEPS AND RAMP HAVE BEEN EXTRACTED FROM A DESIGN CARRIED OUT BY OTHERS.
2. LIGHT SPILL FROM NETWORK RAIL DESIGN IS NOT SHOWN IN THIS DRAWING.
3. DUE TO A LACK OF A DETAILED SPECIFICATION SOME ASSUMPTIONS HAVE BEEN MADE TO CREATE THE CONTOURS, AND WILL REQUIRE RATIFICATION AT DETAILED DESIGN STAGE INCLUDING BUT NOT LIMITED TO UP-TO-DATE PHOTOMETRIC DATA, MOUNTING HEIGHT, ORIENTATION OF LUMINAIRE, TILT AND DIMMING REGIME.
4. DESIGN BASED ON M&E DESIGN; W1097B-ARP-FRM-EPT-000003.PDF.
5. BATS ARE KNOWN TO BE USING THE AREA FOR ROOSTING, COMMUTING AND FORAGING.
6. DESIGN IS ISSUED FOR DISCUSSION DURING THE ENVIRONMENTAL ASSESSMENT PERIOD AND SUBJECT TO CHANGE FOLLOWING DETAILED DESIGN.
7. THE CONTOURS SHOWN ARE BASED ON HORIZONTAL ILLUMINANCE VALUES ON A 2D GRID TO REPRESENT GROUND LEVEL. PLEASE NOTE THE SHADOWING CAUSED BY OBSTACLES SUCH AS BUILDINGS, TREES AND SHRUBBERY ETC HAS NOT BEEN INCLUDED AND THEREFORE THE EXTENT OF LIGHT SPILL MAY BE REDUCED IN SOME AREAS.
8. NO EXISTING HIGHWAY LIGHTING PRESENT AT ALL IN THE VICINITY OF RAILWAY COURT (OLD RAILWAY INN) ON MONMOUTH ROAD.
9. A MIXTURE OF NSC & PARISH LIGHTING IS PRESENT, AT THIS TIME IT IS ASSUMED ALL LIGHTING WILL BE OWNED AND MAINTAINED BY NSC - EXISTING COLUMN NUMBERING AND TYPE TAKEN FROM NORTH SOMERSET COUNCIL INVENTORY.
10. THE FIELD SURVEY IDENTIFIED THAT THERE IS PEDESTRIAN NIGHT TIME ACTIVITY OF LOCAL AMENITIES AND RESIDENTIAL PROPERTIES, AT DETAILED DESIGN THIS SHOULD BE FURTHER RISK ASSESSED AS PER BS5489-1:2013 A.3.3.2 & A.3.4.2. THIS COULD LEAD TO INCREASED LIGHT LEVELS DEPENDING ON FINAL CLASSIFICATION OF THE AREA. TO BE CONFIRMED AT DETAILED DESIGN.
11. EXISTING LIGHTING POINT NO. 5P HAS BEEN RECENTLY REPLACED BY AN LED LUMINAIRE, THIS REMAINS AS A 35W SOX FOR THE PURPOSE OF THIS ASSESSMENT.

Network Rail boundary fence
Network Rail maintenance compound
Existing vegetation to be retained
Car park turning head
Approximate gully location connecting to existing drainage
Gate to be added by Network Rail
Road Rail Access Point
Mobile generator location for Principal Supply Point (PSP)
Compact Principal Supply Point (PSP) on hardstanding area
Proposed gate and fence
Vehicle restraint barrier
Existing wall to be removed
Scrub and long grass for habitat
Fence and gate to be removed
Existing overhead lines
Existing kerb retained
Existing vegetation to be maintained where possible
Proposed new planting and new trees
Approximate location of tree to be removed
58 spaces & 3 disabled spaces at station forecourt
Proposed low level planting within area of visibility splay
Visibility splay. It has been used 'x' distance= 2 m and SSD= 25 m as per table 7.1 of 'Manual for Streets' assuming 85th percentile speed 20 mph
Existing telegraph pole to be removed
Proposed ramp
Existing hedge retained
Existing hedge to be cut back
Proposed informal pedestrian crossing
Proposed over run area
Gate and fence
Existing gate to be removed
Existing gate to be retained
Existing vegetation to
For continuation refer to 467470.BQ.04.20-207
For continuation refer to 467470.BQ.04.20-208
SEVERN
AVON
MONMOUTH RD
NEWPORT RD
RAILWAY LINE
CUT LINE A
117.51m
117.73m
117.65m
117.69m
117.26m
117.32m
117.05m
117.73
117.80m
117.76m
117.74m
117.69m
117.18m
117.60m
117.72m
117.77m
117.82m
117.70m
117.68m
117.73m
117.83m
118.26m
118.41m
118.55m
119.50m
120.46m

DO NOT SCALE. This drawing is to be read in conjunction with all relevant Architects, Engineers and Specialist Manufacturer's drawings and specifications. If in doubt please consult the Engineer.

0 5 10 15 20
SCALE 1:250 (A1)
SCALE 1:500 (A3)
METRES

WORK IN PROGRESS
Printed: 19/02/2018 @ 14:15

Rev	By	Chkd	Apprvd	Date	Description
A	SM	DK	CW	16/07/2019	Changes to lighting constors, amendment to lighting on Monmouth Road

travelwest
Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

CH2M HILL
1 The Square Temple Quay Bristol BS1 6DG
Tel +44 (0)117 910 2580 Fax +44 (0)117 910 2581
www.ch2m.com

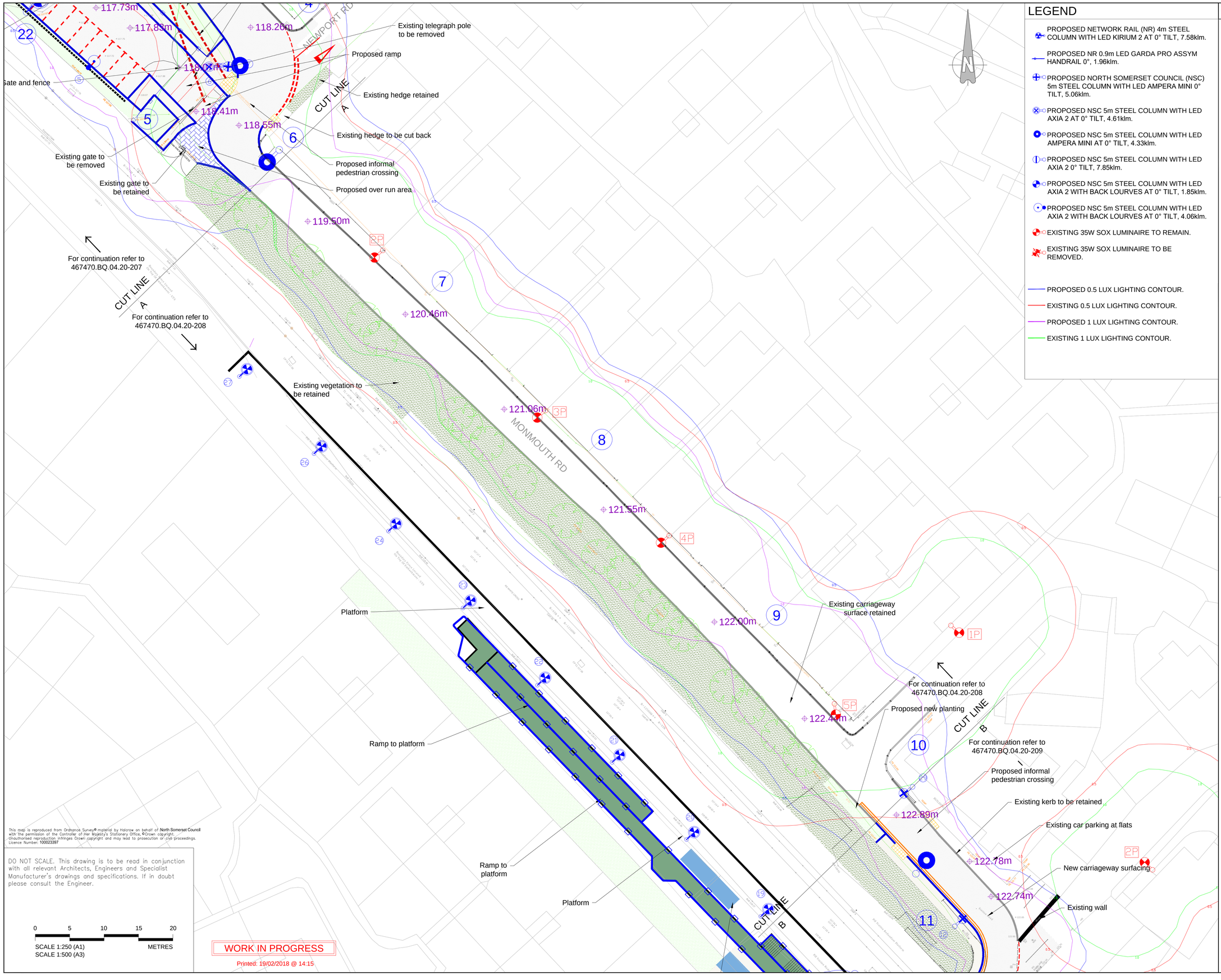
Project
PORTISHEAD BRANCH LINE
(METROWEST PHASE 1)

Drawing
PILL STATION HIGHWAY AND CAR PARK ENVIRONMENTAL LIGHTING CONTOURS SHEET 1 OF 3

Drawn by:	LM	Date:	21/06/2018
Checked by:	SM	Date:	21/06/2018
Approved by:		Date:	

Drawing No. 467470.BQ.04.20-210
Revision A
Drawing Scale: 1:250 @ A1

Drawing file path & name: T:\Street Lighting\North Somerset Metro West ES Input\Issue\ 467470.BQ.04.20-210-212.dwg



LEGEND

- PROPOSED NETWORK RAIL (NR) 4m STEEL COLUMN WITH LED KIRIUM 2 AT 0° TILT, 7.58klm.
- PROPOSED NR 0.9m LED GARDA PRO ASSYM HANDRAIL 0°, 1.96klm.
- PROPOSED NORTH SOMERSET COUNCIL (NSC) 5m STEEL COLUMN WITH LED AMPERA MINI 0° TILT, 5.06klm.
- PROPOSED NSC 5m STEEL COLUMN WITH LED AXIA 2 AT 0° TILT, 4.61klm.
- PROPOSED NSC 5m STEEL COLUMN WITH LED AMPERA MINI AT 0° TILT, 4.33klm.
- PROPOSED NSC 5m STEEL COLUMN WITH LED AXIA 2 0° TILT, 7.85klm.
- PROPOSED NSC 5m STEEL COLUMN WITH LED AXIA 2 WITH BACK LOURVES AT 0° TILT, 1.85klm.
- PROPOSED NSC 5m STEEL COLUMN WITH LED AXIA 2 WITH BACK LOURVES AT 0° TILT, 4.06klm.
- EXISTING 35W SOX LUMINAIRE TO REMAIN.
- EXISTING 35W SOX LUMINAIRE TO BE REMOVED.
- PROPOSED 0.5 LUX LIGHTING CONTOUR.
- EXISTING 0.5 LUX LIGHTING CONTOUR.
- PROPOSED 1 LUX LIGHTING CONTOUR.
- EXISTING 1 LUX LIGHTING CONTOUR.

GENERAL NOTES

1. PROPOSED LIGHTING POSITIONS AND SPECIFICATION FOR NETWORK RAIL PLATFORM, STEPS AND RAMP HAVE BEEN EXTRACTED FROM A DESIGN CARRIED OUT BY OTHERS.
2. LIGHT SPILL FROM NETWORK RAIL DESIGN IS NOT SHOWN IN THIS DRAWING.
3. DUE TO A LACK OF A DETAILED SPECIFICATION SOME ASSUMPTIONS HAVE BEEN MADE TO CREATE THE CONTOURS, AND WILL REQUIRE RATIFICATION AT DETAILED DESIGN STAGE INCLUDING BUT NOT LIMITED TO UP-TO-DATE PHOTOMETRIC DATA, MOUNTING HEIGHT, ORIENTATION OF LUMINAIRE, TILT AND DIMMING REGIME.
4. DESIGN BASED ON M&E DESIGN; W1097B-ARP-FRM-EPT-000003.PDF.
5. BATS ARE KNOWN TO BE USING THE AREA FOR ROOSTING, COMMUTING AND FORAGING.
6. DESIGN IS ISSUED FOR DISCUSSION DURING THE ENVIRONMENTAL ASSESSMENT PERIOD AND SUBJECT TO CHANGE FOLLOWING DETAILED DESIGN.
7. THE CONTOURS SHOWN ARE BASED ON HORIZONTAL ILLUMINANCE VALUES ON A 2D GRID TO REPRESENT GROUND LEVEL. PLEASE NOTE THE SHADOWING CAUSED BY OBSTACLES SUCH AS BUILDINGS, TREES AND SHRUBBERY ETC HAS NOT BEEN INCLUDED AND THEREFORE THE EXTENT OF LIGHT SPILL MAY BE REDUCED IN SOME AREAS.
8. NO EXISTING HIGHWAY LIGHTING PRESENT AT ALL IN THE VICINITY OF RAILWAY COURT (OLD RAILWAY INN) ON MONMOUTH ROAD.
9. A MIXTURE OF NSC & PARISH LIGHTING IS PRESENT, AT THIS TIME IT IS ASSUMED ALL LIGHTING WILL BE OWNED AND MAINTAINED BY NSC - EXISTING COLUMN NUMBERING AND TYPE TAKEN FROM NORTH SOMERSET COUNCIL INVENTORY.
10. THE FIELD SURVEY IDENTIFIED THAT THERE IS PEDESTRIAN NIGHT TIME ACTIVITY OF LOCAL AMENITIES AND RESIDENTIAL PROPERTIES, AT DETAILED DESIGN THIS SHOULD BE FURTHER RISK ASSESSED AS PER BS5489-1:2013 A.3.3.2 & A.3.4.2. THIS COULD LEAD TO INCREASED LIGHT LEVELS DEPENDING ON FINAL CLASSIFICATION OF THE AREA. TO BE CONFIRMED AT DETAILED DESIGN.
11. EXISTING LIGHTING POINT NO. 5P HAS BEEN RECENTLY REPLACED BY AN LED LUMINAIRE, THIS REMAINS AS A 35W SOX FOR THE PURPOSE OF THIS ASSESSMENT.

DO NOT SCALE. This drawing is to be read in conjunction with all relevant Architects, Engineers and Specialist Manufacturer's drawings and specifications. If in doubt please consult the Engineer.

0 5 10 15 20 METRES

SCALE 1:250 (A1)
SCALE 1:500 (A3)

WORK IN PROGRESS

Printed: 19/02/2018 @ 14:15

Rev	By	Chkd	Apprvd	Date	Description
A	SM	DK	CW	16/07/2019	Changes to lighting constors, amendment to lighting on Monmouth Road

travelwest
Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

CH2M HILL
1 The Square Temple Quay Bristol BS1 6DG
Tel +44 (0)117 910 2580 Fax +44 (0)117 910 2581
www.ch2m.com

Project

PORTISHEAD BRANCH LINE
(METROWEST PHASE 1)

Drawing

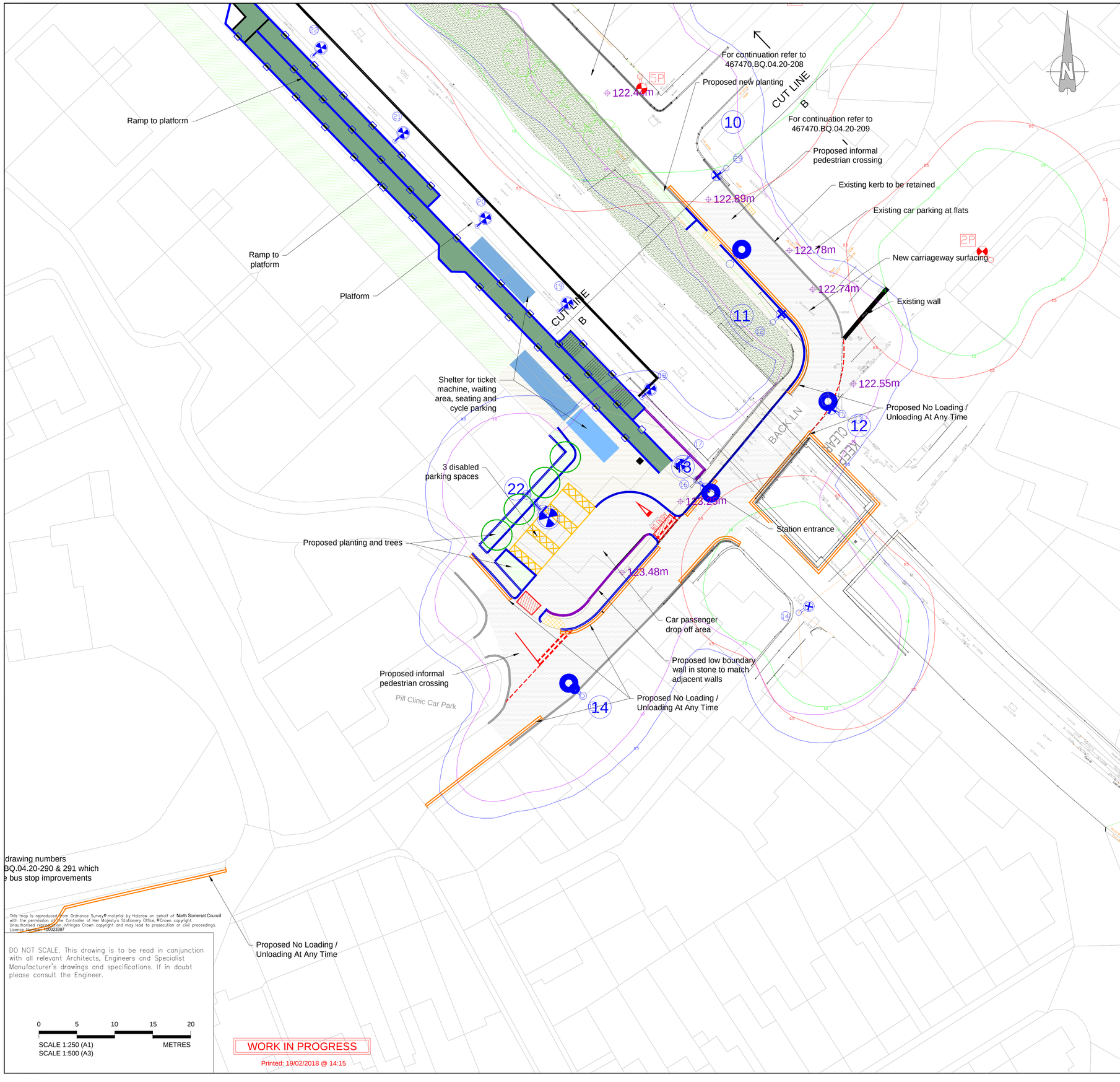
PILL STATION HIGHWAY AND CAR PARK ENVIRONMENTAL LIGHTING CONTOURS SHEET 2 OF 3

Drawn by:	LM	Date:	21/06/2018
Checked by:	SM	Date:	21/06/2018
Approved by:		Date:	

Drawing No.	Revision
467470.BQ.04.20-211	A

Drawing Scale: 1:250 @ A1

Drawing file path & name: T:\Street Lighting\North Somerset Metro West ES Input\Issue\ 467470.BQ.04.20-210-212.dwg



drawing numbers
BQ.04.20-290 & 291 which
e bus stop improvements

DO NOT SCALE. This drawing is to be read in conjunction with all relevant Architects, Engineers and Specialist Manufacturer's drawings and specifications. If in doubt please consult the Engineer.

0 5 10 15 20
METRES
SCALE 1:250 (A1)
SCALE 1:500 (A3)

WORK IN PROGRESS
Printed: 19/02/2018 @ 14:15

LEGEND

- PROPOSED NETWORK RAIL (NR) 4m STEEL COLUMN WITH LED KIRIUM 2 AT 0° TILT, 7.58klm.
- PROPOSED NR 0.9m LED GARDA PRO ASSYM HANDRAIL 0°, 1.96klm.
- PROPOSED NORTH SOMERSET COUNCIL (NSC) 5m STEEL COLUMN WITH LED AMPERA MINI 0° TILT, 5.06klm.
- PROPOSED NSC 5m STEEL COLUMN WITH LED AXIA 2 AT 0° TILT, 4.61klm.
- PROPOSED NSC 5m STEEL COLUMN WITH LED AMPERA MINI AT 0° TILT, 4.33klm.
- PROPOSED NSC 5m STEEL COLUMN WITH LED AXIA 2 0° TILT, 7.85klm.
- PROPOSED NSC 5m STEEL COLUMN WITH LED AXIA 2 WITH BACK LOURVES AT 0° TILT, 1.85klm.
- PROPOSED NSC 5m STEEL COLUMN WITH LED AXIA 2 WITH BACK LOURVES AT 0° TILT, 4.06klm.
- EXISTING 35W SOX LUMINAIRE TO REMAIN.
- EXISTING 35W SOX LUMINAIRE TO BE REMOVED.
- PROPOSED 0.5 LUX LIGHTING CONTOUR.
- EXISTING 0.5 LUX LIGHTING CONTOUR.
- PROPOSED 1 LUX LIGHTING CONTOUR.
- EXISTING 1 LUX LIGHTING CONTOUR.

GENERAL NOTES

1. PROPOSED LIGHTING POSITIONS AND SPECIFICATION FOR NETWORK RAIL PLATFORM, STEPS AND RAMP HAVE BEEN EXTRACTED FROM A DESIGN CARRIED OUT BY OTHERS.
2. LIGHT SPILL FROM NETWORK RAIL DESIGN IS NOT SHOWN IN THIS DRAWING.
3. DUE TO A LACK OF A DETAILED SPECIFICATION SOME ASSUMPTIONS HAVE BEEN MADE TO CREATE THE CONTOURS, AND WILL REQUIRE RATIFICATION AT DETAILED DESIGN STAGE INCLUDING BUT NOT LIMITED TO UP-TO-DATE PHOTOMETRIC DATA, MOUNTING HEIGHT, ORIENTATION OF LUMINAIRE, TILT AND DIMMING REGIME.
4. DESIGN BASED ON M&E DESIGN; W1097B-ARP-FRM-EPT-000003.PDF.
5. BATS ARE KNOWN TO BE USING THE AREA FOR ROOSTING, COMMUTING AND FORAGING.
6. DESIGN IS ISSUED FOR DISCUSSION DURING THE ENVIRONMENTAL ASSESSMENT PERIOD AND SUBJECT TO CHANGE FOLLOWING DETAILED DESIGN.
7. THE CONTOURS SHOWN ARE BASED ON HORIZONTAL ILLUMINANCE VALUES ON A 2D GRID TO REPRESENT GROUND LEVEL. PLEASE NOTE THE SHADOWING CAUSED BY OBSTACLES SUCH AS BUILDINGS, TREES AND SHRUBBERY ETC HAS NOT BEEN INCLUDED AND THEREFORE THE EXTENT OF LIGHT SPILL MAY BE REDUCED IN SOME AREAS.
8. NO EXISTING HIGHWAY LIGHTING PRESENT AT ALL IN THE VICINITY OF RAILWAY COURT (OLD RAILWAY INN) ON MONMOUTH ROAD.
9. A MIXTURE OF NSC & PARISH LIGHTING IS PRESENT, AT THIS TIME IT IS ASSUMED ALL LIGHTING WILL BE OWNED AND MAINTAINED BY NSC - EXISTING COLUMN NUMBERING AND TYPE TAKEN FROM NORTH SOMERSET COUNCIL INVENTORY.
10. THE FIELD SURVEY IDENTIFIED THAT THERE IS PEDESTRIAN NIGHT TIME ACTIVITY OF LOCAL AMENITIES AND RESIDENTIAL PROPERTIES, AT DETAILED DESIGN THIS SHOULD BE FURTHER RISK ASSESSED AS PER BS5489-1:2013 A.3.3.2 & A.3.4.2. THIS COULD LEAD TO INCREASED LIGHT LEVELS DEPENDING ON FINAL CLASSIFICATION OF THE AREA. TO BE CONFIRMED AT DETAILED DESIGN.
11. EXISTING LIGHTING POINT NO. 5P HAS BEEN RECENTLY REPLACED BY AN LED LUMINAIRE, THIS REMAINS AS A 35W SOX FOR THE PURPOSE OF THIS ASSESSMENT.

Rev	By	Chkd	Apprvd	Date	Description
A	SM	DK	CW	16/07/2019	Changes to lighting constors, amendment to lighting on Monmouth Road

travelwest
Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

CH2M HILL
1 The Square Temple Quay Bristol BS1 6DG
Tel +44 (0)117 910 2580 Fax +44 (0)117 910 2581
www.ch2m.com

Project
PORTISHEAD BRANCH LINE
(METROWEST PHASE 1)

Drawing
PILL STATION HIGHWAY AND CAR PARK ENVIRONMENTAL LIGHTING CONTOURS SHEET 3 OF 3

Drawn by:	LM	Date:	21/06/2018
Checked by:	SM	Date:	21/06/2018
Approved by:		Date:	

Drawing No. 467470.BQ.04.20-212
Revision A
Drawing Scale: 1:250 @ A1

Drawing file path & name: T:\Street Lighting\North Somerset Metro West ES Input\Issue\ 467470.BQ.04.20-210-212.dwg