

PORTISHEAD BRANCH LINE PRELIMINARY  
ENVIRONMENTAL INFORMATION REPORT  
VOLUME 1

## Non-Technical Summary





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# Non-Technical Summary

## 1.1 Introduction

### MetroWest Phase 1

1.1.1 The MetroWest Phase 1 project comprises the delivery of infrastructure and passenger train operations to provide:

- i. a half hourly service for the Severn Beach line (hourly for St. Andrews Road station and Severn Beach station);
- ii. a half hourly service for Keynsham and Oldfield Park stations on the Bath Spa to Bristol line; and
- iii. an hourly service (or an 'hourly service plus') for a reopened Portishead Branch Line with new/reopened stations at Portishead and Pill (and also serving existing stations at Parson Street, Bedminster and Bristol Temple Meads).

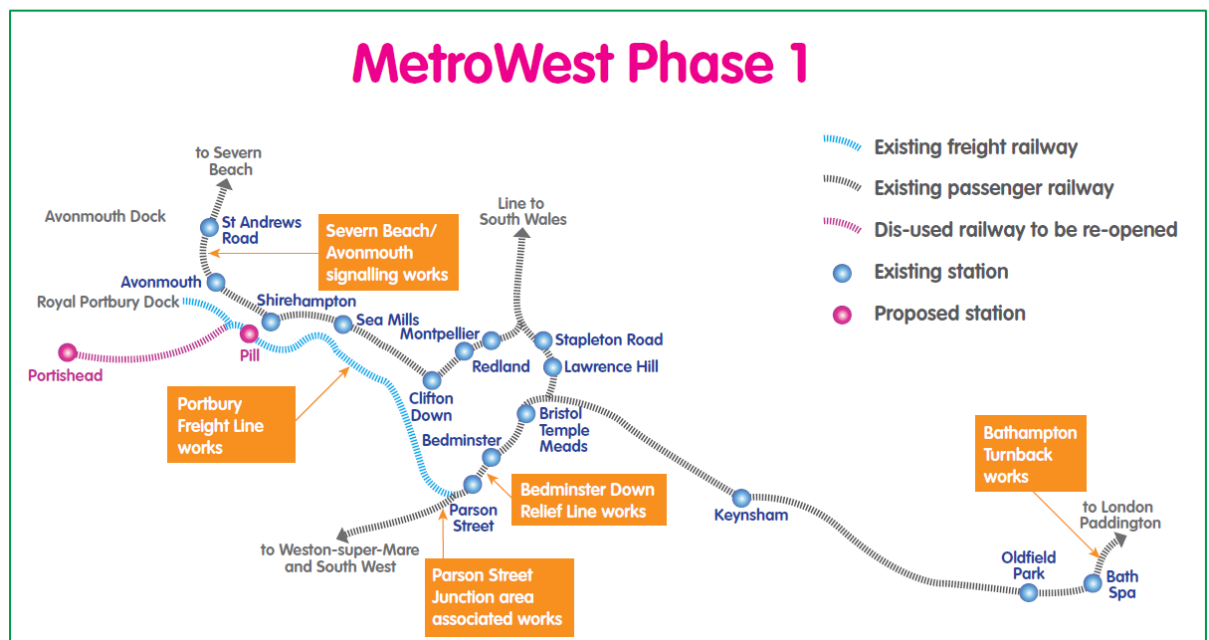


Figure 1: MetroWest Phase 1

1.1.2 Only the proposed infrastructure for the Portishead Branch Line is included in the Development Consent Order ("DCO") Scheme, as all the other works are within the existing operational railway and can be delivered using Network Rail's general permitted development rights.

### Portishead Branch Line DCO Scheme

1.1.3 The hourly service for the Portishead Branch Line entails passenger trains operating hourly all day between Portishead and Bristol Temple Meads, calling at Pill, Parson Street, and Bedminster. This provides up to 18 passenger trains in each direction per day (Monday to Saturday), with approximately 10 passenger trains in each direction on Sundays. The alternative 'hourly service plus' for the Portishead Branch Line entails passenger trains operating every 45 minutes during the am and pm peak and hourly off peak, between Portishead and Bristol Temple Meads, calling at Pill, Parson Street, and Bedminster. This hourly service plus option provides up to 20 passenger trains in each direction per day

(Monday to Saturday), with approximately 10 passenger trains in each direction on Sundays.

- 1.1.4 The reconstruction of the existing disused section of the railway line between Portishead and Pill falls within the definition of a Nationally Significant Infrastructure Project (“NSIP”) because it is the construction of a railway over 2 km in length. Other works required for the DCO Scheme, referred to as the associated development works, are the new stations, works to the highway at Portishead and the alterations to the railway between Pill and Ashton Junction.

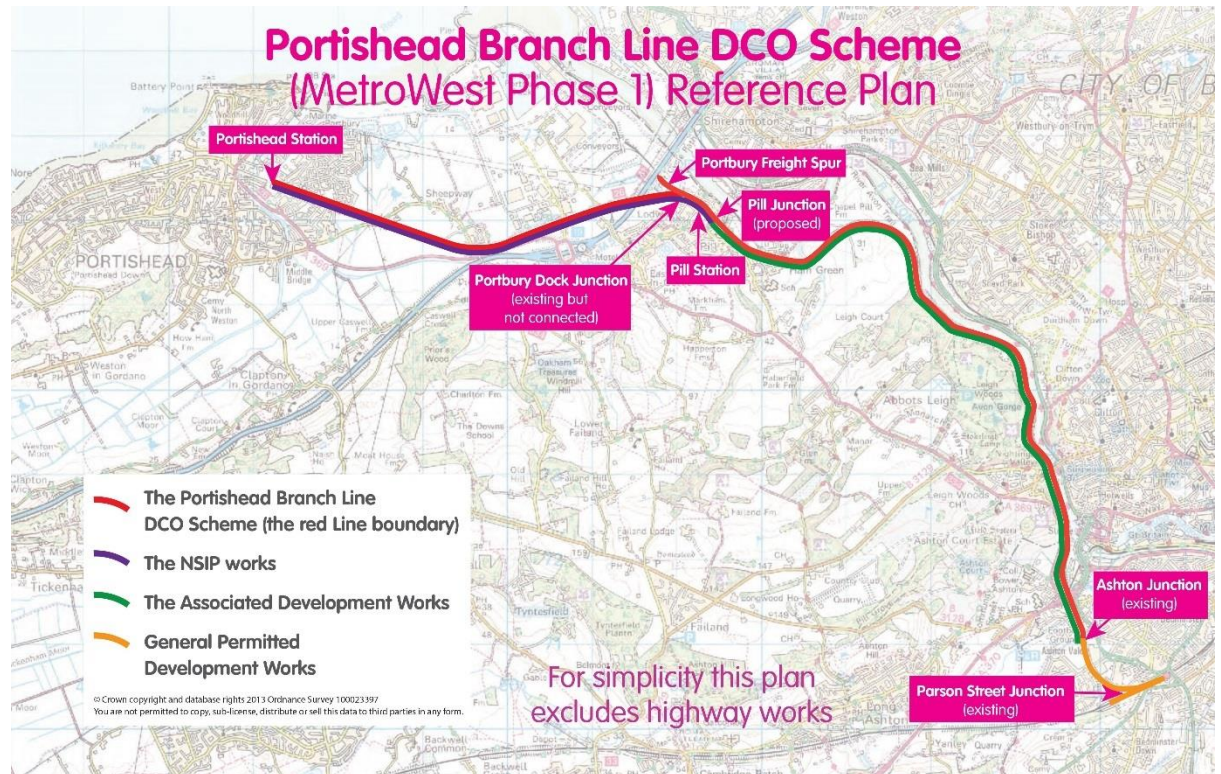


Figure 2: Reference Plan for the DCO Scheme

- 1.1.5 The NSIP is a permanent railway of approximately 5,450 m long from Quays Avenue in Portishead to the existing operational railway (Portbury freight line) to the east of the M5 Motorway, then running parallel to the existing operational railway to a new junction east of Pill Viaduct (the new Pill Junction) to connect with the existing operational railway. It comprises of the reconstruction of 4,750 m of disused railway from Quays Avenue in Portishead, North Somerset (OSGR ST471765) to Pill in North Somerset (OSGR ST520762) with a further 750 m of new track through Pill village parallel to the Portbury Freight Line.
- 1.1.6 The Associated Development works comprise:
- a new railway station at Portishead;
  - car parks, pedestrian / cycle / highway infrastructure at Portishead including re-alignment of Quays Avenue and a new footbridge near Trinity Primary School;
  - re-opening the former Pill station (southern platform) including demolition of the existing station house for a new station forecourt, a separate main car park, pedestrian / cycle and highway infrastructure;
  - new permanent maintenance compounds from Portishead to Ashton Junction;
  - temporary construction compounds between Portishead and Ashton Junction;

- works to upgrade the existing operational railway line from Royal Portbury Dock to Ashton Junction (referred to as the Portbury Freight Line) to enable operation of both passenger train and freight train services; and associated works to pedestrian / cycle / highway infrastructure including modifications to the National Cycle Network and closure the Barons Close (Container Crossing) pedestrian level crossing;
- Ashton Vale level crossing remains operational, with no alterations to the level crossing itself, the following works are proposed to reduce the highway traffic impact from the increased use of the level crossing:
  - Extension of the left turn lane on Winterstoke Road,
  - Optimisation of the Ashton Vale Road signals (now that South Bristol Link is open), and upgrade of signals to MOVA, and
  - Provision of a pedestrian and cycle ramp from Ashton Vale Road to Ashton Road;

1.1.7 Alterations to the public right of way network at Barons Close.

## Purpose of the Non-Technical Summary

1.1.8 The Preliminary Environmental Information Report (“PEI Report”) has been prepared to provide stakeholders with information on the identification and assessment of likely significant environmental effects of the DCO Scheme drawing on work undertaken to date. The PEI Report is being made available to the public for the Stage 2 Consultation being held between 23 October and 4 December 2017.

1.1.9 The PEI Report comprises four volumes:

- Volume 1 – a Non-Technical Summary which is a summary of the PEI Report written in non-technical language
- Volume 2 – the main PEI Report in 19 chapters
- Volume 3 – the book of figures
- Volume 4 – technical appendices

1.1.10 This document is the Non-Technical Summary (“NTS”) which provides a summary of the PEI Report using the same chapter structure as the main report. Further details on each subsection can be found in the corresponding chapter in Volume 2.

## 1.2 Study Area

1.2.1 The DCO Scheme is located along an existing railway corridor between Portishead and the outskirts of Bristol, in the west of England. Portishead is situated on the coast of North Somerset about 3 km from the confluence of the River Avon with the Severn Estuary. The railway corridor follows the River Avon upstream, through the Avon Gorge on its western (left hand) flank towards the outskirts of Bristol, where it joins the main Bristol to Exeter railway line at Parson Street Junction located to the south west of Parson Street Station.

1.2.2 The original railway line was built in the 1860s and closed in the 1960s. The branch line from Parson Street Junction to Royal Portbury Dock was re-opened in 2002 for freight trains only. The disused railway between Portishead and Pill remains in place (see Plate 1).





Plate 1: View of the disused railway line east from Sheepway bridge

- 1.2.3 The western end of the railway corridor lies in the retail area near the centre of Portishead between Harbour Road, Station Road, and Wyndham Way. The railway corridor passes newly built retail areas and continues through modern residential areas on the eastern side of Portishead with Trinity Primary School on the north side of the railway corridor.
- 1.2.4 Between Portishead and Pill the railway corridor crosses the low lying coastal plains of North Somerset. The land use is predominantly agricultural. The Royal Portbury Dock lies to the north west of the railway corridor between Portbury and Pill. The M5 Motorway and Junction 19 lie to the south east.
- 1.2.5 On the approach to Pill, the railway corridor joins the existing operational Portbury Freight Line from Royal Portbury Dock at Portbury Junction. The railway corridor passes through Pill with residential housing along both sides. The site of the former station in Pill lies on Station Road and about 100 m to the east of Station Road, the railway corridor crosses a low-lying valley over Pill Viaduct. The railway enters a tunnel (known both as Ham Green Tunnel and Pill Tunnel) which was built in the 1860s as part of the original railway.
- 1.2.6 The railway emerges from the tunnel at the former Ham Green Halt and swings in a broad loop to follow the River Avon upstream towards Bristol. This area is predominantly rural with farmland extending northwards to the shores of the River Avon and south towards Leigh Woods. Mature trees line the railway boundary along both sides. About 120 m east of Pill Tunnel eastern portal, the railway crosses Ham Green lakes on Miles Viaduct. About 600 m further east Chapel Pill Lane passes over the railway providing the only vehicular crossing of the railway between Ham Green and the Clifton Suspension Bridge in the gorge itself.
- 1.2.7 The alignment through the Avon Gorge is at the base of the cliff, close to the water's edge. The railway passes through the lower extents of the heavily wooded western slopes of the Avon Gorge. These woodlands are designated at the European level as the Avon Gorge Woodlands Special Area of Conservation ("SAC") for their woodland and calcareous grassland habitats and at the national level for their ecological and geological interest as



the Avon Gorge Site of Special Scientific Interest (“SSSI”). The railway is separated from the River Avon by a narrow strip of trees and shrubs, the River Avon Tow Path and sections of flood defences. The river is tidal and at low tide extensive mud banks are exposed.

- 1.2.8 The only settlement in this section close to the western side of the Avon gorge is Leigh Woods, which is located above the gorge (and above the railway corridor). Leigh Woods can be accessed from Bristol via the Clifton Suspension Bridge. The city of Bristol lies on the east side of the River Avon. Properties on the western edge of Bristol have panoramic views across the River Avon and the Gorge, and there are important viewing points up and down the Gorge, for example at Sea Walls in The Downs Conservation Area and from the Clifton Suspension Bridge. The A4 Portway runs along the eastern bank of the river.
- 1.2.9 The railway corridor emerges from the Avon Gorge past the former Clifton Bridge Station, crossing low lying open land between the A369 Clanage Road (from Portishead to Ashton) and the River Avon, running alongside cricket fields, Bower Ashton University Campus, allotments and the A370 Brunel Way to the east. The railway corridor passes under the A370 into the Ashton Gate area past the former station site.
- 1.2.10 From the A370 Brunel Way underpass, the railway passes the A3029 Winterstoke Road with Ashton Gate Stadium and industrial and retail areas to the east. The land use along the western side of the railway corridor comprises the Ashton Vale Road Industrial Estate, the Alderman Moore’s Allotments, Ashton Vale residential area, and the Liberty Industrial Park.
- 1.2.11 The railway joins the main line between Bristol and Exeter at Parson Street Junction, near the A38 Bedminster Down Road overbridge. Parson Street railway station is located on the main line, about 300 m on the up line.



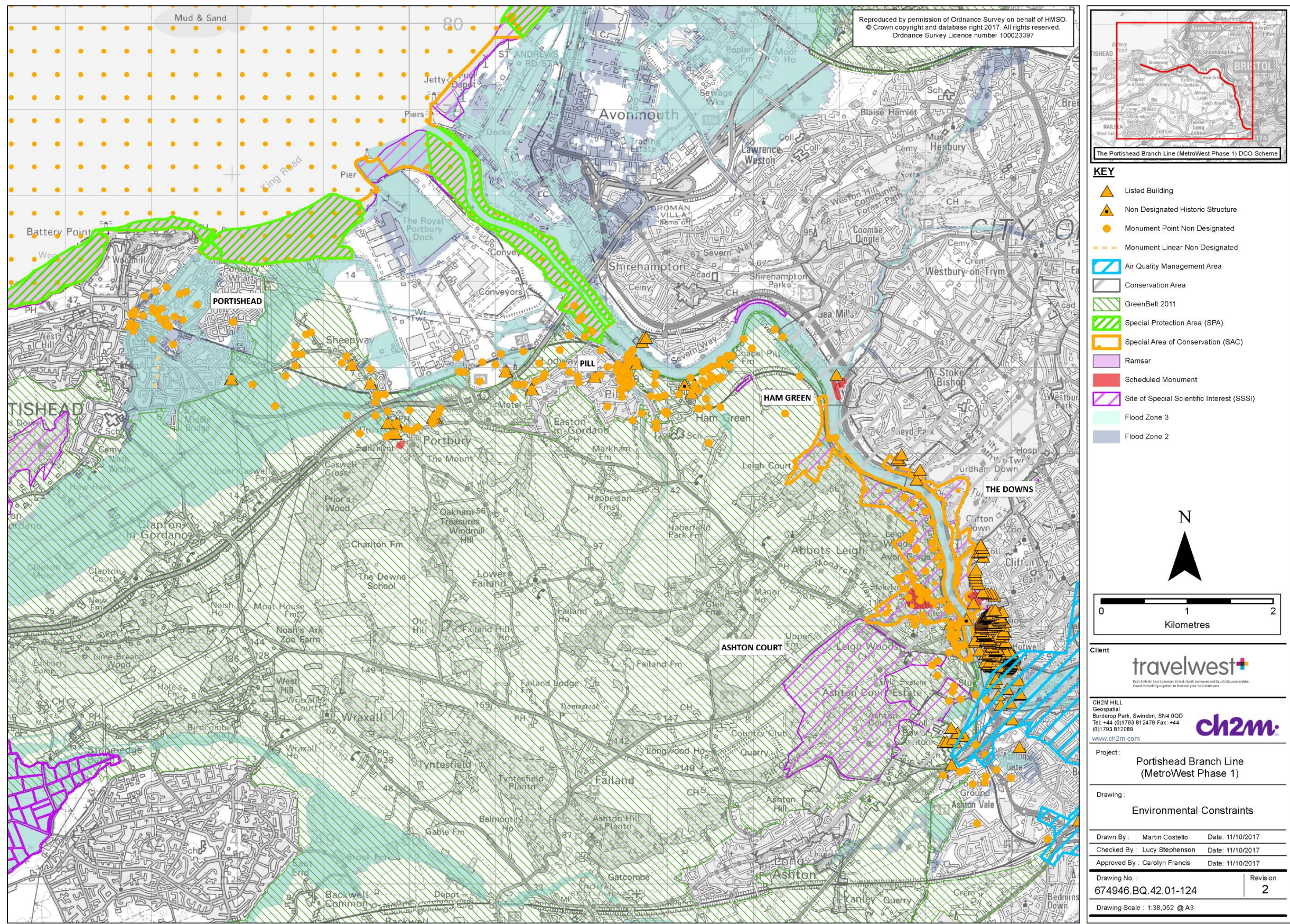


Figure 3: Environmental Constraints Drawing

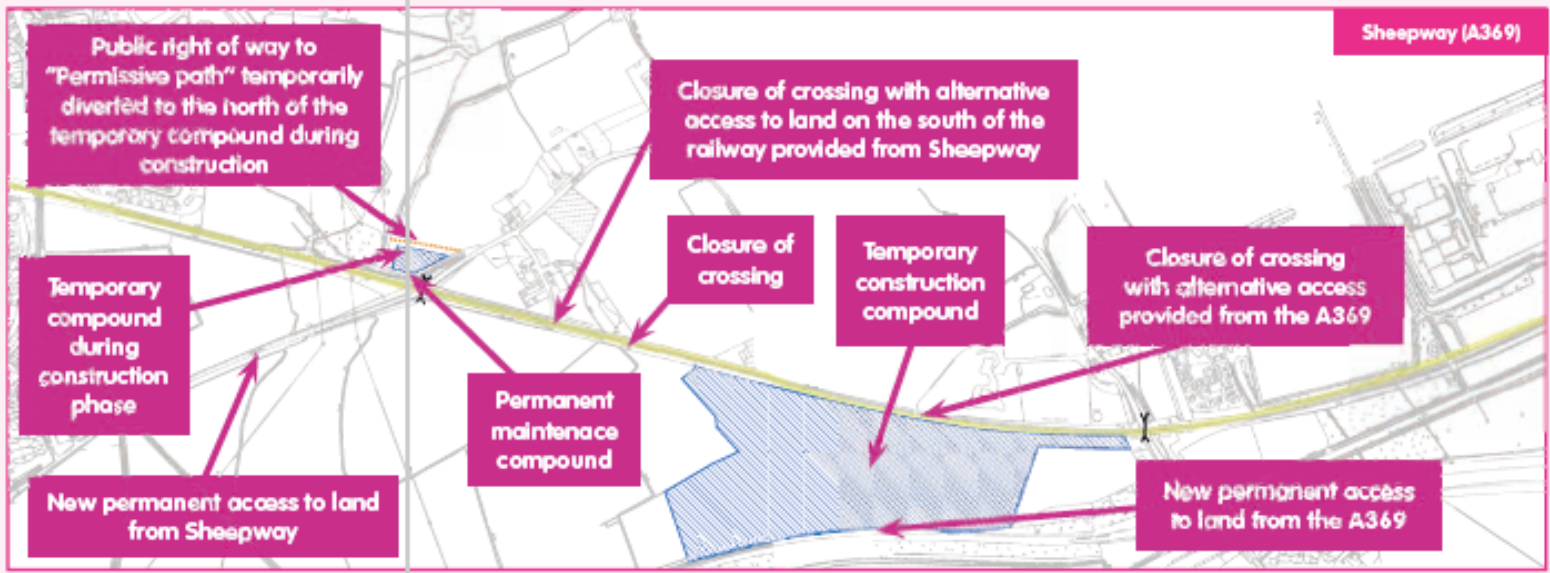
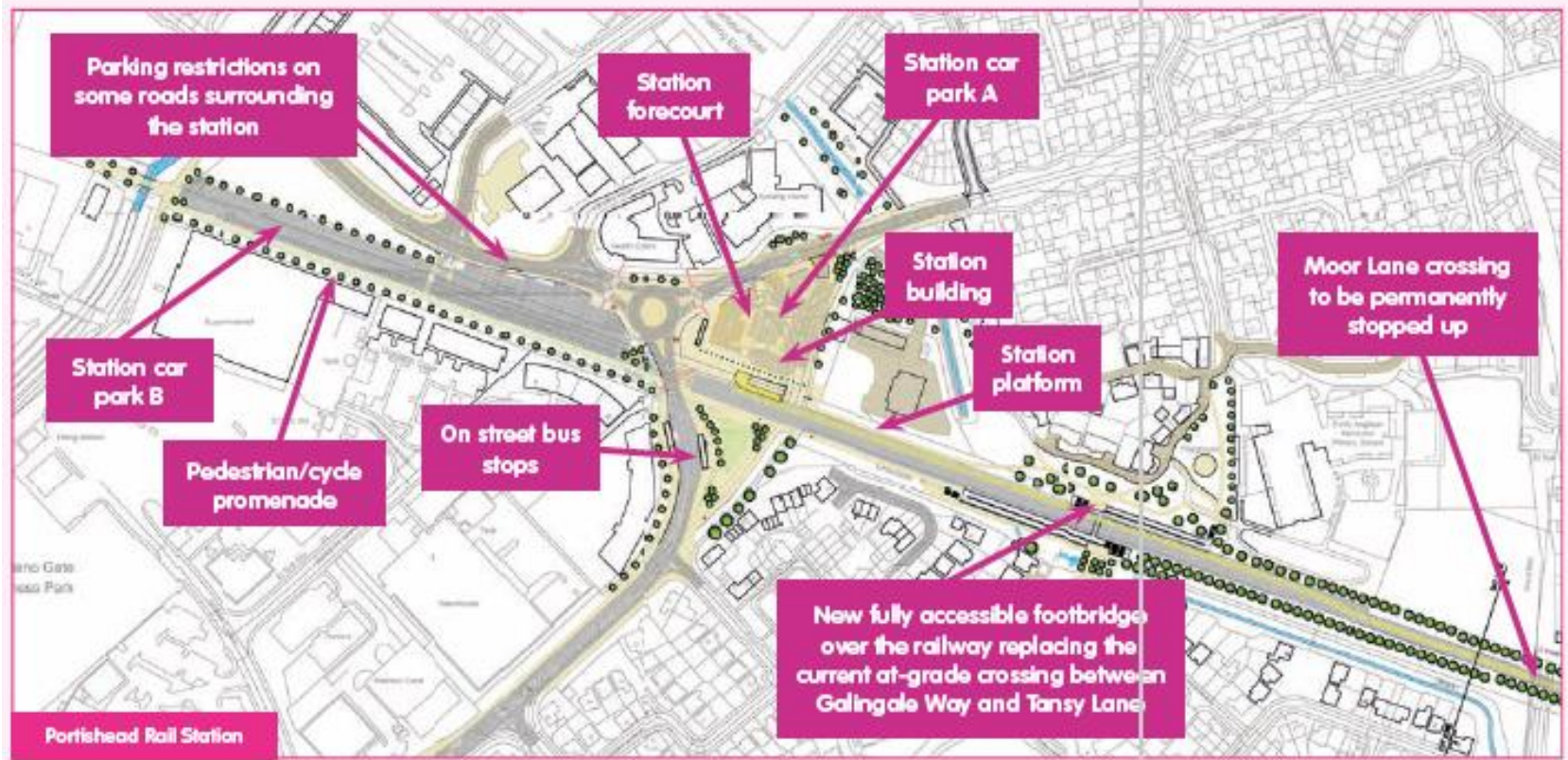


Key figures to illustrate the Scheme. Please refer to the Consultation Leaflet for a full set of figures.

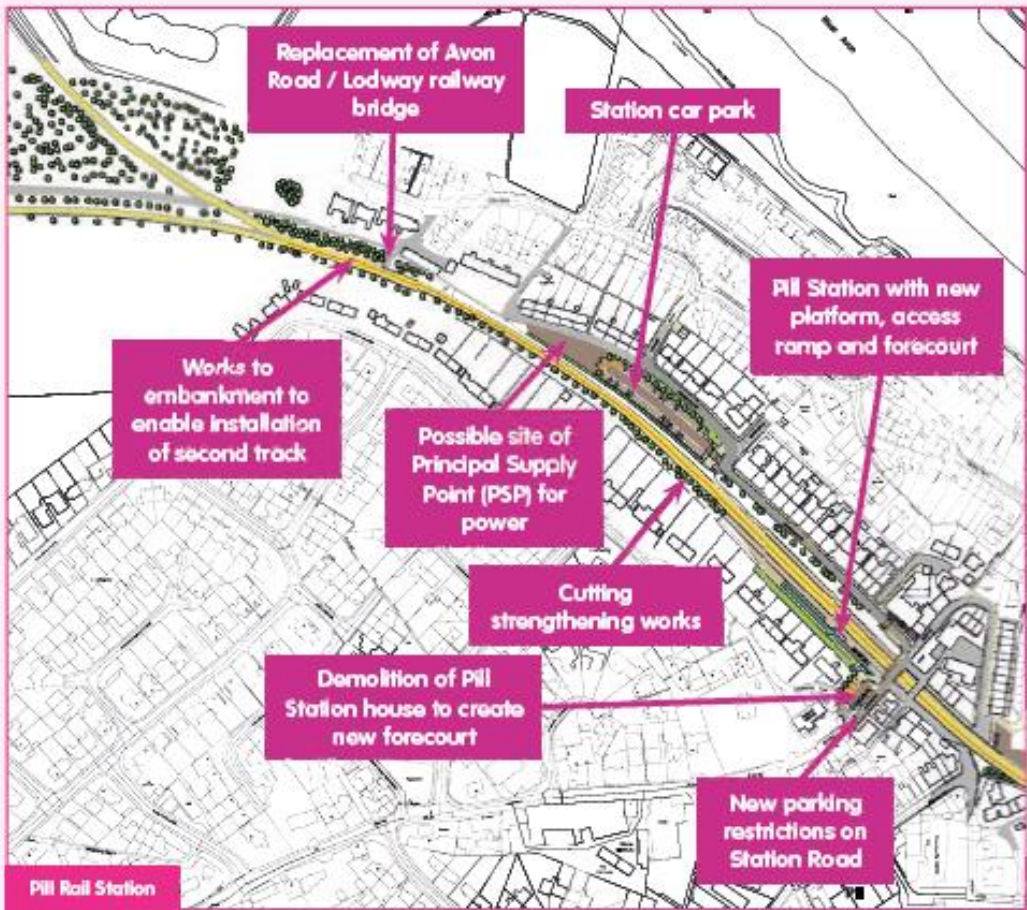
Section 1 Portishead to Royal Portbury Dock



Section 1 Portishead to Royal Portbury Dock (...continued)



Section 3 Pill to Ham Green







## 1.3 Scheme Development and Alternatives Considered

- 1.3.1 Proposals to re-open the Portishead Branch Line date from the early 1990s, when consideration was given to the possibility of a rail scheme along the disused railway corridor. In the late 1990s and early 2000s, the possible options were widened to include a park and ride at Portbury and bus options. The reinstatement of the rail line for passenger use was the subject of Policy 4 (U) and Policy 15 of the Joint Replacement Structure Plan – West of England Partnership (including North Somerset) 2002.
- 1.3.2 In 2002, part of the Portishead Branch Line was re-opened for freight trains to Pill along with a new half kilometre section of railway from Pill to Royal Portbury Dock.
- 1.3.3 In 2005, Quays Avenue in Portishead was built across the safeguarded rail alignment on the presumption that a rail level crossing would be acceptable and deliverable should the rail scheme be taken forward. Quays Avenue was built to provide access for new housing developments off Phoenix Way without going along Harbour Road and the town centre.
- 1.3.4 In 2008 North Somerset District Council purchased the track-bed from Portishead to Portbury to safeguard the alignment for a transportation corridor. Further engineering feasibility studies for a new railway line were undertaken in subsequent years.
- 1.3.5 Alternative railway alignments for the DCO Scheme have not been considered because:
- North Somerset District Council and Network Rail between them own the land forming the former railway corridor;
  - all the principal structures required for the railway are already in place;
  - the railway is on a relatively straight alignment between Portishead and the connection to the existing rail network at Portbury Dock Junction; and
  - the corridor has been reserved for the reinstatement of a passenger rail service in the relevant planning policy documents.
- 1.3.6 Consideration of alternatives was therefore largely restricted to the frequency of the service and specific elements of the NSIP and its associated development.
- 1.3.7 The MetroWest Phase 1 project was mobilised in 2013 and originally included proposals to operate a half hourly passenger train service on the Portishead Branch Line. The estimated capital cost of this proposal, when ascertained in early 2017, was substantially greater than the available budget and currently unaffordable. As a result, the four West of England councils determined to take a staged approach to the delivery of the MetroWest Phase 1 project. The proposals for the Severn Beach Line and Bath Spa to Bristol Line remain unchanged. The proposals for the Portishead Branch Line are to be delivered in two stages. The initial stage is to deliver infrastructure to operate an hourly or hourly plus service. It is envisaged that a second stage will be promoted separately at some point after the delivery of the initial stage, to upgrade the infrastructure to operate a half hourly passenger train service. This second stage will require separate statutory processes, business case and funding package and will not be progressed until after the delivery of the initial stage. There is currently no estimated delivery date for the second stage.
- 1.3.8 The main alternatives considered for the DCO Scheme are summarised below.
- The location for Portishead station. Three locations for the station were considered, Option 1 located near the town centre, Option 2 located across Quays Avenue, and Option 3 towards the edge of the built-up area of Portishead. The public was consulted on these three options in 2013. Option 1 is no longer feasible because current policy is to close level crossings and not permit new ones on safety grounds. Option 3 would introduce a new source of activity in a residential area and was not

popular with the public. Option 2 was taken forward for further study and a second public consultation on three sub-options. The Council decided to take forward Option 2B, which did not require a level crossing.

- The length of the station platforms at Portishead and Pill. The initial design was for a 105 m platform to accommodate four train carriages. This was extended to 130 m to make passive provision for five train carriages in the future.
- Portishead station design and development. The layout for Portishead station is largely determined by the available footprint. The arrangement of the north car park was modified to improve the circulation, pick up and drop off points, taxi ranks and car parking spaces. The elevation of the station was modified to avoid a stepped access to the platform. The design of the public realm was developed to minimise conflicting movements between pedestrians and vehicles. The form and appearance of the station buildings evolved to reach a balance between affordability and good design.
- Trinity Primary School footbridge layout and appearance. The existing crossing has to be closed for safety reasons. An underpass is not feasible given the ground conditions and proximity to the lake on the south side. The layout of the bridge for pedestrians and cyclists is constrained by the drainage ditch and utilities nearby and the height clearance required for the trains.
- Pill station access and layout. Four options for the arrangement of Pill station were presented at a micro-consultation. The preferred option was to purchase and demolish No. 7 Station Road to create a new station forecourt and access to the platform.
- Location of the Principal Supply Point ("PSP") building for signalling works. Two options for the location of the PSP building are under consideration, one at Pill Station car park and one at the Pill Tunnel eastern portal.
- Pill tunnel Eastern Portal Compound access and layout. The initial design was to provide the temporary construction compound and permanent maintenance access point on the south side of the railway. However, locating the compound on the northern side would provide a less constrained access for large vehicles.
- Avon Gorge Line Speed. The half hourly scheme was based on a 55 mph design speed through the Avon Gorge. However, the capital cost for the engineering works required to achieve that speed is unaffordable, so a 30 mph design speed has been adopted.
- Ashton Vale Road highway access. For the half hourly scheme it was considered necessary to close the Ashton Vale Level Crossing permanently due to the amount of time the barriers would be down and provide a new access into the Ashton Vale Industrial Estate. A micro-consultation was held in March 2016 on six highway options, followed by a second micro-consultation in November 2016 on three options, comprising two of the previous options and a new option. Following the decision to go forward with the hourly scheme, it means the barriers on the level crossing will be closed for a shorter period. It was considered that with modifications to the layout of Winterstoke Road and changes in the timing of the highway traffic lights, it is no longer necessary to close the level crossing permanently or provide alternative highway access into the industrial estate.



## 1.4 Description of the Proposed Works

1.4.1 Table 1 below summarises the various elements of the NSIP and associated development works required for the Portishead Branch Line DCO Scheme

Table 1: A Summary of Works Required for the Portishead Branch Line (MetroWest Phase 1) DCO Scheme

Proposed DCO Scheme Element	Description of the DCO Scheme Element	Permanent or Temporary	Inside or Outside Operational Railway / Disused Railway Boundary	Current Land Use
<b><i>The Nationally Significant Infrastructure Project</i></b>				
A	<p>The NSIP comprises a new permanent railway approximately 5400 metres long from the junction of Quays Avenue and Harbour Road in Portishead to meet the existing Portbury Dock railway to the east of the M5 Motorway, then running parallel to the existing freight line to a new junction with the existing operational railway line between Pill Viaduct and the western portal of Pill Tunnel.</p> <p>The works include railway engineering works to:</p> <ul style="list-style-type: none"> <li>• replace the track formation,</li> <li>• repair or replace culverts,</li> <li>• repair or replace bridges and other structural assets,</li> <li>• minor earthworks and alterations to cuttings, install signalling, electrical and communication systems, and works to Pill Viaduct, installation of a new railway junction (Pill Junction),</li> <li>• a noise barrier at Portishead, and</li> <li>• fencing.</li> </ul>	Permanent	Mainly inside operational railway/disused railway boundary	<p>Disused railway line between Portishead and Portbury Junction.</p> <p>Through Pill the new railway will be laid next to the existing freight line.</p>
<b><i>Associated Development</i></b>				
B	The construction of a car park to the south of Harbour Road and to the west of Quays Avenue, Portishead (car park B) and pedestrian / cycling path.	Permanent	Both inside and outside the disused railway boundary	Disused railway corridor and undeveloped land.
C	Realignment of Quays Avenue, Portishead and new junction with Harbour Road.	Permanent	Outside and inside the disused railway boundary	Highway land (Phoenix Way, Harbour Road and Quays Avenue) and undeveloped land.
D	A new railway station comprising platform, shelter, ticket office and waiting area, public toilet, lighting columns and railway communications mast, to the east of the realigned Quays Avenue, Portishead.	Permanent	Outside the disused railway boundary	Highway land (Quays Avenue) and undeveloped land.

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Proposed DCO Scheme Element	Description of the DCO Scheme Element	Permanent or Temporary	Inside or Outside Operational Railway / Disused Railway Boundary	Current Land Use
E	Car park (car park A) taxi and bus facilities on the eastern side of the realigned Quays Avenue and south of Phoenix Way Portishead.	Permanent	Outside the disused railway boundary	Highway land (Quays Avenue).
F	New pedestrian and cycle paths to the north and south of the new railway to connect Quays Avenue with the new pedestrian and cycle bridge west of Trinity Primary School.	Permanent	Inside and outside the disused railway boundary	Disused railway and open space.
G	A new pedestrian and cycle bridge west of Trinity Primary School, Portishead over the Portishead Branch Line.	Permanent	Inside and outside the disused railway boundary	Disused railway and open space.
H	A path south of the Portishead Branch Line to connect the new pedestrian and cycle bridge to Galingale Way, Portishead.	Permanent	Outside the disused railway boundary	Permissive Footpath and open space.
I	A path north of the Portishead Branch Line Railway to connect the new pedestrian and cycle bridge north to Tansy Lane, Portishead.	Permanent	Outside the disused railway boundary	Permissive Footpath and open space – amenity grass with occasional shrubs and trees.
J	Construction haul road on south side of, and parallel to, Portishead Branch Line Railway, south of Fennel Road to the highway known as Sheepway.	Temporary	Outside the disused railway boundary	Agricultural land.
K	A new maintenance compound and road rail access point to the Portishead Branch Line Railway from the north side of the highway known as Sheepway and on the northern side of the railway, close to the overbridge carrying the highway known as Sheepway over the railway, opposite Sheepway Gate Farm, Sheepway.	Permanent	Outside the disused railway boundary	Pasture and path.
L	Construction compound and access from the highway from Sheepway, on the north side of Sheepway and northern side of the Portishead Branch Line Railway opposite Sheepway Gate Farm, Sheepway.	Temporary	Outside the disused railway boundary	Agricultural land.

Table 1: A Summary of Works Required for the Portishead Branch Line (MetroWest Phase 1) DCO Scheme

Proposed DCO Scheme Element	Description of the DCO Scheme Element	Permanent or Temporary	Inside or Outside Operational Railway / Disused Railway Boundary	Current Land Use
M	Construction haul road on south side of, and parallel to, the Portishead Branch Line Railway, west from the highway of Sheepway to the proposed construction compound north of the Portbury Hundred highway.	Temporary	Outside the disused railway boundary	Agricultural land.
N	Construction compound between north of The Portbury Hundred highway and the Portishead Branch Line Railway and west of the junction of Station Road with Portbury Hundred, Portbury.	Temporary	Outside the disused railway boundary	Agricultural land.
O	Permanent improvements to the access from The Portbury Hundred highway to the field to the south of Portishead Branch Line and west of Station Road, Portbury.	Permanent	Outside the disused railway boundary	Highway and agricultural land.
P	Turning circle east of The Drove on the South side of the Portishead Branch Line	Temporary	Outside the disused railway boundary	Agricultural land.
Q	Car parking spaces for Network Rail for use during maintenance and improvement of car parking spaces for Wessex Water.	Permanent	Outside the disused railway boundary	Informal parking areas.
R	Alteration to existing bridleway crossing at Royal Portbury Dock Road and alterations to National Cycle Route 26 at the Portishead Branch Line Railway underbridge.	Permanent	Inside the disused railway boundary	Bridleway and disused railway.
S	Alterations to permissive path comprising National Cycle Route 26 at Marsh Lane underbridge, Portbury.	Permanent	Inside the disused railway boundary	Cyclepath and disused railway.
T	Haul road on the North side of railway from Marsh Lane to Cattle Creep Bridge and on to the proposed construction compound under the M5.	Temporary	Outside the disused railway boundary	Cyclepath and bridleway along the disused railway
U	A temporary construction compound under the M5 bridge.	Temporary	Outside the disused railway boundary	Wasteland under the M5 bridge.
V	Vehicular Access on South side of railway from Marsh Lane east to the Cattle Creep accommodation underbridge on the Portishead Branch Line to the West of the M5 Motorway	Temporary vehicular construction access and permanent access on foot.	Outside the disused railway boundary	Agricultural land.

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Proposed DCO Scheme Element	Description of the DCO Scheme Element	Permanent or Temporary	Inside or Outside Operational Railway / Disused Railway Boundary	Current Land Use
W	Alterations to permissive path comprising part of National Cycle Route 26 at the Portishead Branch Line Railway underbridge beneath the M5 Motorway.	Permanent	Inside the disused railway boundary	Disused railway and cyclepath.
X	New bridleway under the M5 Motorway Avonmouth Bridge east to the existing National Cycle Route 41 from Pill to Avonmouth.	Permanent	Outside the operational railway boundary	Cyclepath, scrub and wasteland.
Y	Construction compound at Lodway Farm with highway access from Marsh Lane east via the Portishead Branch Line Railway bridge under the M5 Motorway and also access via The Breaches (Pill).	Temporary	Outside the operational railway boundary	Agricultural land.
Z	Avon Road embankment strengthening works and temporary access to the south of the Portishead Branch Line through back gardens off Lodway Close.	Temporary	Inside and outside the operational railway boundary	Agricultural land and residential gardens.
AA	Demolition and reconstruction of the Avon Road Underbridge in Pill.	Permanent	Inside and outside the operational railway boundary	Existing underbridge and footpath between Avon Road and Lodway Close.
AB	Temporary diversion of NCN 41 on North side of the Portishead Branch Line and temporary construction compound alongside the railway.	Temporary	Outside the operational railway boundary	NCN 41 and pedestrian access and Jenny's Meadow.
AC	Demolition of existing garages, and a temporary construction compound on the north side of the Portishead Branch Line Railway to the South of Avon Road, Pill	Temporary compound	Outside the operational railway boundary	Highway, yard and residential garages.
AD	Demolition of wall fronting residential property known as Victoria House, Marine Parade, Pill to facilitate access for crane to construct the underbridge to the south of Avon Road, Pill	Temporary demolition and reinstatement	Outside the operational railway boundary	Residential
AE	Car park to serve Pill Station, to the south of Severn Road and Monmouth Court, Pill. Site for a new PSP for the railway.	Permanent	Outside the operational railway boundary	Disused former railway goods yard.

**Table 1: A Summary of Works Required for the Portishead Branch Line (MetroWest Phase 1) DCO Scheme**

<b>Proposed DCO Scheme Element</b>	<b>Description of the DCO Scheme Element</b>	<b>Permanent or Temporary</b>	<b>Inside or Outside Operational Railway / Disused Railway Boundary</b>	<b>Current Land Use</b>
AF	Temporary construction compound at Pill Yard, the proposed site of Pill station car park.	Temporary	Outside the operational railway boundary	Disused former railway goods yard.
AG	New station on the site of the southern platform of the former station at Pill and new station forecourt on the site of 7 Station Road Pill (to be demolished), together with re-profiling and associated strengthening works to cutting slope to the rear of properties fronting Sambourne Lane and Hardwick Road, new access from the station forecourt to the platform, new platform with shelter and lighting, and fire refuge area down track of the platform.	Permanent	Inside and outside the operational railway boundary	Disused Pill station and residential / commercial property.
AH	Temporary construction compound in area proposed for the new Pill station forecourt.	Temporary	Outside the operational railway boundary	House and commercial property
AI	Temporary construction compound at Pill Library car park and access onto the highway known as Underbanks.	Temporary	Outside the operational railway boundary	Pill library car park and highway
AJ	Embankment strengthening works on the east side of Pill Viaduct to the rear of property off Mount Pleasant.	Permanent	Inside the operational railway boundary	Existing embankment on the operational railway.
AK	New Pill Junction between Pill Viaduct and the western portal of Pill tunnel where the existing and new railway tracks combine to the single track.	Permanent	Inside the operational railway boundary	Existing operational railway

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AL	<p>Railway engineering works from Pill Junction, to the west of the western portal of Pill Tunnel, to Ashton Junction. These works include:</p> <ul style="list-style-type: none"> <li>• 6 micro-compounds along the Avon Gorge with basic welfare facilities</li> <li>• alterations to the track, including vertical and horizontal alignment,</li> <li>• replacing sleepers, ballast cleaning, and geotechnical works,</li> <li>• repairing and replacing culverts,</li> <li>• minor works to tunnels,</li> <li>• repairing or replacing bridges and other structural assets, minor earthworks and alterations to cuttings and embankments,</li> <li>• loose rock picking of cliff faces,</li> <li>• installing an intermediate signal,</li> <li>• replacing the signalling and electrical systems,</li> <li>• installing a train driver communication system,</li> <li>• replacing fencing along the railway alignment and</li> <li>• new maintenance access points from the existing River Avon Tow Path to the Portishead Branch Line Railway.</li> </ul>	Permanent	Inside the operational railway boundary	Operational railway land
AM	Site for the new PSP building, compound, road rail access point and associated access road from the highway of Chapel Pill Lane, Ham Green North of the eastern portal of Pill Tunnel.	Permanent	Outside the operational railway boundary	Pasture land.
AN	Construction compound and rail access off Chapel Pill Lane.	Temporary	Outside the operational railway boundary	Pasture land.
AO	Route for new electricity cables to connect the existing Distribution Network Operator's cables at Chapel Pill Lane overbridge, Ham Green, to the Portishead Branch Line Railway at the site for the PSP off Chapel Pill Lane.	Permanent	Outside the operational railway boundary	Private means of access.
AP	Permanent access to the South of the operational railway from Chapel Pill Lane to the Portishead Branch Line near Miles Underbridge.	Permanent	Outside the operational railway boundary	Agricultural land



Table 1: A Summary of Works Required for the Portishead Branch Line (MetroWest Phase 1) DCO Scheme

Proposed DCO Scheme Element	Description of the DCO Scheme Element	Permanent or Temporary	Inside or Outside Operational Railway / Disused Railway Boundary	Current Land Use
AQ	Works to Quarry Underbridge No. 2.	Permanent	Inside the operational railway boundary	Underbridge and access
AR	Construction compound on West side of the operational railway adjacent to Quarry Underbridge No. 2.	Temporary	Inside and possibly outside the operational railway boundary	Underbridge and access
AS	A new vehicular maintenance road rail access point from the highway of Clanage Road, Bower Ashton to the Portishead Branch Line Railway.	Permanent	Outside the operational railway boundary	Private sports field.
AT	Construction compound at Clanage Road in Bower Ashton.	Temporary	Outside the operational railway boundary	Private sports field.
AU	Provision of a ramp to the west of the Portishead Branch Line Railway and north of the Ashton Vale Level Crossing to connect pedestrians and cyclists between Ashton Vale Road and Ashton Road (A370).	Permanent	Inside the operational railway boundary	Operational railway land.
AV	Extension of left turn flare lane on Winterstoke Road onto Ashton Vale Road and optimisation of the Ashton Vale Road signals and upgrade of signals to "MOVA" (Microprocessor Optimised Vehicle Actuation) and comprises of both hardware and software which responds to live traffic volumes to adjust and optimise the timing of traffic signal phases to make best use of the available capacity.	Permanent	Outside the operational railway boundary	Highway
AW	Permanent closure of Barons Close pedestrian level crossing (currently closed temporarily during the construction of AVTM MetroBus). Alternative pedestrian access along pedestrian and cycle path under construction by MetroBus scheme linking to the Ashton Vale Road level crossing and the proposed MetroWest Phase 1 pedestrian / cycle ramp.	Permanent	Inside and outside the operational railway boundary	Railway and highway

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Proposed DCO Scheme Element	Description of the DCO Scheme Element	Permanent or Temporary	Inside or Outside Operational Railway / Disused Railway Boundary	Current Land Use
<b><i>Associated Development at Royal Portbury Dock</i></b>				
AX	Replacement of the signalling equipment of the half kilometre section of railway from Portbury Dock to Portbury Dock Junction, within the land of the Bristol Port Company.	Permanent	Inside the operational railway boundary	Port operational land.

1.4.2 Elements A to AK, AM to AR, and AX lie within the North Somerset District Council local government boundary. Works Nos. AS to AW are within the Bristol City Council local government boundary. Work No. AL straddles both local government boundaries.

1.4.3 Other works will also be required in connection with the NSIP and associated works comprising:

- electrical equipment, principal supply points and cables, telecommunications cables and equipment and signalling works,
- embankment, aprons, abutments, shafts, foundations, retaining walls, drainage, wing walls, fences and culverts,
- works to alter the position of apparatus, including mains, sewers, drains and cables,
- works to interfere with a watercourse other than a navigable watercourse,
- landscaping and other works to mitigate any adverse effects of the construction, maintenance or operation of the authorised development,
- works required for the, improvement, maintenance of any streets,
- works for the temporary diversion of public footpaths shown in the footpath stopping up and diversion plan, and
- such other works, including working sites and works compounds as may be necessary or expedient for the purposes of or in connection with the construction of the authorised development.

1.4.4 The associated works required for the DCO Scheme within the Avon Gorge Woodlands SAC are limited to relatively minor railway engineering works to upgrade the operational railway line and almost all of the permanent works are within the Network Rail operational boundary. One exception is the possible requirement for works outside the operational boundary in order to undertake remedial works to Quarry Underbridge No. 2.

1.4.5 The total area of land required for the DCO Scheme is about 80.3 ha, comprising, approximately 50.1 of permanent land take, 27.4 ha of temporary land required for construction, 2.4 ha for permanent rights and 0.4 ha for subsoil rights. These estimates will be revised as the scheme design develops.

1.4.6 North Somerset District Council intends to transfer ownership of the land comprising railway assets to Network Rail on or before completion of construction of the DCO Scheme. The car parks will be retained by North Somerset District Council.

## Development of the Design and Environmental Mitigation

- 1.4.7 The feasibility design for the highway works is being led by North Somerset District Council and is largely completed. The feasibility design for the railway works required for the half hourly design was completed in early 2017. It has been necessary to review the associated development works required along the operational railway between Pill Junction and Ashton Junction for the hourly scheme and those design studies are ongoing.
- 1.4.8 An iterative design process has been undertaken, with mitigation measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment, being incorporated into the DCO Scheme where appropriate.
- 1.4.9 A number of measures have been included as part of the project design in order to minimise certain environmental effects, including:
- careful designing of the project to ensure key receptors are avoided where possible;
  - construction adopting best practice techniques, which will be set out in the Code of Construction Practice ("CoCP"). This document is still being finalised and will be submitted with the DCO application and the successful contractor(s) will be required to prepare and implement a Construction Environmental Management Plan ("CEMP") to demonstrate how they will comply with the CoCP; and
  - compliance with regulatory and legislative regimes as required by law.
- 1.4.10 Other mitigation measures are being considered where adverse (but not significant effects in regards to the EIA Regulations) are identified. These measures are currently being finalised to assess whether they are feasible to include as part of the scheme.

## Construction Phase

- 1.4.11 The current programme anticipates that construction would commence in spring 2020 with the DCO Scheme opening in late 2021.
- 1.4.12 The likely phasing of the construction works is to undertake the highways works in Portishead first in order to release land for the construction of Portishead Station. The area demarcated for car park A could be used as a temporary construction compound. Portishead station and Trinity Primary School footbridge would be built, followed by the formation of the railway. Car parks A and B would be built towards the end of the construction phase. Pill car park will be constructed towards the end of the construction phase of the railway and station.
- 1.4.13 The single track disused railway between Portishead station and Portbury Dock Junction will be reconstructed over all of its approximately 5 km length. Access and welfare points will primarily be located at Portishead Station, Sheepway compound and the Lodway Farm compound.
- 1.4.14 The railway tracks from Portishead and Royal Portbury Dock will run parallel through Pill before converging in to a single railway at Pill Junction. Access and welfare locations for the works to this section will include Lodway Farm Compound, Pill Station car park and Ham Green compound.
- 1.4.15 The section between Pill Junction and Ashton Junction is currently single track with a 30 mph line speed. Much of this section runs through the Avon Gorge and includes a number of tunnels, under-bridges and over-bridges. Ongoing design indicates this section will remain single track, with a 30 mph maximum line speed, running approximately along the alignment of the existing freight line corridor. Some activities likely to be undertaken in order to achieve a track design that is suitable for passenger use include minor slewing, tamping, track lifting, re-railing, re-ballasting and sleeper replacement.

- 1.4.16 Key access and welfare locations for the works to this section may include Lodway Farm Pill Station car park, Ham Green compound, Clanage Road compound, and Liberty Lane depot. There will also be a number of pedestrian track access and micro-welfare points installed throughout the Avon Gorge, approximately at 1 km intervals as ground conditions and topography allow.
- 1.4.17 The railway works along the operational railway between Pill and Ashton Junction will require daytime and night-time works in shifts, and potentially at least one blockade of several weeks. This could potentially disturb lineside neighbours, especially in built up areas such as Pill where residential property lies close to the railway.
- 1.4.18 The railway works along the disused railway are likely to be undertaken during the day-time as there is no need for railway possessions.
- 1.4.19 Highway works for local highways authorities are typically undertaken between 0800 and 1800 during weekdays and on Saturday mornings. Construction works outside these hours are usually not permitted except by prior approval from the highways authority.

### Operations Phase

- 1.4.20 A new passenger train service will be provided between Portishead, Pill and Bristol Temple Meads over the likely operational hours of 0600 to 2400, subject to further development of the business case and contractual arrangements with the train operator. The proposed passenger service will take 23 minutes between Portishead and Bristol Temple Meads. The dwell times will be 3 minutes in Portishead and 30 seconds in Pill.
- 1.4.21 Freight trains will continue to operate and Royal Portbury Dock will continue to have their existing agreed train paths. Where necessary freight trains will be required to wait on the Portbury Dock spur line for clearance prior to despatch in the 'Up' direction (to Bristol) or at the Bedminster Down Relief Line in the 'Down' (to Portbury Dock). Freight trains will be limited to a maximum of 30 mph throughout the entire branch line, as is the current line speed.
- 1.4.22 Consideration is being given to the need for car parking restrictions on roads in the vicinity of Portishead station and Pill station to encourage car drivers to use the car parks provided at both stations.
- 1.4.23 All Network Rail assets are subject to routine maintenance inspections and examinations. The existing maintenance regime will be increased on the Portishead Line due to the introduction of passenger services between Parson Street Junction and Portishead.
- 1.4.24 The train operating company will be responsible for activities in the stations such as cleaning, the removal of solid waste and litter, and maintaining utility connections.

### Decommissioning Phase

- 1.4.25 No specific plans have been formulated for the decommissioning phase of the Portishead Branch Line and it is expected that the services will continue for as long as there is a business case for doing so.

### Other Works for MetroWest Phase 1

- 1.4.26 Certain works on the national rail network will be carried out under Network Rail's permitted development rights, which will also facilitate MetroWest Phase 1. These works do not form part of the DCO Application, and are not being consulted on, but they have been taken into consideration in the assessment of cumulative effects and are described below for completion.

- 1.4.27 Liberty Lane Freight Depot (MetroWest Phase 1): A buffer stop and trap points are required at the depot entrance, within the sidings to enable the continuation of the existing freight train shunting movements from the depot across Parson Street Junction onto the Up-Relief Line. These works are within Network Rail's operational boundary and will be implemented using their General Permitted Development rights. These works must be completed before the Portishead Branch Line DCO Scheme starts operating.
- 1.4.28 Parson Street Junction (MetroWest Phase 1): Part of the existing junction (switches and crossovers) needs to be renewed which entails replacement of the track across the junction, replacement of signalling equipment and associated works. These works are within Network Rail's operational boundary and will be implemented using its General Permitted Development rights. These works must be completed before the Portishead Branch Line DCO Scheme starts operating.
- 1.4.29 Parson Street Station (MetroWest Phase 1): Minor platform works are required to use platform 3, including adjustment to the platform copers, works to improve track drainage and associated works. These works are within Network Rail's operational boundary and will be implemented using its General Permitted Development rights. These works must be completed before the Portishead Branch Line DCO Scheme starts operating.
- 1.4.30 Bedminster Down Relief Line (MetroWest Phase 1): The Down Carriage Line running from Bristol Temple Meads will be extended past Bedminster station to a new turn out on to the Down Main between Bedminster Station and Parson Street Station. The new turnout is required to enable freight trains returning to Royal Portbury Dock to be held in the southbound direction, allowing passenger trains to pass. The works will include the construction of a new crossover (turnout), renewal of approximately 1 km of track on the Down Carriage Line and associated signalling. These works are within Network Rail's operational boundary and will be implemented using its General Permitted Development rights. These works must be completed before the Portishead Branch Line DCO Scheme starts operating.
- 1.4.31 Severn Beach / Avonmouth Signalling (MetroWest Phase 1): Minor signalling works are required to enable a longer layover period for passenger trains at Avonmouth station and Severn Beach station. These works are within Network Rail's operational boundary and will be implemented using its General Permitted Development rights. These works are not required for the operation of the Portishead Branch Line DCO Scheme.
- 1.4.32 Bathampton Turnback (MetroWest Phase 1): The Bathampton Turnback will comprise a new crossover between the existing Up line to London and the Down line to Bristol. A short walkway (unsurfaced path) will be provided on the existing Up loop for train drivers to walk from one end of a train to the other end. After stopping at Bath, the local train from Bristol would continue into the Up loop at Bathampton from the Up line. The driver would then descend onto the walkway, walk to the other end of the train and mount the train, before moving forward and exiting the loop via a new signal and through the crossover to the Down line back to Bristol. All the works will be confined to Network Rail's existing land holding and will be undertaken by Network Rail under its General Permitted Development rights. These works are not required for the operation of the Portishead Branch Line DCO Scheme.

## 1.5 Approach to the Environmental Statement

- 1.5.1 The objective of environmental impact assessment ("EIA") is to provide information to the decision-makers on the potential impact of the scheme on people, affected communities, and the environment. These matters can then be taken into consideration by the relevant authorities during the examination of the application for the scheme. The information that

the developer is required to provide is presented in the Environmental Statement ("ES") which is submitted with the application for development consent.

- 1.5.2 The general approach to the preparation of the ES, once the project design has been determined, is based on the following steps:
- Data review to draw together readily available information about the study area, the project and likely environmental effects;
  - Screening to determine whether an EIA is required under the regulations;
  - Scoping to identify the issues to be addressed and how they are to be assessed;
  - Baseline data collection and specially commissioned surveys to characterise the existing conditions;
  - Consultation with the local authorities, the statutory environmental bodies, other consultee bodies and the general public to request data, inform third parties of the proposals, and seek feedback on the scheme;
  - Identification and assessment of the magnitude of predicted impacts of the DCO Scheme on identified receptors to evaluate the significance of the impacts;
  - Describe measures proposed to mitigate likely significant effects as well as any measures proposed to reduce or avoid effects that are not significant;
  - Assess the significance of the residual effects of the mitigated DCO Scheme; and conclude whether there are likely significant effects for the purposes of the EIA Regulations;
  - Assess the in combination and cumulative effects of the scheme with other projects;
  - Present the assessment in the ES.
- 1.5.3 A Scoping Report and a Baseline Report were issued to The Planning Inspectorate in June 2015 setting out the proposed approach to the EIA and additional baseline material. These reports, together with the Scoping Opinion issued by The Planning Inspectorate can be downloaded from the following site:  
<https://infrastructure.planninginspectorate.gov.uk/projects/south-west/portishead-branch-line-metrowest-phase-1/?ipcsection=docs>
- 1.5.4 The PEI Report presents the information that the applicant has to provide to inform stakeholders about the DCO Scheme during the statutory consultation. The PEI Report presents the assessment available at this stage and will form the basis of the ES, which will be submitted to The Planning Inspectorate as part of the DCO application for the Scheme in 2018. The PEI Report is presented in four volumes, with this volume comprising the non-technical summary.
- 1.5.5 To-date, the EIA process for the DCO Scheme has been undertaken in accordance with The Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (as amended) ("the EIA Regulations"). However, the DCO Scheme is giving consideration to – and will seek to apply, where possible – the revised regulations entitled The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 ("the EIA Regulations 2017") which transpose the EIA Directive (2014/52/EU) amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment.
- 1.5.6 The approach to the impact assessment is largely based on the Highways Agency's Design Manual for Roads and Bridges ("DMRB") Volume 11 Environmental Assessment and Volume 10 Environmental Design and Management. Although the DMRB is for highway schemes, it provides a useful basis for the environmental assessment of other linear



transport schemes including railways. The approach set out in DMRB is supplemented by other widely accepted methodologies published by other professional organisations. The ES will also accord with the requirements of Network Rail's requirements for environmental assessment and their Governance for Rail Investment Projects ("GRIP") procedures.

- 1.5.7 The Planning Act 2008 requires extensive consultation with the local authorities, persons with an interest in the land and affected communities. To date non-statutory consultations have been undertaken, including:
- Public exhibitions in 2014 on options for the location of Portishead station.
  - Public exhibitions in 2015 focusing on initial proposals for the railway between Portishead and Pill.
  - Micro-consultations held in Pill and Ashton Gate in March 2016.
  - Micro-consultation at Ashton Gate in November / December 2016.
- 1.5.8 Considerable engagement with specific organisations has taken place, including landowners directly affected by the works, environmental and planning organisations and utility companies.
- 1.5.9 Statutory consultation as required under the Planning Act 2008 under Section 42 ("s42") with statutory consultees, local authorities, landowners and significantly affected persons, and s47 with local communities, is being undertaken from 23 October 2017 to 4 December 2017. The issues coming out of the consultation relating to the people, communities and the environment will be considered and the findings will be presented in the ES setting out the key issues, how they were assessed, and the outcome of the assessment.
- 1.5.10 In parallel with the EIA process, a Habitats Regulations Assessment ("HRA") is being undertaken for European sites and protected species as required under Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Flora and Fauna ("the Habitats Directive"). The ecological sites of interest are:
- The Severn Estuary Special Protection Area ("SPA"), SAC, and Ramsar site
  - The Avon Gorge Woodlands SAC
  - The North Somerset and Mendip Bats SAC
  - The Bath and Bradford-on-Avon Bats SAC
- 1.5.11 A draft HRA screening report was submitted to The Planning Inspectorate for the DCO Scheme in the Scoping Report. The HRA screening report is being updated and will be provided in the ES to accompany the DCO application.

## 1.6 The Planning Framework

- 1.6.1 An appraisal of the DCO Scheme's compliance with planning policy will be set out in the Planning Statement accompanying the DCO Application. Primary consideration will be given to the provisions of the National Policy Statement for National Networks ("NPSNN"), dated December 2014 and the National Planning Policy Framework ("NPPF").
- 1.6.2 The DCO Scheme passes through North Somerset District Council's administrative boundary between Portishead and Clifton bridge over the railway line between Clanage Road and the River Avon Tow Path and through Bristol City Council administrative boundary from Clifton Bridge to the end of the DCO Scheme in Ashton Junction and continuing on along the railway to Bristol Temple Meads railway station.

- 1.6.3 The proposed location of Portishead station and the railway corridor have been safeguarded in local policy plans for over a decade.
- 1.6.4 North Somerset District Council and Bristol City Council have promoted public transport, with the construction of the Ashton Vale to Temple Meads Bus Rapid Transit connecting into the Long Ashton Park and Ride near Ashton Gate and the South Bristol Link. Both of these schemes form part of the MetroBus network. The former Alderman Moore's Allotments off Silbury Road and adjoining the railway corridor have been allocated for housing, and would be served by MetroBus.
- 1.6.5 Both North Somerset District Council and Bristol City Council have policies to protect the natural environment, including sites of nature conservation sites and geological and geomorphological sites, as well as cultural heritage and the built environment, such as archaeological sites, conservation areas and listed buildings. There are also policies to avoid unsuitable development in flood risk areas and a presumption against unsuitable development in the Green Belt, which has been designated to protect the countryside from the expansion and coalescence of urban areas. The main environmental planning constraints are illustrated in Figure 1.
- 1.6.6 The West of England Joint Spatial Plan will provide a framework for delivering up to 105,000 net additional homes between 2016 and 2036, across the four West of England authorities, North Somerset, Bristol City Council, South Gloucestershire, and Bath and North East Somerset. The consultation plan points to strategic development locations to the south of the study area in Nailsea, Backwell, the M5 to A38 transport corridor and south east Bristol. To the North of the study area the locations are in the North and East fringe of Bristol (South Gloucestershire). There will be urban intensification of Bath, Bristol, the North and East fringe and Weston-super-Mare. There will also be strategic employment locations in Avonmouth, Bristol, Bath, Weston-super-Mare and Somer Valley. These requirements point to future trends of increasing urbanisation and the need for improved transport links between the new development and employment centres.

## 1.7 Air Quality

- 1.7.1 The DCO Scheme passes through a small section of the Bristol Air Quality Management Area ("AQMA") in the vicinity of Brunel Way in Ashton Gate and future services on the DCO Scheme will pass through the Bristol AQMA along the south west main line between Parson Street Station and Bristol Temple Meads. The Bristol AQMA has been declared due to exceedances of nitrogen dioxide. The air quality along the majority of the DCO Scheme is well within the air quality objectives and there are no AQMAs in North Somerset.
- 1.7.2 During construction, air quality may deteriorate due to dust and to a lesser extent emissions from plant and vehicles. The assessment of construction dust will be undertaken once the railway design and construction strategy has been completed. Notwithstanding, the impacts of dust are usually confined to within 200 m of the construction boundary and occur intermittently depending on the type of construction works being undertaken and the weather, with higher risk during periods of dry, windy weather. The impacts of construction on air quality will be managed through measures to control dust from construction sites which will be set out in the CoCP. With the implementation of best practice measures to control dust and emissions, the effect on construction dust on people, communities and the environment is assessed as **not significant**.
- 1.7.3 The proposed hourly plus services along the Portishead Branch Line is not a heavily trafficked route. No exceedances of the air quality objectives for nitrogen dioxide and particulate matter were found, reflecting the low background levels of air pollutants and negligible to slight increases in nitrogen dioxide caused by the DCO Scheme. The effect of

the DCO Scheme during operations is not predicted to be significant in relation to the EIA Regulations.

- 1.7.4 The overall effect of the DCO Scheme on air quality during construction and operation is assessed as **not significant**.

## 1.8 Cultural Heritage

- 1.8.1 North Somerset and Bristol City are long settled resulting in a rich variety of cultural heritage assets, including scheduled monuments, archaeological sites, conservation areas, listed buildings, parks and gardens and non-designated heritage features.
- 1.8.2 There are three scheduled monuments within 0.5 km of the DCO Scheme all located in the Avon Gorge; Stokeleigh Camp, which lies in Leigh Woods on the western side of the Avon and about 120 m from the railway corridor and, on the east side of the gorge, the site of the Roman settlement of *Abonae* at Sea Mills and an Iron Age hill fort at Clifton Down Camp. One scheduled monument, a hill fort at Conygar Hill, lies about 550 m south of the disused railway corridor between Portishead and Pill potentially with views over the DCO Scheme.
- 1.8.3 The railway corridor does not pass through any conservation areas. There are potential views of the DCO Scheme from the periphery of the six conservation areas in Bristol, which are from north to south, Shirehampton, Sea Mills, Sneyd Park, The Downs, Clifton and Hotwells, and the City Docks. The DCO Scheme runs along the eastern boundary of the Bower Ashton conservation area and the proposed Clanage Road construction compound is located within it. There are no views of the DCO Scheme from Leigh Woods conservation area.
- 1.8.4 There are many listed buildings within 0.5 km of the DCO Scheme, most of them located in the conservation areas, but only a few are located within 50 m and none within the proposed footprint of the DCO Scheme itself.
- 1.8.5 The most famous listed building is the Clifton Suspension Bridge, a Grade I listed structure, which crosses the Avon Gorge connecting Clifton in Bristol with the village of Leigh Woods (Plate 2). The railway corridor lies in tunnel at the foot of the bridge on the western bank of the River Avon.
- 1.8.6 There are 12 listed buildings within 0.5 km of the railway corridor between Portishead and Pill, most of which do not have views of the railway due to the low lying topography and intervening hedgerows and trees. One exception is Court House Farm, a Grade II listed building with limited views of the disused railway corridor given the surrounding farm buildings, hedgerows and row of poplar trees along the railway itself.
- 1.8.7 There are a number of listed buildings in and around Pill, which have restricted or no views towards the railway. There are many listed buildings on the outskirts of Bristol with panoramic or oblique medium to long distance views over the River Avon towards the DCO Scheme.



Plate 2: View from Clifton Down Camp south towards the Clifton Suspension Bridge

- 1.8.8 The operational railway corridor passes through the Leigh Court Registered Park and Garden and close to Ashton Court Registered Park and Garden, which are both located on the western flank of the River Avon. There is also an unregistered Park and Garden associated with Ham Green hospital close to the railway on the Bristol side of Pill Tunnel.
- 1.8.9 There are also numerous non-designated heritage features close to and within the railway corridor, most notably components of railway heritage such as the remains of the Portishead branch line from the 1860s, Portbury railway station and 19<sup>th</sup> century signal box, Pill viaduct, Ham Green (Pill) Tunnel, Ham Green Halt, the site of Nightingale Valley Halt, Clifton Bridge Rail Tunnel, Clifton Bridge railway station, and Ashton Gate Halt.
- 1.8.10 The DCO Scheme would pass through or alongside historic landscape characters reflecting the changing social history in North Somerset, from late medieval enclosed open fields, to 18<sup>th</sup> to 19<sup>th</sup> century parliamentary enclosures, post-medieval designed ornamental landscapes through to 19<sup>th</sup> to 20<sup>th</sup> century suburban expansion.
- 1.8.11 The construction of the DCO Scheme will result in the removal of non-designated cultural heritage in the form of existing historical railway infrastructure such as existing ballast, sleepers and rails, redundant junction boxes and signal structures. The remains of the railway platform at Pill will be partially removed and rebuilt while the northern platform will remain unchanged. Construction is unlikely to affect archaeological and heritage features that pre-date the existing railway as they were most likely destroyed during the construction of the original railway.
- 1.8.12 Network Rail will implement their procedures for the disposal of redundant railway assets including historic assets, which includes site walkouts, the recording of known assets, and the appropriate disposal of those assets. The DCO Scheme will also help to preserve structures along the railway through repair and ongoing maintenance. The loss or damage to these low value railway assets after mitigation is assessed to be **neutral**.
- 1.8.13 The DCO Scheme is assessed to have a direct **slight adverse** effect on non-designated cultural heritage assets during the enabling works and construction through the removal of known and hitherto unknown archaeological remains along the railway corridor.



- 1.8.14 The removal of vegetation and the presence of construction activities is not expected to affect the quality of the setting of heritage features between Portishead and Pill due to the lack of visibility of the DCO Scheme. The significance of the effect is **neutral** and not significant in regard to the EIA Regulations.
- 1.8.15 Through the Avon Gorge, the removal of vegetation to construct the railway and the new security fencing may result in the existing railway being more prominent in the landscape. During construction, the significance of effect of the DCO Scheme on designated heritage assets was assessed as **slight adverse** for Clifton Suspension Bridge; The Observatory in Clifton Down Camp; Sion Hill; The Paragon 1-14 and 15; Nos. 16-19 and 20 and 21 Freeland Place; and Vincent Parade, Rock House and The Colonnade on Hotwell Road. However, these adverse effects are considered to be not significant in relation to the EIA Regulations.
- 1.8.16 The construction activities at the greenfield construction compounds could damage unknown buried assets. The significance of these effects is difficult to assess as the existence and value of the resource is unknown. Given the types and value of known archaeological finds in the area, there may be at worst a **moderate adverse** effect, which would be significant under the EIA Regulations. However, given that the soil stripping works will be done under a watching brief the significance of effect could be reduced to **neutral** assuming either the absence of archaeological features or preservation by record of any discovered artefacts.
- 1.8.17 The main effect of the operational phase will be a change on the setting of designated heritage features resulting from the removal of screening vegetation, views of the passing trains which would be lit at night, and changes in the ambience of the heritage asset due to higher noise levels. There are limited opportunities for replanting along the existing railway corridor through the Avon Gorge due to the lack of space within the existing railway corridor.
- 1.8.18 The removal of vegetation and the increased train passes during the operational phase may, in the worst-case scenario, resulting in a **slight adverse** significance of effect on high heritage sites in Bristol with views across the River Avon, namely The Observatory in Clifton Down Camp; Sion Hill; the Paragon 1-14 and 15; Nos. 16-19, 20 and 21 Freeland Place; Vincent Parade, Rock House and The Colonnade on Hotwell Road; and possibly one listed buildings in Bower Ashton. In the main, the effect of the DCO Scheme on the setting of listed buildings in Bristol is assessed to have a **neutral** significance of effect. These are considered to be not significant in regard to the EIA Regulations.
- 1.8.19 The Clifton Suspension Bridge crosses over the DCO Scheme and offers views along the railway to the north and south of the bridge. There are also important viewing points of the Clifton Suspension Bridge, such as from Sea Walls in The Downs Conservation Area, and from property, including listed buildings from the edge of Bristol.
- 1.8.20 To the north, during the operation phase the views would be changed slightly, with very minor modifications to the railway alignment, a new communications mast, signals, and the loss of some vegetation principally along the line of new fencing on both sides of the railway. The communications mast and signals will form new, but slight structures within the Gorge and are not expected to be visually prominent in the context of an existing railway within the panoramic views of the gorge. It is assumed for the purposes of this assessment that the colour of the fencing will be selected to tone in with the backdrop of the woods and the gorge. The view of the fencing will soften over time due to natural revegetation.
- 1.8.21 To the south of the Clifton Suspension Bridge, the view along the railway would be much as at present, with some loss of vegetation to accommodate the new fencing and possibly

- views of the new permanent maintenance compound off Clanage Road, which will be screened with new planting.
- 1.8.22 At ground level, the DCO Scheme would not affect the setting of the Clifton Suspension Bridge. All of the above changes to the setting of and views from the Clifton Suspension Bridge are within the context of small scale changes to an existing railway within the panoramic views of the bridge and the Avon Gorge. The magnitude of the impact is assessed to be negligible change from existing conditions on this high value asset. Overall, the impact of the DCO Scheme during the operations phase is considered to have a **neutral** significance of effect based on the information currently available for the assessment.
- 1.8.23 The operational phase of the DCO Scheme is expected to result in a **neutral** effect on conservation areas and Leigh Court and Ashton Court Registered Parks and Gardens.
- 1.8.24 Adverse effects arising from direct impacts on archaeological features during construction can be mitigated through preservation by record resulting in a **neutral** effect which would not be significant in regards to the EIA Regulations. Further consideration on the impact of loss of screening vegetation on high value heritage assets in Bristol and the scope for new planting will be undertaken once the design for the rail pathway has been completed. The overall effect of the DCO Scheme on cultural heritage during construction and operation is assessed as not significant in regards to the EIA Regulations.

## 1.9 Ecology and Biodiversity

- 1.9.1 The importance of the study area for nature conservation is evidenced by the European, nationally and locally designated sites, the presence of species of flora and fauna protected by European and national legislation, and areas of ancient woodland.
- 1.9.2 The Severn Estuary is designated as a SAC, SPA, Ramsar site and a Site of Special Scientific interest ("SSSI"). The designated areas lie along the North Somerset coast within 1 km north of the DCO Scheme in the vicinity of Portishead and Sheepway and comes within 80 m of the DCO Scheme in the vicinity of Pill. Of particular relevance to the DCO Scheme are the large populations of over-wintering wildfowl and waders, including protected species, which feed and roost on the foreshore along the Severn estuary and the River Avon. Although during wintering bird surveys near Pill in 2014/2015 only two qualifying bird species for the SPA designation were observed in very low numbers.
- 1.9.3 There are two European sites within 30 km of the DCO Scheme which have bats as a qualifying feature. The North Somerset and Mendip Bats SAC lies about 8 km to the south and the Bath and Bradford on Avon Bats SAC about 24 km to the east near Bath.
- 1.9.4 The Avon Gorge Woodlands SAC is designated for its forests, screes, ravines and semi-natural dry grasslands and scrubland species on calcareous substrate. The Avon Woods SSSI is co-incident in area with the SAC designation and includes the Leigh Woods National Nature Reserve ("NNR"), both of which are designated nationally for their nature conservation interest. Leigh Wood is also listed on Natural England's ancient woodland inventory. The Avon Woods SSSI exhibits natural cliffs and quarry exposures of Carboniferous limestone, which are of great geological interest and, together with the scree, scrub, pockets of grassland and adjacent woodland, support an exceptional number of nationally rare and scarce plant species. The SSSI citation notes that the woods and gorge have an exceptional diversity of Whitebeams including two which are unique to the Avon Gorge.
- 1.9.5 There are three other SSSIs designated for their nature conservation value within 2 km of the DCO Scheme, Weston Big Wood SSSI (1.2 km at the nearest point), Horseshoe Bend at



- Shirehampton SSSI (0.65 km) on the right hand bank of the River Avon, and Ashton Court SSSI (70 m).
- 1.9.6 There are a number of non-designated local wildlife sites within 500 m of the DCO Scheme, eight of which adjoin the railway corridor. The Portbury Wharf Nature Reserve Wildlife Site lies on the eastern side of Portishead, between the railway corridor and the Severn Estuary SPA, SAC, Ramsar site, and SSSI.
  - 1.9.7 A variety of protected species of fauna are known to occupy the habitats along and adjoining the railway corridor. There are records of amphibians, including great crested newts, smooth newt, common frog and common toad. Reptiles are widespread, including grass snake and slow worm, as well as invertebrates. The mammals badger, otter, water vole, and various species of bat are present. Dormice are recorded in the ancient woodlands in the Avon Gorge. Nesting birds are found throughout the area including Barn owl and Peregrine falcon which are Schedule 1 species under the Wildlife and Countryside Act 1981.
  - 1.9.8 The invasive plant species Japanese knotweed has been found in isolated patches along the railway corridor. The biodiversity of the Avon Gorge Woodlands are also affected by invasive plant species such as Holm oak, Turkey oak, Rhododendron, Buddleia, Cherry laurel, and Sweet Chestnut.
  - 1.9.9 A number of measures are being included as part of the project design in order to minimise certain environmental effects. These include careful designing of the project to ensure key receptors are avoided where possible; construction adopting best practices techniques, which will be set out in Code of Construction Practice ("CoCP") - this document is still being finalised and will be submitted with the DCO application; and compliance with regulatory and legislative regimes as required by law.
  - 1.9.10 The final ES will fully set out and detail those embedded mitigation measures together with other measures. For the purposes of the PEI Report, the assessments have been undertaken on the unmitigated design, without taking into account measures that are expected to be included within the CoCP or mitigation licences.
  - 1.9.11 The construction works will not directly impact on the Severn Estuary SAC, SPA, Ramsar and SSSI designated sites. The Severn Estuary lies about 1 km from the DCO Scheme in the vicinity of Portishead and is separated from it by the Portbury Wharf Nature Reserve. A small area of the Nature Reserve is required for the DCO Scheme. Land-take and construction disturbance could displace birds northwards towards the Severn Estuary. However, a relatively small number of SPA/Ramsar designated birds use the Nature Reserve and given the small amount of potential habitat suitable for SPA/Ramsar species lost by the construction of the DCO Scheme coupled with the distance between the proposed works and the Severn Estuary, no effects are expected.
  - 1.9.12 There is a risk of indirect construction impacts on overwintering birds and waterfowl using the Severn Estuary SPA, Ramsar and SSSI designated sites in the vicinity of Pill. The closest construction works will be at Jenny's Meadow approximately 30 m from the designated site. It is considered that the proposed DCO Scheme would not have a significant effect on the Severn Estuary bird population due the very low numbers of designated species of birds using the intertidal section of the River Avon, the large extent of the designated site and other sources of disturbance in the area such as dog walkers and noise from traffic on the M5 Avon bridge.
  - 1.9.13 The DCO Scheme will result in the clearance of woodland and vegetation within the Avon Gorge Woodlands SAC / Avon Gorge SSSI / Leigh Woods NNR for the new security fencing, re-aligned railway, signals and communications mast. Unmitigated this could result in the loss or damage to rare and important plants, wind throw of trees following removal of the

- front stand of trees, the proliferation and spread of invasive species and pathogens (such as ash die back), the promotion of unfavourable species which can out compete the rarer slower growing species, and loss of habitat for protected species of fauna. Unmitigated this is assessed to result in a **long term major adverse** effect.
- 1.9.14 No effects have been identified for the North Somerset and Mendips Bats SAC, Bath and Bradford on Avon Bats SAC, Horseshoe Bend Shirehampton SSSI, Ashton Court SSSI and Clifton Down Wood Ancient Woodland.
- 1.9.15 Construction of the DCO Scheme is considered to lead to a **long term moderate adverse** effect on the Portbury Wharf Nature Reserve, due to the temporary land-take for construction, permanent land-take for a maintenance yard, and indirect effects of disturbance from the trains.
- 1.9.16 The DCO Scheme requires about 6450 m<sup>2</sup> of improved grassland habitat from Bower Ashton playing fields BWNS for a temporary construction site and a smaller area for a permanent maintenance compound. This is assessed to have a **long-term moderate adverse effect** on the site.
- 1.9.17 Construction activities such as the removal of vegetation to install security fencing along the railway boundary, construction dust and general construction disturbance could lead to **temporary slight to moderate adverse effects** for a number of non-statutory designated sites adjoining the railway corridor without mitigation.
- 1.9.18 The proposed works will result in the removal of a linear corridor of trees and scrub along the disused section of the railway between Portishead and Pill to facilitate the construction and operational widths of the DCO Scheme. This corridor is functionally important providing forage and dispersal habitat for a number of species, including barn owls, bats, dormice, badgers, amphibians and reptiles. Unmitigated, the significance of the effect is likely to be **long term moderate adverse**.
- 1.9.19 The proposed works will lead to the loss of trees and shrubs along the railway corridor between Pill and Ashton Junction, including through the Avon Gorge Woodlands, to accommodate the new fencing, new pathway and other features. The extent of clearance is **not known** at present and will be reviewed once the scheme design has been completed.
- 1.9.20 The construction of the DCO Scheme will result in the temporary reduction and degradation of a number of areas of grassland, including the dry grasslands of the Avon Gorge Woodlands SAC. Maintenance works to tunnel portals, bridges and retaining walls could affect important grass, herbaceous and tree species growing on these structures. Unmitigated, this could lead to **long term moderate adverse effects** on these features.
- 1.9.21 There is a risk of increased sedimentation and pollution incidents affecting watercourses which cross construction sites.
- 1.9.22 While the construction of the DCO Scheme between Portishead and Pill will not affect ponds supporting great crested newts, there will be a loss of terrestrial foraging and hibernation habitat along the railway corridor. The impact on great crested newts at five waterbodies is anticipated to be **high** due to destruction / alteration to *core* terrestrial habitat within 50 m of breeding waterbodies. The impact for two waterbodies is assumed to be **medium** due to destruction / alteration to *intermediate* terrestrial habitat within 50-250 m of breeding waterbodies. The impact at one waterbody is assumed to be **low** due to destruction / alteration to *distant* terrestrial habitat more than 500 m from breeding waterbodies.
- 1.9.23 The loss of vegetation, including the removal of trees, and increased permeability of light between Portishead and Pill may affect commuting and foraging activity by various bat

- species along this regionally important corridor. In the Avon Gorge, remedial work to Clifton Tunnel No. 2 which is an important roost site that is occupied throughout most of the year by low numbers of bats may displace bats during the works. Unmitigated these activities could have the potential to kill, injure and disturb bats causing a **long term moderate adverse** effect to bats.
- 1.9.24 The proposed works will result in the direct loss of five outlier setts and disturbance to two main/annexe setts and five further outlier setts between Portishead and Pill and the direct loss of two setts and foraging habitat between Pill and Ashton Junction. Foraging and dispersal habitat will also be lost for the duration of the construction period. Disturbance to badgers may also arise from machinery, vibration and noise, together with potential injury and death of badgers. Badgers are a relatively robust and ubiquitous species and so they are likely to recolonise the area following the completion of construction. Unmitigated this will be a **short term moderate adverse** effect to badgers.
- 1.9.25 The loss of vegetation will reduce nesting and foraging opportunities for birds, including barn owl, a Schedule 1 species, which are present along the disused railway between Portishead and Pill. Unmitigated the works would have a **short term moderate adverse** effect on birds.
- 1.9.26 Construction activities such as site clearance, excavation and the construction of haul routes have the potential to kill and injure reptiles, degrade and fragment habitats and reduce opportunities for hibernation and forage. Unmitigated these effects are assessed to be **long term, moderate adverse**.
- 1.9.27 The loss of vegetation and opening up of scrub areas between Portishead and Pill will enhance the habitat for invertebrates, leading to a **slight beneficial** effect. The removal of the rough grassland to the east of the M5, which is good invertebrate habitat, would lead to a **slight adverse** effect. The changes to invertebrate habitats along the Avon Gorge are negligible, resulting in a **neutral** effect.
- 1.9.28 Otters are present to the east of the M5 in Pill and along the River Avon. Site clearance and construction will reduce vegetation cover and will lead to increased disturbance resulting in a **short to long term moderate** effect.
- 1.9.29 In the Avon Gorge Woodlands SAC, the works may also lead to the loss of individual specimens of rare Whitebeam *Sorbus* sp. trees, although the actual number of losses is still to be determined based on the revised design of the railway. Two other rare plants may be affected by construction are *Cardamine impatiens* and *Hypericum montanum* which grow through the railway ballast. The worst case assessment pre-mitigation is a **long term major adverse** effect on the loss of critically endangered and notable plant species.
- 1.9.30 Operational impacts on overwintering birds and waterfowl using the Severn Estuary SPA/Ramsar/SSSI is predicted to be **neutral** and not significant.
- 1.9.31 Operational impacts on the Avon Gorge Woodlands SAC/SSSI include maintenance clearance and removal of important and notable species growing close to the railway for the safe running of the trains. The habitat management regime required for Network Rail's operations within the Avon Gorge will be governed by safety and funding. Further consideration of the effect of operational activities in the Avon Gorge will be presented in the ES together with a woodland management plan.
- 1.9.32 There will also be a small increase in nitrogen deposition due to the diesel engines, of less than 0.3 % in the Avon Gorge Woodlands, which is considered to be **not significant**.
- 1.9.33 The operation of the DCO Scheme is not expected to affect non-statutory designated sites between Portishead and Pill, while the assessment on non-statutory designated sites adjoining the railway through the Avon Gorge is ongoing.

- 1.9.34 During the operational phase, the vegetation management required to maintain a vegetation free corridor along the railway has the potential to degrade the remaining vegetation further.
- 1.9.35 In the Avon Gorge, ongoing maintenance will require the periodical removal of trees and shrubs close to the railway line, on structures and plants on the cliff face during stone picking. The effect of these maintenance activities on habitats and flora is **unknown** and will depend on future revegetation and the maintenance regime.
- 1.9.36 The operational effects on watercourses are considered to be **neutral** and not significant.
- 1.9.37 The effect of the operation of the DCO Scheme on bats using the railway corridor between Portishead and Pill has not yet been determined and will be discussed further in the ES.
- 1.9.38 The increase in trains through tunnels in the Avon Gorge that are used by roosting bats will increase levels of disturbance caused by turbulence and diesel emissions. Whilst this is not expected to disturb crevice dwelling bats such as *Myotis* species, it is possible that lesser horseshoe bats that hang from the tunnel walls will abandon summer roosts and hibernation sites. There may also be disruption to social activity, particularly in autumn when bats are mating. There is a small risk that individual bats trapped in the tunnel could be killed, but given the levels of bat activity recorded and frequency of passing trains the magnitude is predicted to be a very minor negative impact. Furthermore, there will be no disturbance from the train service after midnight and consequently no disruption to night roosting or social behaviour within any of the tunnels. Peak social activity by bats often occurs several hours after sunset and therefore the train service does not coincide with the entire period of bat activity and night roosting.
- 1.9.39 The displacement of lesser horseshoe bats from roosts within Clifton Tunnel No. 1 is predicted to have a minor negative impact on the local population, but given the abundance of potential roost sites in the Avon Gorge Woodlands SAC/SSSI, the impacts will not affect the distribution of bats within their natural range and habitats, or have an adverse effect on the favourable conservation of the species. Intermittent disturbance due to increased numbers of trains on the railway line will have a **slight adverse effect** on social activity within the tunnels.
- 1.9.40 Badgers are likely to habituate quickly to the new habitats, although there may be a minor increase in casualties which is assessed as a **slight adverse** effect. The effect of operations on bird, reptiles, amphibians and otter is considered to be **neutral**. There may be a **slight beneficial** effect on invertebrates due to the re-establishment of rough grassland, scrub and trees along the railway corridor between Portishead and Pill but **neutral** through the Avon Gorge.
- 1.9.41 The potential impacts of the DCO Scheme will become clearer once the revised scheme design for GRIP 3 has been completed. Proposals for woodland management on Network Rail land through the Avon Gorge Woodlands SAC /SSSI will be developed in consultation with Natural England and adjoining land owners, in particular the Forestry Commission and the National Trust. The types of measures being considered include: the removal of invasive species, translocation of rare species of whitebeams, and habitat improvement.
- 1.9.42 It is anticipated that it will be necessary to apply to Natural England for licences to close badger setts and implement mitigation strategies for European protected species. The scope of these measures is currently being developed and the proposed strategies will be developed in consultation with Natural England. The measures will be presented in shadow licence applications to accompany the DCO application.
- 1.9.43 Measures to protect flora and fauna during construction are being considered and will be incorporated into the CoCP for the contractor to implement. The CoCP will be presented in the ES and submitted with the DCO application.

- 1.9.44 The overall effect of the DCO Scheme on ecology and biodiversity will be confirmed once the detailed design has been completed and the mitigation measures confirmed.

## 1.10 Ground Conditions

- 1.10.1 The geology of the area between Portishead and Pill covers the Mercia Mudstone Group for the most part overlain by Tidal Flat Deposits and with Devonian sandstone. There are deposits of artificial ground in Portishead. The higher ground of the Avon Gorge is composed of Carboniferous limestone. Coal bearing strata are found around Ashton Gate.
- 1.10.2 The Principal aquifer, may support water supply and/or river base flow at a strategic scale. The Devonian sandstones are classified as Secondary A aquifers, which may support local water supplies at a local and in some cases form an important source of base flow to rivers. The Mercia Mudstone is classified as a Secondary B aquifer which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. There are no groundwater source protection zones or groundwater abstraction licences within 0.25 km of the DCO Scheme. There are two groundwater abstractions within 1 km. There are no nitrate vulnerable zones in the area.
- 1.10.3 There are three SSSIs designated for their geological interest within 0.5 km of the DCO Scheme. The Ham Green SSSI covers a railway cutting which has exposed a geological sequence through Pleistocene and Carboniferous sediments. Quarry Steps Durdham Downs SSSI in Bristol is designated for its fossil assemblage. While the Avon Gorge SSSI is primarily designated for the ecology, the citation also mentions the natural cliffs and quarry exposures of Carboniferous limestone.
- 1.10.4 Two Regionally Important Geological and Geomorphological Site ("RIGS") have been designated within 500 m of the DCO Scheme. North Somerset District Council has designated a RIGS centred on the Ashton Estate which extends eastwards as far as the Rownham Plantation. Bristol City Council has designated part of the Avon Gorge as a RIGS. The DCO Scheme does not cross either designation.
- 1.10.5 Historic land uses and the made ground in Portishead has resulted in land contamination conditions, which has been cleaned up as brownfield sites have been redeveloped. There are two historic landfill sites near the disused railway, Priory Farm landfill which lies between the disused railway and A369 Portbury Hundred and another site further from the disused railway near Elm Tree Farm. In Pill, the potential car parking area may be affected by residual contamination associated with the use of the site as sidings. There are also historical landfill sites in the Ashton Vale area of Bristol.
- 1.10.6 The route of the DCO Scheme was an established railway corridor for a considerable period and as such there is potential for the underlying ground to be affected by contaminants associated with the original source of the ballast and subsequent railway use. Trackbed investigations have confirmed the existence of sections of contaminated ballast along the railway corridor.
- 1.10.7 During construction, the existing ballast along the railway disused section between Portishead and Pill is no longer suitable and will have to be lifted and replaced with new ballast. It is also likely that some of the ballast along the operational railway line will also be replaced, although the exact locations are currently being determined. Ballast removed will either be treated and reused on other schemes or disposed of in accordance with Network Rail's procedures.
- 1.10.8 Construction of the railway will have no impact on the underlying geology or hydrogeology in terms of regional and local flows or groundwater quality. There will be no impact on the railway from underlying ground conditions and the railway construction will not be sensitive to any residual contamination beneath the existing railway corridor. The



construction of the new stations and car parking areas may be sited on potentially contaminated land and any constraints relating to contamination will need to be identified and the construction designed to mitigate the risks identified. Construction itself will have no significant impact on the underlying ground.

- 1.10.9 The DCO Scheme works in the vicinity of the historical Priory Farm Landfill consists of ballast replacement and new rails, and possibly clearance of ditches. If gas and leachate are present from this landfill, they are unlikely to have a significant effect on the DCO Scheme. This matter will be investigated as part of the ongoing studies. The DCO Scheme is unlikely to affect or be affected by the Elm Tree Farm landfill which is approximately 250 m to the north.
- 1.10.10 Earthworks are required at three locations in Pill, on the west side of the Avon Road Underbridge, the cutting slope to the back of Pill Station to the rear of gardens off Hardwick Road and Sambourne Lane, and to the east side of Pill Viaduct to the rear of properties off Mount Pleasant. The earthworks will be designed to form stable slopes.
- 1.10.11 Ham Green SSSI is unlikely to be affected as the existing rail corridor is wide enough to accommodate the planned services and no excavations of the existing cutting are currently envisaged. There will be no direct impacts on the Durham Down Quarry Steps SSSI and the RIGS or any material change to the geological interest of the Avon Gorge SSSI.
- 1.10.12 Cliff instability is a known problem within the Avon Gorge. On occasions falling stones have struck the freight trains travelling along this line. Network Rail periodically undertakes “stone picking” exercises to reduce the risk of rock fall. This will continue for the DCO Scheme to maintain operational safety for the passenger trains.
- 1.10.13 The proposed works in the vicinity of the Ashton Gate Level Crossing are located within the defined coalfield and accordingly due consideration should be afforded to ground conditions and the potential for unstable land to be present. The works required in this area are relatively minor, comprising modifications to the layout of Winterstoke Road and a new pedestrian and cycle ramp from Ashton Vale Road to Ashton Road.
- 1.10.14 During the operational phase, there will be no material changes in the underlying soils and geology. While there is a risk of contaminants from the trains discharging onto the track (hydrocarbons and wastewater), any effects on the underlying geology from pollutants entering the ground would be managed through standard maintenance practices of the trains themselves. This would be the case for all railways. No impacts during operations phase are expected.
- 1.10.15 The overall effect of the DCO Scheme on ground conditions during construction and operation is assessed as **not significant**.

## 1.11 Landscape and Visual Impact

- 1.11.1 The topography in North Somerset and Bristol covers the low-lying coastal plain backed by alternating ridges and broad river valleys. Portishead itself is built on an area of higher land, which rises to about 100 m above ordnance datum (“AOD”), surrounded by the coastal plains at less than 10 mAOD elevation. A broad ridge of higher land extends from Clevedon, along Tickenham Ridge and through Failand and continues across the River Avon through Clifton and the northern suburbs of Bristol towards the Cotswolds. The River Avon has cut a valley through this ridge of high land, creating the Avon Gorge.
- 1.11.2 The railway corridor crosses two natural character areas defined by Natural England, the Severn and Avon Vales Natural Area and Bristol, Avon Valleys and Ridges Natural Area. The Severn and Avon Vales Natural Area is characterised by undulating low-lying land, where the river floodplains regularly flood in winter, including seasonally flooded washlands. The Bristol, Avon Valleys and Ridges Natural Area is a complex and variable landscape,

- characterised by alternating ridges and broad valleys with some steep wooded slopes and open rolling farmland. The large urban expanse of Bristol and the limestone Avon Gorge dominate the central part.
- 1.11.3 The urban land uses in the area include residential, commercial and industrial uses in Portishead, Pill and the outskirts of Bristol. The Royal Portbury Dock is a large scale utility landscape characterised by extensive areas of hard surfacing and lighting for the storage of imported goods. There are extensive areas of countryside, characterised by grazing pasture with fields bounded by hedgerows and patches of woodland.
  - 1.11.4 Much of the countryside lies in the designated green belt, an important planning designation to protect the countryside from inappropriate development. There are no national or local landscape designations.
  - 1.11.5 The urban character of Pill with the elevated viaduct and cuttings and the locally complex landform at Ham Green, where the line passes into tunnel, result in complex views in and out from the railway line. There are longer views over the fields towards Ham Green and Shirehampton.
  - 1.11.6 Views are constrained within the Avon Gorge. Views down into the gorge are possible only at specific locations such as the Clifton Suspension Bridge and from certain locations on the edge of the gorge, for example from the Circular Road on The Downs in Bristol, as elsewhere, such as in Leigh Woods, views are constrained by the wooded slopes.
  - 1.11.7 As the gorge opens out towards Bristol, there are longer views out to Ashton Court Estate to the west and the housing in Clifton on the higher ground above Hotwells to the north east. Open views in the industrial and commercial areas of Ashton Gate are constrained by larger buildings and highway infrastructure such as the Winterstoke Road / Brunel Way junction. The dense urban nature at Ashton Vale with its larger scale retail and commercial buildings screen views to the railway line from the surroundings. Glimpsed views are possible between buildings down roads and across car parking areas.
  - 1.11.8 The disused railway line between Portishead and Pill and the freight line from Royal Portbury Docks to the southwest mainline are existing features in the landscape, and are not new elements being introduced. Their appearance and prominence in the existing landscape varies.
  - 1.11.9 At Portishead east of the town centre, there is a clear gap between the residential developments to the north and south of the disused line. The undeveloped land closer to the town centre is the former station approach. Between Portishead and Pill, views to and from the DCO Scheme are restricted due to the low lying topography, hedge boundaries around many of the fields, and the tree and shrubs that have grown up along the railway corridor. Recent vegetation clearance within the railway corridor to allow surveys and geotechnical investigations has opened up views locally of the railway. Longer views along the railway corridor are possible from the road crossings and the M5.
  - 1.11.10 The freight line is operational with the occasional freight trains. The railway line is a feature of Pill, enclosed in a cutting at the station but in an open position on the viaduct, before passing under Ham Green in a tunnel. East of Ham Green the line is in cutting and screened by trackside trees, before entering the Avon Gorge. Here it fits along a narrow ledge at the base of the gorge with three tunnels. The track is visible from above as a line or break in the woodland and other vegetation. It passes under the Clifton Suspension Bridge before entering the urban area of Ashton Vale where it becomes screened by buildings and highway infrastructure.
  - 1.11.11 The most likely effects on landscape and views will occur during construction. At Portishead the effects would be screened from the wider landscape by the buildings, but be more immediate to those people who live around the area. In the open area of



Sheepway, the construction compound and the movement of construction traffic on the haul roads would be visible in the wider landscape. The buildings and highway infrastructure by the docks and M5 would also screen the construction activity from the wider landscape.

- 1.11.12 Trees and planting would be lost, both as a safety requirement but also during construction to create working space to rebuild the track, for ditches and to install new fencing.
- 1.11.13 Replacement planting will be proposed along the disused line but the restrictions on the species which could be used adjacent to an operational railway would mean that it would not be possible to plant large scale or tall trees. The existing network of field hedgerows and trees will continue to screen the railway.
- 1.11.14 In the Avon Gorge, the loss of vegetation along the railway, in particular between the track and the River Avon Tow Path, and the loss of some vegetation on the cliff face would result in the loss of screening and construction activity being more intrusive in the landscape.
- 1.11.15 The fencing would become a more dominant feature when close to the railway, such as in the urban areas, by the National Cycle Network and along the River Avon Tow Path. The type of fencing is determined by the risk of likely access to the track, and would generally be higher and visually denser than current fencing.
- 1.11.16 Construction activities such as the movement of machinery and lorries, night-time working between Pill and Ashton Junction with the associated temporary lighting, and construction activities at the construction compounds, especially the rural compounds at The Portbury Hundred, Lodway Farm and Clanage Road, will all temporarily affect the landscape character.
- 1.11.17 In general, the significance of the effect of construction activities on the national and local landscape character areas is assessed to be **slight adverse**, but reaching **moderate adverse** for the Avon Gorge local character area given the high value of this area, the greater impact of night-time working along this normally dark section of the Avon Gorge, and the removal of vegetation, especially between the railway and the River Avon Tow Path and possibly on the cliff faces due to stone-picking.
- 1.11.18 In site specific character areas, the construction works could have a **moderate adverse** effect on the immediate surrounds in Portishead, Sheepway, Pill, and the Avon Gorge and a **slight adverse** effect elsewhere.
- 1.11.19 There would be views of the construction works from the periphery of six conservation areas, resulting in a **slight adverse** effect in relation to the edge of the conservation areas. The proposed Clanage Road construction compound and permanent access lies within the Bower Ashton Conservation Area. There are some views from the proposed site over the high boundary wall towards the parkland slopes to the west of Ashton Court House, although there are no views to the house. The effect of the construction works on this conservation area is assessed as **minor adverse**. Leigh Woods Conservation Area does not have views of the DCO Scheme so would be unaffected.
- 1.11.20 The effect of construction works on listed buildings between Portishead and Pill is generally **neutral** due to the lack of visibility. The exception is Court House Farm where there would be views across Marsh Lane towards the proposed haul road towards the M5. The significance of effect for this property is **slight adverse**. In Pill the significance of effect of distant views of the works to Pill Viaduct is assessed as **slight adverse** for The Watchhouse and Mulberry Cottage.
- 1.11.21 The loss of screen planting along the railway and views of construction activity over a short period could result in a **slight adverse** significance of effect for high value listed buildings in Clifton, including the Clifton Suspension Bridge, Clifton Observatory, the Swing

- Bridge over Lock, Brunel's South Entrance Lock, Swing Bridge over Brunel's South Entrance Lock, The Colonnade, No. 15 The Paragon, No. 1-14 The Paragon, and Freeland Court.
- 1.11.22 The construction activities are assessed to result in no overall change and a **neutral** significance of effect for Leigh Court and Ashton Court Registered Parks and Gardens.
- 1.11.23 Partial views from the southern section of the Roman Settlement of *Abonae* Scheduled Monument towards the construction activity and vegetation removal around Miles Dock underbridge is assessed as **slight adverse**. However, there will be no change and a **neutral** effect on the setting of Clifton Down Camp Scheduled Monument and the DCO Scheme will not affect the setting of Stokeleigh Camp Scheduled Monument.
- 1.11.24 Once the passenger service is operational, there would be more movement in the landscape with the passing trains. The impacts of this will vary. At Portishead it would increase the sense of urbanisation with the new station building and car park. Between Portishead and Pill, the DCO Scheme will result in the introduction of moving trains to an existing linear feature of the landscape which historically was a railway line. The railway itself is difficult to see in the open landscape, appearing as a line of trackside vegetation amongst other field boundaries. The trains would be a new moving element at Sheepway, reducing the sense of remoteness and tranquillity associated with this landscape, but lost in the busyness of the M5 and lorry movements at the Docks. The cutting at Pill and tunnel at Ham Green would offer limited views to the moving trains from a wider landscape, but would be in closer proximity to people at Pill. There would be an increase in movement through the Avon Gorge; freight trains are currently low in number, but the A4 Portway on the opposite bank is a busy road.
- 1.11.25 The movement of passenger trains through the landscape when dark during winter mornings and evening would introduce a new element of lighting into the landscape. These would be most visible in the relatively dark landscape at Sheepway and through the Avon Gorge.
- 1.11.26 The loss of planting adjacent to the track during construction would result in more open views to the track and the passing trains during operation. The ongoing vegetation management will maintain the trackway clear of vegetation.
- 1.11.27 The DCO Scheme only crosses through a small part of the national character areas and is assessed to have a **neutral** effect on them. The DCO Scheme is also assessed to have a **neutral** effect on most of the local authority landscape character areas, as the railway corridor already exists, it crosses a small proportion of the local authority landscape character areas, and other elements in the landscape such as the Royal Portbury Dock or the M5 dilute the sense of tranquillity in the area. The loss of planting adjacent to the railway through the Avon Gorge would result in more open views to the track and the passing trains. Pending completion of the proposed woodland management plan for the vegetation in the Avon Gorge Woodlands SAC, it is assumed that there will be some occasional removal of selected trees which may result in more open views towards the railway and a less wooded appearance to the slopes. Overall the DCO Scheme is assessed to have a **slight adverse** significance of effect on the Avon Gorge local authority character area.
- 1.11.28 The DCO Scheme is assessed to have a **moderate adverse** significance of effect on the site specific landscape through Pill. The DCO Scheme will not change the overall landscape character in Pill, given the existing operational railway and occasional freight trains. The re-introduction of passenger trains and the rebuilt station at Pill would add new elements to the landscape, however, these would fit with the existing townscape features. The new bridge and embankment at Avon Road would be more exposed in the landscape due to the loss of the existing vegetation. The rebuilt platform and its ramp and step access are mostly set within the existing cutting and their influence on the surrounding areas is

limited. The location of the station forecourt and station car park, which may also house the principal power supply point for signalling equipment, would introduce a transport related feature into an otherwise mostly residential area.

- 1.11.29 In Portishead, the DCO Scheme is assessed to have a **slight beneficial** significance of effect on the commercial landscape around the new station due to the conversion of derelict land to the main car park and replacement planting associated with the station forecourt and car parking areas which would help to screen and enhance the landscape.
- 1.11.30 Elsewhere, the DCO Scheme is assessed to have a **slight adverse** or **neutral** significance of effect on site specific landscapes.
- In residential Portishead, around Sheepway and near the Royal Portbury Dock changes in the landscape will occur due to the conversion of the overgrown disused railway corridor to an operational railway with passing trains and new permanent features such as the footbridge at Trinity Primary School and the permanent access point off Sheepway.
  - The DCO Scheme would not change the landscape character in Ham Lakes and is hidden from view in Pill Tunnel.
  - In Sea Mills, while the DCO Scheme will introduce new passenger trains this will be on an operational, railway largely through cutting.
  - As the linear feature of the freight line is already an element through the Avon Gorge, the DCO Scheme would not result in a change in overall landscape character. The introduction of passenger trains would add a new moving element to the landscape, which would dilute the sense of tranquillity slightly, although it is already heavily influenced by the busy A4. The DCO Scheme would result in the loss of some mature vegetation, which currently screens the existing freight line from key vistas looking across the River Avon. The loss of planting between the trackside and adjacent path would mean that the track, its associated fencing and passing trains would be more visible.
  - The landscape in the Ashton Gate area includes some features of importance such as the parkland of Ashton Court. It has a complex urban character with a network of roads dividing the area. As the freight line is already an element of this area, the DCO Scheme would not result in a change in character, although the introduction of passenger trains would add a new element of movement into the landscape, however, this would sit congruously against the existing urban features.
  - Ashton Vale has an urban-fringe character, with industrial units and distributor roads dominant features. As the linear feature of the freight line is already a constituent of this area, the DCO Scheme would not result in a change in character. The introduction of passenger trains would add a new element of movement into the landscape, however, this would sit congruously within the existing urban features.
- 1.11.31 The setting of listed buildings, conservation areas, scheduled monuments and registered parks and gardens are generally unaffected as the disused line and freight line are already part of the setting to these features. Between Portishead and Pill, the significance of the effect of the DCO Scheme on listed buildings is generally assessed as **neutral** due to the lack of inter-visibility. A **slight adverse** significance of effect is predicted for The Downs Conservation Area, where the DCO Scheme would impact the setting of The Trym Valley and River Avon due to the loss of vegetation, more open views to trains and the fencing, and Bower Ashton Conservation Area due to the permanent access point and loss of vegetation along the railway.

- 1.11.32 Where likely significant effects have been identified consideration is being given to landscaping and other measures to mitigate effects. Draft schemes have been prepared and consultation will continue with statutory consultees and other parties before the schemes are finalised
- 1.11.33 At present, as work continues on the design of the DCO Scheme, the extent of vegetation removal is unknown. Once the design is confirmed the extent of vegetation removal and the impact on the landscape and views will be assessed and reported in the Environmental Statement which will be submitted with the DCO application.
- 1.11.34 The overall effect of the DCO Scheme on landscape and visual impact will be confirmed once the detailed design has been completed.

## 1.12 Materials and Waste

- 1.12.1 The use of material resources and the generation of waste during the routine maintenance activities associated with the operation of the existing Portbury Freight Line is negligible, as is any use of material resources and waste associated with the maintenance of the existing highway network. The disused section of the railway between Portishead and Pill is not in operational use so there is no existing use of materials or waste generation.
- 1.12.2 The review of natural resources shows that there is likely to be adequate reserves of sand and gravel and substantial reserves of crushed rock in the study area.
- 1.12.3 The DCO Scheme is following the existing railway alignment and is not located within an area designated by North Somerset District Council or Bristol City Council as a Minerals Safeguarding Area or Preferred Area for Minerals Working and is therefore unlikely to result in the sterilisation of existing mineral resources.
- 1.12.4 A review of waste management infrastructure in the region suggests that there is likely to be adequate waste management capacity for the majority of wastes arising from the construction of the DCO Scheme, with the possible exception of any hazardous waste streams. All wastes generated during the construction of the DCO Scheme will be disposed of in accordance with Network Rail's procedures and standard practices.
- 1.12.5 The construction of the DCO Scheme will require the use and consumption of material resources and hence will result in potential impacts on the environment through the depletion of natural resources and the embodied carbon associated with extraction, manufacturing and any pre-distribution transportation.
- 1.12.6 The construction phases of the DCO Scheme will also result in surplus materials and waste, leading to potential impacts on the available waste management infrastructure (i.e. through the permanent use of landfill void space and/or the short-term use of waste treatment capacity).
- 1.12.7 The potential for greater environmental impacts and effects is likely to arise from those materials which are used in the largest quantities or are high in embodied carbon, wastes which arise in the largest quantities, which have hazardous properties or cover a large proportion of the value of the DCO Scheme.
- 1.12.8 Where impacts are identified in the course of more detailed design, these will be addressed through ensuring that the construction of the DCO Scheme responds to national regulatory standards and local policy advice.
- 1.12.9 The environmental impact from the embodied carbon emissions associated with the construction of the DCO Scheme has been qualitatively assessed as having a likely, long-term, permanent, indirect, adverse, cumulative effect on the global climate system. This is a result of the DCO Scheme generating new emissions as a result of the consumption and use of construction materials and products.

- 1.12.10 The environmental impact of the use of primary aggregates during the construction of the DCO Scheme has been assessed at this stage as having a likely, **short-term, permanent, direct, slight adverse, cumulative** effect on the regional natural resources.
- 1.12.11 The environmental impact of waste from the construction of the DCO Scheme has been assessed at this stage as having a likely, **short-term, temporary, direct, slight adverse, cumulative** effect on the available regional waste infrastructure.

## 1.13 Noise and Vibration

- 1.13.1 The existing ambient noise levels vary across the study area, generally with higher noise levels in urban areas compared with rural areas. Daytime noise levels are typically 50-55 dB(A) in suburban areas and 45-50 dB(A) in rural areas. Noise levels also tend to be lower at night than during the day. At any one location, the noise climate is made up of various noise sources, such as traffic along the distant M5 and on local roads, bird song, aircraft, and activities at schools, recreational grounds and commercial and industrial locations.
- 1.13.2 In Portishead, measured daytime noise levels are typically 45 to 55 dB(A) falling to 38 to 48 dB(A) at night. Around Sheepway, the day-time noise levels were similar varying between 50 and 55 dB(A) and falling by about 4 dB(A) at night, reflecting the effect of traffic noise from the M5 as well as other noise sources including local traffic, bird song, and the occasional aircraft despite the rural location.
- 1.13.3 In Pill daytime noise levels are typically around 50 dB(A), with the noise climate comprised of distant motorway noise, local traffic, infrequent freight trains, and bird song. In more rural locations, such as Chapel Pill Lane, the day time noise levels were lower between 40 to 48 dB(A). The difference between day and night time noise levels is typically 3 to 7 dB(A).
- 1.13.4 Daytime noise levels in the Avon Gorge are relatively high for a rural location at about 59 dB(A). This reflects the proximity of the heavily trafficked A4 Portway on the east side of the river and the reflection of noise off the cliffs in the gorge. In the Ashton Gate area noise levels are consistently about 50 dB(A) during the daytime and about 45 dB(A) at night. The noise climate is comprised of local traffic, although passing freight trains are clearly audible in the vicinity of the railway.
- 1.13.5 During the construction phase, some construction activities would produce noise levels above 75 dB(A), with some being close to 85 dB(A). Given the baseline day time noise level at most locations is around 50 dB(A), the increase in noise at the closest receptors to the works for most activities would be between 15 and 20 dB(A). This would be a temporary significant effect. Consideration is being given to developing mitigation measures to reduce this impact.
- 1.13.6 During the operation phase, the hourly service will introduce a new noise source along the railway itself and in and around the stations at Portishead and Pill due to the idling of the diesel engines while the trains are in the station, public announcement systems, traffic to and from the car parks, and general activity of people.
- 1.13.7 Noise levels were forecast for the DCO Scheme for the short term (year of opening) and the long term (15 years after opening). Both scenarios allow for the increase in road traffic as predicted by the traffic model, while the short term assessment assumes a three-carriage train while the long term assessment assumes a five-carriage train.
- 1.13.8 The assessment shows that the highest noise levels occur for those properties closest to the stations and the railway line. Noise levels at properties one row back from the railway are forecast to be notably lower due to the shielding effect of those houses fronting the railway line. Variations in topography also account for some variation in forecast noise levels, with higher noise levels at property near sections of the railway on embankment,

- but lower noise levels where the railway is in cutting. In general, the increase in noise levels is classed as negligible to minor adverse both for the short term and the long term assessments.
- 1.13.9 The highest noise levels were forecast for property off Pear Tree Field on the south side of the proposed station Portishead, with an increase in ambient noise levels of more than 5 dB(A) in the short term. This increase is a significant major adverse impact, mainly caused by the noise from the trains when idle at Portishead Station. With a 2 m high noise barrier from the end of the station to the start of The Vale Park, the noise increase would be reduced to just under 1 dB(A), which is a negligible impact. For both the short and long term assessments, the significance of the effect of the DCO Scheme on noise levels with mitigation at this location is assessed to be **slight adverse**.
- 1.13.10 On the eastern side of Portishead, the short term increase in noise levels from the trains approaching the station was estimated to reach 2.3 dB(A) for properties off Tydeman Road and just under 2 dB(A) in the short term along Fennel Road and Tarragon Plan. Elsewhere in Portishead the increase in ambient noise levels was assessed to be mostly less than 1 dB(A) in the short term. These increases in noise level are minor and are assessed to be a **slight adverse** effect.
- 1.13.11 Between Portishead and Pill, the increase in noise levels was predicted for just over 3 dB(A) in the short term for the Old Station House off Sheepway. A 2 m high noise barrier would reduce the noise level to below 1 dB(A), a **slight adverse** effect. The increase in ambient noise level is predicted to be about 1.5 dB(A) in the short term for buildings on the southern edge of Elm Tree Park and falling to less than 1 dB(A) for other property. For other property in Sheepway and Portbury, the increases in noise levels for residential property are forecast to be below 1 dB(A) and slight adverse effect. For the mitigated scheme, the short and long term increases in noise levels is assessed to be **slight adverse**.
- 1.13.12 On the west side of Pill, the increase in ambient noise levels in the short term is estimated to be just under 2 dB(A) for property on the north side of the railway in Avon Road and Severn Road and to the south of the railway in Lodway Close and the western end of Hardwick Road. Increases in noise level are forecast to be about 1.5 dB(A) for property off Sambourne Lane and just over 1 dB(A) off Monmouth Road. The short term noise increase is predicted to be less than 1 dB(A) for property off Chapel Row, New Road and Star Lane due to the effect of topography and the screening effect of existing walls alongside the railway. Between Pill Viaduct and Pill Tunnel, where the railway is on embankment the short term noise increase is forecast to be about 2.5 dB(A). Further from the railway line the increase in noise is below 1 dB(A) due to the distance from the noise source and screening provided by other houses.
- 1.13.13 The forecast changes in the Avon Gorge are minor. On the east side of Pill Tunnel, noise levels at property along Chapel Pill Lane are forecast to increase by less than 1 dB(A) for the short term. Through the Avon Gorge, there are no residential receptors on the west side and the outskirts of Bristol on the east side. Assessments for three locations in Leigh Woods Conservation Area on the west side of the gorge indicate no increase in noise levels with the DCO Scheme. The village of Leigh Woods is located on the upper slopes of the gorge and is shielded by railway noise by topography. On the eastern side of the Avon Gorge, the highest increase in noise levels is forecast to be 0.5 dB(A) in Shirehampton, which is a **slight adverse** effect.
- 1.13.14 At the closest sensitive receptors to the railway line in the area around the Brunel Way, the highest day time increase in noise is predicted to be 0.5 dB(A) in the short term.
- 1.13.15 The predicted overall noise levels at locations where the noise level change is predicted to change by more than 1 dB(A) are not above the trigger level of 68 dB  $L_{Aeq,18h}$ . Part 2 of the Noise Insulation (Railway) Regulations would not be triggered.



- 1.13.16 Freight trains generate a higher level of vibration than passenger trains. The vibration levels monitored close to the railway in Pill for freight trains are below the threshold at which the risk of building damage is considered to be negligible but are just above the level perceptible in residential properties. The addition of a passenger train service is not considered to be significant.
- 1.13.17 The increase in ambient noise levels during construction will be addressed through the adoption of a noise control plan. Further details will be provided in the CoCP and presented in the Environmental Statement. The DCO Scheme is forecast to result in moderate adverse noise increases at two locations, along the south side of the railway between Portishead station and Trinity School footbridge and by the Old Station House in Sheepway. Mitigation has been proposed at both locations.
- 1.13.18 No further mitigation has been identified at this stage of project design and the residual effects remain as described above. The residual effects are not significant in terms of the EIA Regulations.

## 1.14 Socio-economics and Regeneration

- 1.14.1 The socio-economic profiles of Portishead, Pill and the wider West of England region point to a relatively prosperous, open economy with people travelling from Portishead and Pill to work elsewhere within the region.
- 1.14.2 There are a number of vulnerable or disadvantaged groups in the study area. These include: disabled, ethnic minorities, young people and elderly, and low income groups. these groups tend to form a smaller than average proportion of the local population in the study area compared with national averages. The exception is Pill, which is home to an above average proportion of elderly and disabled residents.
- 1.14.3 There are high levels of car ownership in the West of England with around eight out of ten households owning a private car or van. A very high rate of car ownership is also reported in Portishead and Pill, with nearly nine out of ten households owning a private car or van. This suggests an over-reliance on private car ownership, which could be reduced through the provision of an improved public transport network, leading to socio-economic, health, equality and environmental benefits.
- 1.14.4 The West of England is a relatively self-contained travel to work area, with 90% of residents also working within the sub-region. Further, two-thirds of all residents who both live and work in the West of England travel to work using motor vehicles. This suggests a high reliance on private car ownership despite a high rate of containment within the sub-region. This points towards a lack of attractive alternative transport modes for commuting trips.
- 1.14.5 Trends for skills and qualifications, social grading, wages and occupational structure are more mixed. The general trend for Portishead, Pill and the West of England as a whole are positive, resulting in high levels of employment in high-value industries (including financial and business services) where residents are employed in higher end occupations (including senior and managerial professions). This is reflected in the absence of considerable levels of aggregate deprivation in the towns and across the wider context area in general.
- 1.14.6 During construction, the Portishead Branch Line is expected to result in a **moderate positive** socio-economic effect, through the creation employment in the construction sector, uplift and indirect benefits through increased economic activity in the construction supply chain.
- 1.14.7 During the operation phase, the Portishead Branch Line is expected to result in largely positive socio-economic effects through employment generation, transport benefits of reduced journey times and congestion, wider regeneration benefits throughout



- Portishead, Pill and the west of England as a whole, enhance the socio-economic situation conditions, contribute to planning policy, enable development, and increase accessibility and connectivity. The assessment of the socio-economic effects is based on the preliminary business case and covers all the improvements in services for MetroWest Phase 1, including the Portishead Branch Line. At this stage it is not possible to assess the effects of the Portishead Branch Line in isolation, although this will be done for the Environmental Statement.
- 1.14.8 Employment creation could be realised through the provision of services at the stations such as ticketing, small scale retail, cleaning, and maintenance activities as well as additional train drivers. This is assessed to be a **minor beneficial** effect.
  - 1.14.9 Once implemented, the MetroWest Phase 1 service has the potential to reduce journey times and congestion across the West of England's transport network through a shift from highway to public transport systems, and will likely benefit commuters, businesses and leisure/recreation and retail consumers. The effect of reduced journey times and congestion could include widened labour supply and demand catchments leading to higher labour participation and employment rates, improved productivity boosting local economic output and increased business attraction to the local and wider study areas, leading to increased investment and further job creation. This is considered to be a **major beneficial** significant effect.
  - 1.14.10 In terms of affordability, the MetroWest Phase 1 Preliminary Business Case suggests that the likely fare structure adopted for the DCO Scheme will have a net **minor beneficial** impact for residents. This is because although rail fares are typically higher than bus fares, rail trips tend to be quicker. When journey time savings and other 'real' value of time savings (e.g. subsequent reduced child care costs) are considered, the fare structure for rail trips is considered reasonable.
  - 1.14.11 The DCO Scheme could lead to wider regeneration throughout Portishead, Pill and the West of England as a whole, via a range of potential routes. Taken together, the scheme could have far-reaching implications for the socio-economic profile of the immediate and wider study area. For example, the generally positive socio-economic trends for residents in Portishead, Pill and the West of England imply that residents are likely to be employed across a wide catchment area and would therefore benefit from the introduction of new transport networks to options for commuting across the wider region. Further, where pockets of deprivation do exist, residents may benefit from increased accessibility to wider job markets, education facilities and other services offered by MetroWest Phase 1.
  - 1.14.12 The scheme could transform the study area's socioeconomic profile, by on the one hand providing a viable alternative mode of transport to private car use for commuters, but on the other hand, providing incentives for investment and business relocation to Portishead and Pill to support self-containment of the economy. This could assist residents in the study area to secure local employment that is commensurate to their relatively high levels of skills, qualifications and social grading, as well as providing an opportunity to rebalance the residential and workforce sectoral profile of employment.
  - 1.14.13 Delivering the DCO Scheme will assist the West of England in realising some of the strategic economic objectives outlined in local and national planning policy documents. The provision and operation of MetroWest Phase 1, is explicitly recommended within the local planning documents and is therefore strategically aligned to assisting the drive towards achieving local economic aspirations. By aligning with the local and national planning framework, the DCO Scheme will help policy objectives to be realised, leading to a range of impacts on socio-economic receptors including local residents, firms and the sub-region's labour market. The effect of achieving the policy objectives will include

economic growth and development in line with the targets set out in the Core Strategies of North Somerset District Council and Bristol City Council.

- 1.14.14 As well as the general, qualitative linkages between transport infrastructure and economic performance that the DCO Scheme could facilitate, the DCO Scheme's operations could help unlock or accelerate specific development projects in the sub-region. By improving transport links to development parcels and generally enhancing public transport provision, MetroWest Phase 1 could impact on a range of receptors, including land owners, developers, businesses, labour markets and consumer markets. The subsequent effects of enabling development for these receptors are many and varied. For example, land values and development viability could increase for land owners and developers due to enhanced transport linkages. Numerous station and rail investment programmes have resulted in regeneration, as measured by land value uplift and unlocked development land. Similarly, these transport linkages could make labour supply and labour demand markets more interconnected, thus reducing unemployment, increasing economic activity and increasing the pool of skilled labour within a firm's catchment area. Firms may also benefit from widened consumer markets which could prompt an expansion of the business base.
- 1.14.15 MetroWest Phase 1 will lead to improved connectivity between Portishead, Pill and the rest of the West of England. Increased accessibility across the sub-region is a key potential impact for the DCO Scheme, and will be characterised by improved connectivity, reduced journey times and congestion. This could influence developers, businesses, labour markets and investors and lead to benefits such as reduced severance in Pill, Portishead and disadvantaged communities along the MetroWest Phase 1 route (such as Lawrence Hill), modal shift and increased inward investment and business attractiveness to the sub-region as the West of England's image improves.
- 1.14.16 In summary, the DCO Scheme could deliver wider regeneration associated with accessibility and connectivity improvements that widen labour demand and supply catchments. These effects would benefit West of England residents and businesses respectively. Improving connectivity could also facilitate business location and expansion in the sub-region, further widening labour supply catchments and increasing the potential for retaining skilled members of the local workforce within the sub-region. These potential impacts are aligned with the aspirations of local and national planning policy.
- 1.14.17 Wider regeneration and economic growth is a key theme permeating through the planning policy literature. The desire for on-going job creation is a recurring message as well. MetroWest Phase 1 could facilitate job creation and land development in Portishead and at a number of key growth areas across the West of England. The significance of MetroWest Phase 1 to wider regeneration efforts is assessed as **major beneficial**.

## 1.15 Soils, Agriculture, Land Use and Assets

- 1.15.1 The DCO Scheme passes through the urban areas of Portishead, Pill and south west Bristol, separated by low-lying agricultural land between Portishead and Portbury, Royal Portbury Dock near Pill, and the woodlands of the Avon Gorge.
- 1.15.2 Several farm holdings are located along either side of the route between Portishead and Chapel Pill. The railway corridor crosses Grade 3 or Grade 4 agricultural land, with soils in the Newchurch and Whimple 1 associations. Ham Green Lakes are stocked with fish for sport.
- 1.15.3 There are a large number of utilities passing alongside and crossing the proposed route of the DCO Scheme, including buried services for drinking water supply, foul sewers, stormwater drains, electricity, BT cables, and gas pipelines and overhead BT and electricity cables.

- 1.15.4 There are a variety of community facilities close to the DCO Scheme. The proposed station in Portishead is located close to existing retail units, medical facilities, a playschool, Trinity Primary School and areas of outdoor space. The Portishead Ecology Park and Portbury Wharf Nature Reserve on the eastern side of Portishead are enjoyed by the local community.
- 1.15.5 In Pill, important areas of open space include Victoria Park, Waterloo Wharf, and Watchhouse Hill. In the Avon Gorge the DCO Scheme passes through Leigh Court Registered Park and Garden, under the Clifton Suspension Bridge, through Leigh Woods and alongside the River Avon Tow Path. Towards Bristol, the DCO Scheme passes Bedminster Cricket Club and Teddies play school, the eastern boundary of Ashton Court Registered Park and Garden and several allotments.
- 1.15.6 The DCO Scheme also passes three areas identified as development land, Court House Farm which is being redeveloped by the Bristol Port Company, the former Avon and Somerset Police Dog and Horse Training Centre off Clanage Road, and Alderman Moore's Allotments, part of which is designated for development.
- 1.15.7 Construction of the DCO Scheme will require the demolition of No. 7 Station Road to make a new forecourt and entrance to Pill Station and depending on the construction methodology, the demolition of a section of garden wall and 12 garages to manoeuvre a large crane into position. The property on Station Road has been acquired by North Somerset District Council. If it is decided that a large crane is required to rebuild Avon Road Bridge, the garden wall would be rebuilt and the Council will liaise with the affected parties regarding the garages. The loss of the property on Station Road and the garden wall is assessed to be a **neutral** significance of effect, while the temporary loss of the use of the garages is assessed to be a temporary **moderate adverse** significance of effect for the owner and occupiers.
- 1.15.8 Temporary access will be required from the Lodway construction compound across several gardens off Lodway Close to the Avon Road Bridge. This will result in the loss of planting and any structures along the route resulting in a **large adverse** significance of effect for a small number of householders. It will also be necessary to impose short term restrictions on access to the rear of gardens off Mount Pleasant during the embankment stabilisation works for health and safety reasons. This would be a **slight adverse** significance of effect.
- 1.15.9 Permanent land-take of the yards off Monmouth Road will be required to construct the station car park in Pill. These yards were originally created for the railway and were subsequently sold into private ownership. The loss of the whole site prior to agreement on compensation is assessed as a **moderate adverse** significance of effect.
- 1.15.10 North Somerset District Council is consulting with the affected householders in Pill regarding temporary land acquisition. If it is necessary to demolish the garages in Pill, consideration will be given to opportunities for mitigation.
- 1.15.11 Temporary and permanent land-take may be required from land that is being used by the local community on the north and south approaches to the new Trinity Primary School footbridge. The area required is very small and the effect on land used by the community is **neutral**.
- 1.15.12 Temporary and a smaller area of permanent land-take is required from the open space off Clanage Road to provide a construction compound followed by a smaller maintenance and access point to the DCO Scheme. The loss of this land is considered to be a **slight adverse** significance of effect.
- 1.15.13 Overall, the construction impacts on land used by local communities is not considered significant in regards to the EIA Regulations.

- 1.15.14 The DCO Scheme does not require temporary or permanent land-take from development land identified in the NSDC and BCC local plans.
- 1.15.15 The construction of the DCO Scheme will affect several agricultural holdings due to temporary land-take for construction compounds and haulage roads, permanent land-take for access and maintenance compounds, the loss of informal crossings, and the effects of construction activities such as dust, noise, and lighting, and operational noise on crops and livestock.
- 1.15.16 Construction work will largely be confined to the railway corridors, with the exception of construction compounds and haul roads. Works along the railway may result in indirect effects which could impact on neighbours such as construction noise and dust, and night-time lighting.
- 1.15.17 Several possible sites for construction compounds have been identified, including a small compound off Sheepway and two main compounds off the Portbury Hundred and at Lodway Farm on the west side of Pill. The main construction compounds will be active during weekdays, and possibly at night and at weekends to support specific construction activities, resulting in site noise, construction dust, night-time lighting, and traffic movements to and from the compounds.
- 1.15.18 Further details about the main construction activities and the likely use of construction compounds are being developed as part of the construction strategy. The CoCP will include requirements for the management of construction sites and compounds to minimise adverse impacts on soils, crops, livestock and neighbours.
- 1.15.19 Risks to farmland from the construction compounds are soil compaction, accidental spillages, pollution from temporary storage of contaminated ballast on agricultural land and dust deposition due to the handling of aggregate and waste ballast. These risks will be reduced by good industry practice. Any residual contamination or compaction will be rectified and the land returned to farming in a condition no worse than when it was acquired. Thus, there should be no residual adverse effects on surrounding farmland at the end of the construction phase.
- 1.15.20 Three at-grade farm crossings between Sheepway and The Portbury Hundred will be closed permanently when construction work begins. At Sheepway Gate Farm the existing gate to the field on the south and east side of Sheepway will be widened so that livestock can be moved by trailer if needed. It will also be necessary to provide access off the Portbury Hundred into the proposed construction compound, currently comprising farmland. The landowner will benefit from retaining this new access once the site is handed back to the landowner. The effect is assessed to be **neutral**.
- 1.15.21 Consultations with utility companies is on-going to inform the highways and railway designs. Potential works to relocate utilities will be identified as the design develops. During construction, utilities will be diverted where required or left *in situ*. With good construction practices in place, there should be no risk to the workforce, local communities or the environment. On that basis the effect of the DCO Scheme on utilities is **neutral**.
- 1.15.22 The improved public access to Bristol afforded by the DCO Scheme will improve journey times to Bristol, a major employment and service centre in the region. The train journey time of about 23 minutes compares favourably with the travel time by car of between about 30 minutes off peak and an hour during peak travel times. This will increase the attractiveness of the new areas of residential development being developed in the vicinity of the marina and close to the proposed station. Overall, the impact of the DCO Scheme on the viability and amenity of development land in Portishead is considered to be **beneficial**. No further effects have been identified during the operations phase.



- 1.15.23 The assessment has identified several adverse effects of the DCO Scheme that, subject to further design work, may be significant for the purposes of the EIA Regulations in the absence of mitigation.
- 1.15.24 North Somerset District Council is currently in discussions with landowners and householders regarding temporary and permanent land acquisition. The Environmental Statement will report on the proposals and reach a conclusion on the significance of effects.
- 1.15.25 Mitigation for construction works on agricultural land is under development and will follow Defra's Code of practice for the sustainable use of soils on construction sites.
- 1.15.26 At present, it is not certain whether the garages in Pill need to be demolished, as it will depend on the proposed construction methodology and availability of construction machinery to demolition and rebuild Avon Road Underbridge. If it is necessary to demolish these garages consideration will be given to mitigation.
- 1.15.27 The overall effect of the DCO Scheme on Soils, Agriculture, Land Use and Assets will be confirmed once the detailed design has been completed.

## 1.16 Transport

- 1.16.1 The main highway network in the area is dominated by the M5. Junction 18 in Avonmouth connects to the A4 into Bristol along the north side of the River Avon and Junction 19 at Gordano connects with the A369 between Portishead and Bristol along the south side of the River Avon. Junction 18a on the M5 serves the M49 for South Wales. The B3128 from Clevedon and B3130 from Nailsea provide more circuitous routes into Bristol via the A370 from Weston-super-Mare. The Long Ashton and the Park and Ride lies to the south west of Bristol.
- 1.16.2 The A370 connects with the A369, Brunel Way and the A3029 Winterstoke Road at a complicated junction in Ashton Gate. Brunel Way links with the western end of the A4 Hotwells Road and Bristol city centre on the northern side of the River Avon while the A3029 Winterstoke Road links to the south with the A38 between Bristol and Taunton in the vicinity of Parson Street railway station.
- 1.16.3 There is an existing level crossing over the railway on Ashton Vale Road which connects the A3029 Winterstoke Road and the Ashton Vale Industrial Estate. The industrial estate is bounded by the railway to the east, the A370 to the north, the Long Ashton Park and Ride to the west, and allotments and open land to the south.
- 1.16.4 There are several public rights of way and permissive paths along the railway corridor. The Sustrans National Cycle Network Route includes several of these. Route 41 (the tow path) runs along the western shore of the River Avon, next to the operational railway for much of its length through the Avon Gorge. Route 26 uses parts of the disused railway corridor between the M5 overbridge and Royal Portbury Dock Road overbridge under temporary licence from Network Rail. Route 26 is on a dedicated bridleway to the north of the railway line. At the Royal Portbury Dock Road overbridge, Marsh Lane overbridge and M5 overbridge the route diverts off the bridleway on to permissive paths to go under the road bridges. There are also several footpaths and bridleways criss-crossing the countryside.
- 1.16.5 During construction, without mitigation, the DCO Scheme would have adverse impacts during construction works. The impacts of HGVs and other construction vehicles on the highway network and the delivery of abnormal loads are assessed to be **moderate adverse** on the local road network, but **not significant** on the strategic road network.
- 1.16.6 During construction it may be necessary to have partial or full road closures. The construction works will need to be phased so that alternative routes are readily available

- or the closures minimised on existing route. Traffic management should result in **no significant** impact on the strategic road network but may have a **moderate adverse** impact on the local road network.
- 1.16.7 Construction compounds could have a detrimental localised impact. Traffic management measures will be required within the construction compounds. These should reduce the impact on the highway network and surrounding properties, but the impact may still be **moderate adverse** to the local road network, but **no significant** impact on the strategic road network.
- 1.16.8 As a public transport scheme, the Portishead Branch Line (MetroWest Phase 1) DCO Scheme represents a major enhancement to the local transport network and would promote modal shift away from vehicle use. The DCO Scheme would improve access to employment opportunities such as the Temple Quarter Enterprise Zone and would provide further benefits to those without access to a private car.
- 1.16.9 An analysis of the baseline conditions indicated that many locations on the local highway network are operating within capacity and not suffering from prolonged congestion. The same analysis indicated that there are capacity concerns at specific locations with delays and queue lengths evident.
- 1.16.10 A strategic assessment of the DCO Scheme suggests that there will be reductions in highway demand resulting from the scheme which correspond with an increase in rail demand. However, the model suggests an increase in highway congestion associated with development growth in future years but little change associated with the DCO Scheme.
- 1.16.11 The calculation of the trips to and from Pill and Portishead stations have been informed by the output of the passenger Rail Demand Model. For Portishead station, the data show that, in the 10-year period assessed (2019 to 2029), demand at the station will increase across all modes of transport.
- 1.16.12 The local assessment of the DCO Scheme indicates that the network will be operating within capacity at the majority of locations. The assessment indicates that one location – Winterstoke Road and Ashton Vale Road – would have adverse impacts without mitigation. The proposed station parking would meet demand at both Portishead and Pill stations with the exception of 10 years after opening at Portishead – but provision has been made to accommodate parking for the nearby health centre.
- 1.16.13 The number of walking and cycling trips are forecast to increase and there will be a need to improve provision along identified desire lines. With public transport, it is estimated that the DCO Scheme will lead to an extraction of 25% to 40% demand from existing bus services.
- 1.16.14 With the exception of Ashton Vale Road/Winterstoke Road, a number of modest mitigation measures will be required. These essentially improve access to and in and around the stations and would underpin the level of sustainable trips. The proposed parking controls would have the beneficial effect of reinforcing the use of the station car parks and prevent adverse impacts on neighbouring properties. Elsewhere, some limited measures will be required principally as the result of the realigning existing routes to accommodate the railway line.
- 1.16.15 As a result of the additional trains on the line, the level crossing barriers at Ashton Vale Road would need to operate significantly more often than they do currently. As Ashton Vale Road is the only road access to the industrial estate this could lead to significant access restrictions to the businesses located there and cause traffic queues on both sides of the level crossing. While closure of the existing access to Ashton Vale industrial estate and the provision of an alternative access from the A370 to the north has been considered, more recent VISSIM based modelling has demonstrated that this will not be

required (for Stage 1 of the DCO Scheme). The impact can be mitigated by extending the length of the left-turn lane on the northbound side of Winterstoke Road, upgrading the mode of control of the signals to MOVA and installing a ramp to the north of the level crossing to connect pedestrians and cyclists to Ashton Road and the existing network of at grade and subway footpaths and cycle paths.

- 1.16.16 The scheme has been designed such that there will be no adverse impacts on rail freight operation (refer to section 6.5 of the TA). Timetabling analysis has been undertaken which illustrates that rail freight paths can be accommodated alongside the proposed scheme, providing as many freight paths as are available (albeit not all used) at present.
- 1.16.17 Without mitigation, the DCO Scheme would have adverse impacts during construction works. The mitigation measures evolve around a Traffic Management Plan that focuses upon highway delivery routes, delivery of abnormal loads, phasing of construction and operating periods, traffic management measures and compounds. Implementing these will have the effect of managing the adverse impacts on local residents, businesses and services.
- 1.16.18 Furthermore, as much of the materials to be brought to site and wastes removed from the site will be transported by train as possible. This is particularly required in the Avon Gorge where there is no highway access. This would reduce the number of HGVs required during construction.
- 1.16.19 During operation, the DCO Scheme, and the rest of MetroWest Phase 1, brings the significant benefits of new and enhanced rail access across a wide area.

## 1.17 Water Resources

- 1.17.1 The DCO Scheme extends along the coastal plain of the North Somerset coast and the left<sup>1</sup> (south and west) bank of the River Avon.
- 1.17.2 The coastal plains are drained by an extensive network of small field drains and ditches, many of them heavily overgrown. Two of them, the Portbury Ditch and The Cut, flow through Portishead. The two principal streams between Portishead and Pill are the Drove Rhyne and the Easton-in-Gordano stream. Drove Rhyne rises to the south of the M5 and crosses under the motorway at two locations one on either side of Junction 19, and flows parallel to the railway corridor between Royal Portbury Dock Road and The Drove and then flows north to discharge to the Severn Estuary. The Easton-in-Gordano stream, which is culverted through the village of the same name, flows through part of the port and discharges to the River Avon. Markham Brook is culverted through Pill and discharges to the River Avon. There are also a number of small ponds and marshy, poorly drained areas.
- 1.17.3 At the eastern end of the DCO Scheme in the Ashton Gate area, the railway corridor crosses two streams, Longmoor Brook and Colliter's Brook, both of which are extensively culverted through the urban areas of Bristol, and discharge to the River Avon.
- 1.17.4 Much of the scheme area between Portishead and Pill lies partly within Flood Zones 2 and 3 as defined by the Environment Agency. This area is defended from tidal flooding from the Severn Estuary by existing flood defences, namely the Sea Commissioner's Bank and an inland bund defence. Flood modelling indicates that the disused section of the railway would not be flooded under present-day conditions for all tidal return periods up to the 1000 year event. The Easton-in-Gordano stream is at risk from tidal flooding from the River Avon and fluvial flooding during heavy rainfall. Modelled flood levels are below the railway level for the 1000-year return period tidal and fluvial flood events.

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<sup>1</sup> The left and right hand banks of a river assume the respondent is facing in the downstream direction.

- 1.17.5 Tidally dominated flooding from the Avon in Bristol only affects a small area of the scheme, as much of the existing operational railway line through the Avon Gorge is significantly above the Avon flood plain. The low lying area around Bower Ashton lies in Flood Zone 3 and floods approximately once every 5 to 10 years. The scheme area around Colliter's Brook lies in Flood Zone 2.
- 1.17.6 Over the next 120 years, the forecast rise in sea level due to climate change would increase the risk of flooding. The coastal flood risk between Portishead and Pill is projected to increase to once every 20 to 50 years on average by 2135. Modelled flows in Drove Rhyne and its tributaries suggest that the stream would over top its banks once every 30 to 100 years by 2135 but flood levels would be below the railway level for the 1000-year return period flood. Fluvial flood levels on the Easton-in-Gordano stream floodplain remain below the level of the railway, but tidal floods may rise to once every 200 to 1000 years on average. While in the Bower Ashton area the modelling suggests that this area would flood more frequently than once every two years on average by 2135.
- 1.17.7 The River Avon is tidal throughout the study area and is a transitional waterbody with mixed fresh and saline water. There are extensive intertidal areas along both banks which are exposed at low tide. The river is heavily modified due to flood protection works, navigation and the quay line. The water quality is good and the current ecological quality is stated to be moderate "potential", indicating that the ecology cannot achieve natural conditions due to the heavily modified nature of the water body.
- 1.17.8 The small calcareous water bodies such as the Portbury Ditch, Easton-in-Gordano stream, Markham Brook, and Colliter's Brook are either artificial (drainage ditches) or are heavily modified and there is little information on their water quality and ecology.
- 1.17.9 The current chemical quality of the ground water in the Portishead Mercia Mudstone and the Carboniferous Limestone (Bristol) is good and in the Bristol Triassic it is reported to be poor in the Severn River Basin Management Plan (Environment Agency 2015).
- 1.17.10 The drainage design for the station buildings, car parks and the railway track is ongoing and certain aspects have not been finalised. Further assessment of the drainage design will be undertaken following completion of the design for the hourly or hourly plus scheme.
- 1.17.11 Legislation provides protection of the water environment through requiring discharges to watercourses and ground and abstractions of water to be permitted.
- 1.17.12 During construction the water quality of surface water features could be affected through runoff of contaminants, including silt in surface waters and accidental spillages of contaminating substances such as fuel and cement. Impacts are likely to be temporary and localised. The potential for impacts to water quality will be mitigated through adhering to the mitigation measures that will be outlined in the Code of Construction Practice ("CoCP"). With suitable controls in place and no accidental spillages, a **neutral** significance of effect is assumed.
- 1.17.13 Similarly, accidental pollution events and spillages during construction could affect groundwater quality, but with suitable controls in place, the risk can be minimised. Furthermore, the superficial deposits between Portishead and Pill Junction and the vicinity of Ashton Gate appear to be dominated by silts and clays which being relatively impermeable, will limit infiltration to underlying groundwater. The significance of the effect of construction on groundwater quality is **neutral**.



- 1.17.14 As part of the construction works, existing contaminated ballast material and wooden sleepers will be removed for appropriate treatment. This will result in a long term **negligible to slight beneficial** significance of effect.
- 1.17.15 During construction, the siting of compounds off the floodplain will minimise any risks associated with the temporary loss of floodplain storage during construction. The Clange Road temporary construction site does lie in the flood plain. This site was chosen as a construction compound as it was the only reasonable site close to the southern end of the scheme. A flood plan will be prepared that sets out how the construction activities at this site will be managed around the risk of flooding and agreed with the Environment Agency. There will be overall **neutral** significance on flood risk during construction.
- 1.17.16 Water may be required for construction purposes for example for concrete batching, wheel washing and drinking water supplies. Assuming that the water will be sourced from Bristol Water plc, there will be no impacts on surface or groundwaters, resulting in a **neutral** significance of effect.
- 1.17.17 Construction activities may require works within the channels of watercourses such as for culverting, new outfalls, temporary diversions etc. Such activities can result in changes to the physical characteristics of a water features. Culverts beneath the Portishead to Pill disused section will, where necessary, be refurbished or replaced with culverts of the same dimension except for the Easton-in-Gordano stream which will have a larger culvert. Where works are required within 8 m of the top of the bank of a watercourses (9 m for watercourses managed by the North Somerset Levels Internal Drainage Board) these will be subject to the consenting process and best practice for works near watercourses. Provided that these measures are in place, it is assumed that all impacts will be reduced to ensure that the residual effect is **neutral**.
- 1.17.18 During the operational phase, runoff from the railway line will be no higher than present, as there will be no increase in impermeable area. Therefore no impacts are anticipated.
- 1.17.19 Runoff rates from the site of Portishead station, Pill station, and Winterborne Road will increase as a result of the increase in impermeable areas for the new stations, car parks and highways. The drainage design for the station buildings and car parks is ongoing and certain aspects have not been finalised. Further assessment of the drainage design will be undertaken following completion of the design for the hourly plus scheme, and will include measures to minimise any potential increase in discharge. With these measures in place this is likely to result in no material effect on runoff as a result and the residual effect is **neutral**.
- 1.17.20 A flood plan will be prepared following Network Rail's procedures to safeguard passengers and the railway services in the event of a flood. Overall the completed railway is not expected to increase significantly impacts on flood risk during its operation. These impacts are considered to have a **neutral** significance of effect on flood risk.
- 1.17.21 Given the proposals for ballast renewal, track and station drainage, and the appropriate management of wastewater from trains the impacts associated with the potential for pollutants to enter the surface water environment will be mitigated to acceptable levels resulting in a **neutral** significance effect on water resources.
- 1.17.22 The impacts upon water quality to surface and groundwaters through drainage from both the track, stations, car parks and highways during the operational phase are anticipated to be of **neutral** effect.

- 1.17.23 The physical impacts upon water features through drainage from the track, stations, car parks and highways during the operational phase based on designs and understanding at this stage, are anticipated to be of either **slight adverse** or **neutral** effect.
- 1.17.24 Maintenance activities will be undertaken in accordance with National Rail standards. Therefore any maintenance activities are anticipated to have an impact of negligible magnitude on all aspects of the water environment, resulting in a **neutral** significance of effect for all potential receptors.
- 1.17.25 With the measures to be built into the scheme design and its construction, at this stage of the assessment, no residual significant environmental effects have been identified for the water environment.
- 1.17.26 Once the initial design has been completed, further consideration will be given to the need to provide compensatory flood storage.
- 1.17.27 The overall effect of the DCO Scheme on water resources during construction and operation is assessed as not significant in regards to the EIA Regulations.

## 1.18 Cumulative Effects

- 1.18.1 The in-combination and the cumulative effects are defined by the Institute of Environmental Management and Assessment ("IEMA") as follows.
- In-combination effects: *"These effects occur between different environmental topics within the same proposal, as a result of that development's direct effects."*
  - Cumulative effects: *"This form of cumulative effect occurs as a result of the likely impacts of the proposed development interacting with the impacts of other developments in the vicinity."*
- 1.18.2 During construction, the in-combination effects include loss of vegetation during land preparation works, activities at the construction sites and compounds, emissions such as noise, lighting and dust, risk of construction accidents, discharge to receiving waters and flood risk. The receptors most likely to be affected by multiple effects adjoin or are located close to the proposed construction sites, construction compounds and haulage routes.
- 1.18.3 During operation, the in-combination effects include the visual impact of the new station and other physical features, operational noise, night-time lighting, and activity at the stations due to traffic and travellers. The receptors most likely to be affected by multiple effects adjoin or are located close to the new stations and car parks and along the railway line.
- 1.18.4 The assessment of cumulative effects has identified five developments that may lead to multiple adverse cumulative effects with the DCO Scheme.
- 1.18.5 The Bristol Port Company's proposal for hardstanding for cargo storage and a bridge over the railway line at Court House Farm together with the DCO Scheme may result in adverse cumulative effects on ecology and biodiversity, landscape and views, the setting of Court House Farm (Grade II listed), and construction traffic. The proposed development was granted planning permission on 21 December 2016 and is under construction.
- 1.18.6 A planning application has been put forward to construct 93 residential apartments and office floor space with associated car parking, landscaping and servicing at Harbour Crescent, Serbert Road. This site is close to the proposed Portishead Station. Together the two schemes may result in adverse effect on traffic and transport if construction phases coincide, and there is potential for adverse effects on ecology, landscape and views due to habitat loss and vegetation clearance.

- 1.18.7 The alignment of transmissions lines for the National Grid Hinkley Point C Connection DCO Scheme crosses the Portishead Branch Line DCO Scheme on the eastern outskirts of Portishead near Sheepway. The programme for the construction phase for the National Grid DCO Scheme is not known. If the construction of the National Grid Scheme coincides with the construction of the Portishead Branch Line DCO Scheme, there could be potential significant interference between the two projects, particularly around the location of construction compounds, construction traffic and the cumulative impact on the Portbury Wharf Nature Reserve. The proposed construction compounds for the Portishead Branch Line have been selected avoiding the sites preferred by National Grid and the development of off-site mitigation in the Nature Reserve will take into consideration the potential impact of the construction of the National Grid scheme. The cumulative effect of the National Grid project with the Portishead Branch Line on traffic is considered to be moderate adverse for traffic, potentially adverse for landscape and views and neutral for other topics.
- 1.18.8 Bristol City Council's Site Allocations and Development Management Policies includes Site Allocation for redevelopment of part of Alderman Moore's Allotments. This proposed development consists of approximately 131 dwellings with associated private gardens, car parking, open space and access roads, the dwellings to include a mix of bungalows, flats and two and three storey properties. Due to lack of information about this proposal it has not been possible to assess the significance of any adverse cumulative effects.
- 1.18.1 The West of England Joint Spatial Plan and Transport Study Draft Strategy includes several proposals that may result in adverse cumulative effects on multiple receptors when combined with the DCO Scheme. However, as these proposals are in the early stages of development, the significance of potential effects are uncertain at this point. As more information becomes available on these plans, cumulative effects will be reassessed.

## 1.19 Next Steps

- 1.19.1 Statutory consultation is being held between 23 October and 4 December 2017. A series of staffed exhibitions are being held in November 2017.
- 1.19.2 Following consultation, the comments received will be reviewed, update the Preliminary Environmental Information (PEI) Report. Undertake the final assessment of the emerging design and update the Environmental Statement.
- 1.19.3 The main milestones to implement the DCO Scheme are summarised below.
- Submission of the DCO Application, including the Environmental Statement, to The Planning Inspectorate in spring 2018.
  - DCO post-application examination and decision stages from autumn 2018 to autumn 2019.
  - Detailed highway and railway engineering design – summer 2018 to summer 2019.
  - Construction phase – spring 2020 to late 2021.
  - Project opening – late 2021.

## 1.20 References

IEMA, 2011. The State of Environmental Impact Assessment Practice in the UK.

## 1.21 Abbreviations

AOD                      Above Ordnance Datum

AQMA	Air Quality Management Area
BCC	Bristol City Council
CEMP	Construction Environmental Management Plan
CoCP	Code of Construction Practice
DCO	Development Consent Order
EIA	Environmental impact assessment
ES	Environmental Statement
IEMA	Institute of Environmental Management and Assessment
NRR	National Nature Reserve
NSDC	North Somerset District Council
NSIP	Nationally significant infrastructure project
NTS	Non-Technical Summary
PEI Report	Preliminary Environmental Information Report
SAC	Special Area of Conservation
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest