

PORTISHEAD BRANCH LINE PRELIMINARY
ENVIRONMENTAL INFORMATION REPORT
VOLUME 2

CHAPTER 19

Conclusions



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CHAPTER 19

Conclusions

19.1 Introduction

- 19.1.1 The MetroWest Phase 1 project was mobilised in 2013 and includes proposals to operate an hourly passenger train service on the Portishead Branch Line.
- 19.1.2 The hourly service 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.
- 19.1.3 This concluding chapter presents an overview of the main findings of the effects of the Portishead Branch Line DCO Scheme on people, local communities and the environment based on the studies undertaken to date.

19.2 Design and Mitigation

- 19.2.1 The outline design for the highway works is being led by North Somerset District Council and is largely completed.
- 19.2.2 An iterative design process is being 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. This process will continue as the design for the hourly scheme is completed.
- 19.2.3 A number of measures have been included as part of the project design in order to minimise certain environmental effects. This includes:
- careful designing of the project to ensure key receptors are avoided where possible;
 - construction adopting best practices 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.
- 19.2.4 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.
- 19.2.5 The Environmental Statement will fully set out and detail the embedded mitigation measures incorporated into the scheme design, the impacts of the DCO Scheme during construction and operation, any additional mitigation, compensation and enhancement measures, and the residual environmental effects of the DCO Scheme.

19.3 The Planning Framework

- 19.3.1 An appraisal of the DCO Scheme's compliance with planning policy will be carried 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").
- 19.3.2 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.
- 19.3.3 The proposed location of Portishead station and the railway corridor have been safeguarded in local policy plans for over a decade.

19.4 Air Quality

- 19.4.1 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 ("NO₂") for the 1-hour mean and annual mean objectives and particulate matter ("PM₁₀") for the 24-hour mean objective. 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.
- 19.4.2 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**.
- 19.4.3 The proposed hourly or 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 considered to be significance in relation to the EIA Regulations.
- 19.4.4 The overall effect of the DCO Scheme on air quality during construction and operation is assessed as **not significant**.

19.5 Cultural Heritage

- 19.5.1 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**.

- 19.5.2 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.
- 19.5.3 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 trains which would be lit at night, and changes in the ambience of the heritage asset due to higher noise levels for the brief periods when trains are passing. 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.
- 19.5.4 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 adverse effects are considered to be not significant in regard to the EIA Regulations.
- 19.5.5 The 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.

19.6 Ecology and Biodiversity

- 19.6.1 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.
- 19.6.2 The construction works will not 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.
- 19.6.3 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.
- 19.6.4 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 plant species, and loss of habitat for protected species of fauna. Unmitigated this is assessed to result in a **long term major adverse** effect.
- 19.6.5 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.
- 19.6.6 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.
- 19.6.7 The DCO Scheme requires about 6450 m² 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.
- 19.6.8 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.
- 19.6.9 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**.
- 19.6.10 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 security 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.
- 19.6.11 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.
- 19.6.12 There is a risk of increased sedimentation and pollution incidents affecting watercourses which cross construction sites.
- 19.6.13 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.
- 19.6.14 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.
- 19.6.15 The proposed works will result in the direct loss of five outlier badger 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.
- 19.6.16 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.
- 19.6.17 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**.
- 19.6.18 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.
- 19.6.19 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.
- 19.6.20 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 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.
- 19.6.21 Operational impacts on overwintering birds and waterfowl using the Severn Estuary SPA/Ramsar/SSSI is predicted to be **neutral** and not significant.
- 19.6.22 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.
- 19.6.23 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**.

- 19.6.24 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.
- 19.6.25 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.
- 19.6.26 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.
- 19.6.27 The operational effects on watercourses are considered to be **neutral** and not significant.
- 19.6.28 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.
- 19.6.29 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.
- 19.6.30 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.
- 19.6.31 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.
- 19.6.32 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.
- 19.6.33 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.
- 19.6.34 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.

19.7 Ground Conditions

- 19.7.1 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.

- 19.7.2 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. The ballast will be removed and either treated and reused on other schemes or disposed of in accordance with Network Rail's procedures.
- 19.7.3 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.
- 19.7.4 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.
- 19.7.5 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.
- 19.7.6 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.
- 19.7.7 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.
- 19.7.8 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.
- 19.7.9 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.
- 19.7.10 The overall effect of the DCO Scheme on ground conditions during construction and operation is assessed as **not significant**.

19.8 Landscape and Visual Impact

- 19.8.1 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.
- 19.8.2 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.
- 19.8.3 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.
- 19.8.4 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.
- 19.8.5 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.
- 19.8.6 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.
- 19.8.7 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 extent of visual intrusion from the removal of vegetation, especially between the railway and the River Avon Tow Path, and possibly on the cliff faces due to stone-picking.
- 19.8.8 In site specific character areas, the construction works would have a **moderate adverse** effect on the immediate surrounds in Portishead, Sheepway, Pill, and the Avon Gorge and a **slight adverse** effect elsewhere.
- 19.8.9 There would be views of the construction works from the periphery of several conservation areas, resulting in a **slight adverse** effect in relation to the edge of the conservation area. 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 and there would be some loss of vegetation adjacent to the track. The effect of the construction works on this conservation area is assessed as **moderate adverse**. Leigh Woods Conservation Area does not have views of the DCO Scheme so would be unaffected.
- 19.8.10 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.
- 19.8.11 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.
- 19.8.12 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.
- 19.8.13 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.
- 19.8.14 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.
- 19.8.15 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.
- 19.8.16 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.
- 19.8.17 The DCO Scheme only crosses through a small portion 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. 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. Overall the DCO Scheme is assessed to have a **slight adverse** significance of effect on the Avon Gorge local authority character area.
- 19.8.18 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 point for signalling equipment, would introduce a transport related feature into an otherwise mostly residential area.
- 19.8.19 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.

19.8.20 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 Green and is hidden from view in Pill Tunnel.
- In Sea Mills, while the DCO Scheme will introduce new passenger trains into the landscape 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 new 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.

19.8.21 The setting of listed buildings, conservation areas, scheduled monuments and registered parks and gardens are generally unaffected. 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.

19.8.22 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

19.8.23 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.

- 19.8.24 The overall effect of the DCO Scheme on landscape and visual impact will be confirmed once the detailed design has been completed.

19.9 Materials and Waste

- 19.9.1 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.
- 19.9.2 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.
- 19.9.3 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.
- 19.9.4 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.
- 19.9.5 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.
- 19.9.6 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).
- 19.9.7 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 covers a large proportion of the value of the DCO Scheme.
- 19.9.8 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.
- 19.9.9 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.
- 19.9.10 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.
- 19.9.11 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.

19.10 Noise and Vibration

- 19.10.1 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 will be given to developing mitigation measures to reduce this impact.
- 19.10.2 During the operation phase, the hourly or hourly plus 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.
- 19.10.3 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**.
- 19.10.4 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.
- 19.10.5 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**.
- 19.10.6 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.
- 19.10.7 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.

- 19.10.8 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.
- 19.10.9 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.
- 19.10.10 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.
- 19.10.11 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.
- 19.10.12 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.

19.11 Socio-economics and Regeneration

- 19.11.1 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.
- 19.11.2 During construction, the Portishead Branch Line is expected to result in a **moderate positive** socio-economic effect, through the creation of employment in the construction sector, uplift and indirect benefits through increased economic activity in the construction supply chain.
- 19.11.3 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.
- 19.11.4 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.
- 19.11.5 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.
- 19.11.6 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.
- 19.11.7 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.
- 19.11.8 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.
- 19.11.9 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.
- 19.11.10 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.

19.12 Soils, Agriculture, Land Use and Assets

- 19.12.1 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 may, depending on the construction methodology, include the demolition of a section of garden wall and 12 garages to manoeuvre a large crane into position. 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 property on Station Road has been acquired by North Somerset District Council. 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.
- 19.12.2 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 in case some machinery slips down the slope into the gardens. This would be a **slight adverse** significance of effect.
- 19.12.3 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.
- 19.12.4 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.
- 19.12.5 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**.
- 19.12.6 Temporary and a smaller area of permanent land-take is required from the open space off Clange 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.
- 19.12.7 Overall, the construction impacts on land used by local communities is not considered significant in regards to the EIA Regulations.
- 19.12.8 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.
- 19.12.9 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.
- 19.12.10 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.
- 19.12.11 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.
- 19.12.12 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**.

- 19.12.13 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**.
- 19.12.14 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.
- 19.12.15 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.
- 19.12.16 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.
- 19.12.17 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.
- 19.12.18 The overall effect of the DCO Scheme on Soils, Agriculture, Land Use and Assets will be confirmed once the detailed design has been completed.

19.13 Transport

- 19.13.1 During construction, without mitigation, the DCO Scheme would have adverse impacts during construction works. The impact 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.
- 19.13.2 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.
- 19.13.3 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.
- 19.13.4 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.
- 19.13.5 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.
- 19.13.6 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.

- 19.13.7 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. 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 pedestrian 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.
- 19.13.8 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.
- 19.13.9 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.
- 19.13.10 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.

19.14 Water Resources

- 19.14.1 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.
- 19.14.2 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**.
- 19.14.3 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.
- 19.14.4 During construction, the siting of compounds off the floodplain will minimise any risks associated with the temporary loss of floodplain storage during construction. The Clanage 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.
- 19.14.5 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.
- 19.14.6 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**.
- 19.14.7 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.
- 19.14.8 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**.
- 19.14.9 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.
- 19.14.10 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.
- 19.14.11 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.
- 19.14.12 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.
- 19.14.13 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.

- 19.14.14 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.
- 19.14.15 Once the initial design has been completed, further consideration will be given to the need to provide compensatory flood storage.
- 19.14.16 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.

19.15 Cumulative Effects

- 19.15.1 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.
- 19.15.2 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.
- 19.15.3 The assessment of cumulative effects has identified five developments that may lead to multiple adverse cumulative effects with the DCO Scheme.
- The Bristol Port Company's development of a new car storage area and bridge over the disused railway at Court House Farm.
 - A planning application to construct 93 residential apartments and office floor space with associated car parking, landscaping and servicing at Harbour Crescent, Serbert Road.
 - The National Grid Hinkley Point C Connection DCO Scheme, which crosses the Portishead Branch Line DCO Scheme at Sheepway.
 - Bristol City Council's Site Allocation BAS1001 for redevelopment of part of Alderman Moore's Allotments for housing.
 - The West of England Joint Spatial Plan consultation draft which includes provision for housing in the Greater Bristol area.
- 19.15.4 The assessment of cumulative effects of these projects in combination with the DCO Scheme will be updated for the Environmental Statement.

19.16 Next Steps

- 19.16.1 Statutory consultation is being held between 23 October and 4 December 2017. A series of staffed exhibitions are being held in November 2017.
- 19.16.2 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.
- 19.16.3 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.

19.17 References

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

19.18 Abbreviations

B&NES	Bath & North East Somerset Council
BCC	Bristol City Council
BES	British Environmental Standard
BRE	Buildings Research Establishment
CCA	Climate Change Agreements
CCL	Climate Change Levy
CD&E	Construction, demolition, and excavation
CoCP	Code of Construction Practice
CRCEES	Carbon Reduction Commitment Energy Efficiency Scheme
DCO	Development Consent Order
DfRE	Design for Resource Efficiency
DMRB	Design Manual for Roads and Bridges
EIA	Environmental impact assessment
ES	Environmental Statement
ESOS	Energy Saving Opportunities Scheme
ETS	Emissions Trading Scheme
EU	European Union
FSC	Forestry Stewardship Council
GHG	Greenhouse Gases
GRIP	Governance for Railway Investment Projects
GWRM	Great Western Route Modernisation
HA	Highways Agency
IAN	Interim Advice Note
IEMA	Institute of Environmental Management and Assessment
IPPC	Intergovernmental Panel on Climate Change
JWCS	Joint Waste Core Strategy
MPA	Minerals Planning Authority
Mt	million tonnes
NPPF	National Planning Policy Framework
NPSNN	National Policy Statement for National Networks
NR	Network Rail
NSDC	North Somerset District Council
NSIP	Nationally significant infrastructure project
NTMRC	National Track Materials Recycling Centre
PAS	Publicly Available Specification
PEFC	Programme for the Endorsement of Forest Certification
PEI Report	Preliminary Environmental Information Report
SGC	South Gloucestershire Council
SWMP	Site Waste Management Plan
t/annum	tonnes per annum (per year)

tCO_{2e} tonnes of carbon dioxide equivalent
SWMP Site waste management plan
WRAP Waste and Resources Action Programme

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