

Appendix 7E

Water Framework Directive Compliance Assessment

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1. Introduction

1.1 Background to this Assessment

- 1.1.1 This Appendix has been produced to demonstrate how the HyNet North West Hydrogen Pipeline Project (the 'Project') complies with the requirements of the European Union's Water Framework Directive (WFD)¹, as implemented in domestic law by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017².
- 1.1.2 The WFD needs to be taken into account in the planning of all new activities in the water environment and the Environment Agency, as the competent authority in England and Wales, is responsible for delivering the Directive through the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.
- 1.1.3 This Appendix covers all aspects of WFD compliance and draws conclusions on WFD compliance based on the outputs of several chapters of the Environmental Statement (ES) including **Chapter 7: Water Environment** and **Chapter 5: Biodiversity**.
- 1.1.4 The Project is a Nationally Significant Infrastructure Project (NSIP), which will be authorised by a Development Consent Order (DCO). The Environment Agency is the relevant permitting authority in its role in issuing Environmental Permits under the Environmental Permitting (England and Wales) Regulations 2016³.
- 1.1.5 In England, whilst the responsibility for ensuring that the WFD is implemented lies with the Environment Agency, public bodies have a duty to 'have regard' to the objectives of the WFD in exercising their functions. In the case of the Project, this includes Lead Local Flood Authorities (LLFA) which are responsible for consenting works in Ordinary Watercourses. In addition, Natural England has the responsibility for ensuring compliance with the Objectives and Measures associated with Natura 2000 sites (UK National Site Network), designated as Protected Areas under the WFD. As noted in the Planning Inspectorate's *Advice Note Eighteen: the Water Framework Directive* (The Planning Inspectorate,

1 European Commission (2000) European Union Water Framework Directive (WFD). (Online). Available at: <https://eur-lex.europa.eu/eli/dir/2000/60/oj> (Accessed 27 August 2024)

2 UK Government (2017). The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. (Online). Available at: <https://www.legislation.gov.uk/ukxi/2017/407/contents> (Accessed 27 August 2024)

3 UK Government (2016). The Environmental Permitting (England and Wales) Regulations 2016. (Online). Available at: <https://www.legislation.gov.uk/ukxi/2016/1154/contents> (Accessed 27 August 2024)

2017⁴), the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 place these duties on each public body to exercise their functions to secure compliance with the WFD and in particular with regard to relevant River Basin Management Plans (RBMPs).

1.2 Structure of this Assessment

1.2.1 This WFD compliance assessment is structured as follows:

- **Section 1: Introduction** outlines the legislative requirements and context of the WFD in respect of the Project.
- **Section 1.4: Data collection** sets out the sources of data used and surveys undertaken to inform the WFD compliance assessment.
- **Section 3: WFD assessment methodology** provides an overview of the methodology that has been adopted to undertake the WFD compliance assessment.
- **Section 4: Screening** sets out the process for determining which Project activities and WFD waterbodies do not require further consideration ('screened out') and those that require detailed assessment ('screened in').
- **Section 5: Scoping assessment** is a receptor-based exercise that considers the potential effects of screened in activities against screened in water bodies, which need to be scoped in for further assessment.
- **Section 6: WFD impact assessment** sets out the approach to, and outcomes of a further, detailed assessment of those relatively high-risk activities that were scoped in as part of the scoping assessment presented in **Section 5**.
- **Section 7.6: Conclusions on WFD compliance** summarises the outputs from **Sections 4, 5 and 6** to reach a conclusion on the compliance of the Project with the objectives of the WFD.
- **Section 8: Glossary of terms and abbreviations.**

Design of the Project to facilitate WFD compliance

1.2.2 As a general principle, the Project has been designed to minimise the impact to water bodies and WFD objectives; first by minimising direct contact between construction, operation/maintenance and decommissioning activities and surface water bodies, and second by incorporating appropriate embedded environmental measures where infrastructure has to pass over, under or through water bodies. These embedded environmental measures are considered in this WFD

4 The Planning Inspectorate (2017). Nationally Significant Infrastructure Projects - Advice Note Eighteen: the Water Framework Directive. (Online). Available at <https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-18/> (Accessed 22 August 2024)

assessment (See **Sections 5 to 7**) and where/if required additional mitigation is proposed.

1.3 Legislative Context

Overview

- 1.3.1 The WFD (2000/60/EC)⁵ came into force in 2000 and was originally transposed into UK law in 2003⁶. Although the UK is now no longer a European Union (EU) Member State the Directive remains relevant as the transposed regulations are part of the UK's legal framework⁷. The principal aims of the WFD are to protect and improve the water environment and promote the sustainable use of water. Environmental Quality Standards (EQSs; 2008/105/EC⁸) for priority substances⁹ were set by the daughter directive to the WFD (the EQS Directive and subsequent amendments (EQSD; 2013/39/EU¹⁰) and the Groundwater Directive

5 European Commission (2000). Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy. (Online) Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32000L0060> (Accessed 27 August 2024).

6 The original 2003 enabling regulations have since been superseded in England and Wales by the current Water Environment (Water Framework Directive) (England and Wales) Regulations 2017, which came into force on 10 April 2017.

7 UK Government (2017) Water Resources, England and Wales, The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (2017). (Online). Available at: https://www.legislation.gov.uk/ukxi/2017/407/pdfs/ukxi_20170407_en.pdf (Accessed 27 August 2024)

8 European Commission (2008). Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council. (Online) Available at: <https://www.legislation.gov.uk/eudr/2008/105/contents> (Accessed 27 August 2024).

9 The Environment Agency list of priority substances is available on the Environmental Quality Standards Directive (EQSD) list for WFD assessments (2016). (Online). Available at: <https://www.gov.uk/government/publications/list-of-chemicals-for-water-framework-directive-assessments/environmental-quality-standards-directive-eqsd-list-for-wfd-assessments> (Accessed 27 August 2024)

10 European Commission (2013). Directive 2013/39/EU of the European Parliament and of the Council of 12 August 2013 amending Directives 2000/60/EC and 2008/105/EC as regards priority substances in the field of water policy Text with EEA relevance. (Online) Available at: <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32013L0039> (Accessed 27 August 2024).

(2006/118/EC¹¹). The environmental objectives of the WFD and its daughter directives are to:

- prevent deterioration of aquatic ecosystems;
- protect, enhance and restore water bodies to 'Good' Status; which is based on ecology (with its supporting hydromorphological and physico-chemical quality elements) and chemical factors for surface water, and water quantity and chemical status for groundwater;
- comply with water-related standards and objectives for environmentally protected areas established under other EU legislation;
- progressively reduce pollution from priority substances and cease or phase out discharges of priority hazardous substances; and
- prevent or limit the input of pollutants into groundwater and reverse any significant or sustained upward trends in the concentration of any groundwater pollutant.

1.3.2 The WFD sets a default objective for all rivers, lakes, estuaries, groundwater and canal water bodies to achieve Good Status by 2027 at the latest. Where it is not possible to achieve Good Status by 2027, alternative waterbody objectives can be set. The current (baseline) status and the measures required to achieve the 2027 Status Objective are set out for each waterbody in the relevant RBMPs, as prepared by the Environment Agency every six years. The first RBMPs were published in 2009, and the current Cycle 3 RBMPs were published in October 2022. The plans provide the baseline condition of the water environment at the time of publication and indicate the measures needed and timescales required to attain their target status.

Surface waters

1.3.3 For surface water bodies (rivers, transitional water bodies, canals and lakes), overall waterbody status has an ecological and a chemical component. Ecological Status is measured on the scale of High, Good, Moderate, Poor and Bad. Chemical Status is measured as Good or Fail, based on the presence or absence of priority substances which present a risk to the environment. Good Ecological Status (GES) is defined as a slight variation from undisturbed natural conditions, with minimal distortion arising from human activity.

1.3.4 Whilst GES is defined as a slight variation from undisturbed conditions in 'natural' water bodies, surface water bodies can also be designated as artificial or heavily modified water bodies (AWBs or HMWBs). These designations apply where there has been significant human influence on the nature of the waterbody such that they are considered to be unable to achieve the standards required to attain GES. Instead, AWBs and HMWBs have a target to achieve Good

11 European Commission (2006). Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration. (Online) Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32006L0118> (Accessed 27 August 2024)

Ecological Potential (GEP), which recognises their essential human use/s (e.g. flood protection, navigation), whilst making sure ecology is protected and enhanced as far as possible. The Ecological Potential for AWBs and HMWBs is measured on the scale High, Good, Moderate, Poor and Bad.

- 1.3.5 For rivers, transitional waters and lakes, hydromorphology is a supporting element of the WFD. At Good and Moderate Ecological Status, hydromorphological conditions are not defined but are to be *"consistent with the achievement of the values specified for the biological quality elements"*¹. Hydromorphology elements are only specifically assessed for High Status water bodies. Surface water morphology is important not only for defining water bodies at High Status, or for investigating possible reasons for water bodies that fail to reach Good Ecological Status, it also has an important role to play in characterising and setting in place appropriate monitoring of HMWBs and AWBs.
- 1.3.6 For AWBs and HMWBs, Ecological Potential is measured based on the presence or absence of a list of mitigation measures. These measures are set in order for the sensitive ecological elements to achieve the best aquatic health possible without compromising the human use of the waterbody. Ecological elements that are not affected by the heavily modified or artificial nature of the waterbody are measured in the same way and with the same standards as for natural water bodies. Similarly, the chemical Status of AWBs and HMWBs is also measured and classified in the same way as for natural water bodies. For a HMWB or AWB to achieve GEP it requires all the relevant mitigation measures to be in place and for the physico-chemical elements to also be at good status.
- 1.3.7 In order for a surface waterbody to attain good 'overall' Status or Potential, it must meet the requirements of GES or GEP, and achieve good chemical Status. The achievement of Good Status or Potential by 2027 at the latest is the default WFD objective for almost all water bodies in the UK where they are not already at good status. Where they are at good status the objective is to maintain this.
- 1.3.8 The Ecological Status/Potential of water bodies is determined by examining biological elements (e.g. fish, invertebrates, plants) and a number of supporting elements and conditions, including physico-chemical (e.g. metals and organic compounds), and hydromorphological (e.g. depth, width, flow, and 'structure') quality elements. These elements are summarised in **Table 7E.1**.

Table 7E.1 WFD classification elements for rivers, transitional, lakes and canal WFD surface water bodies

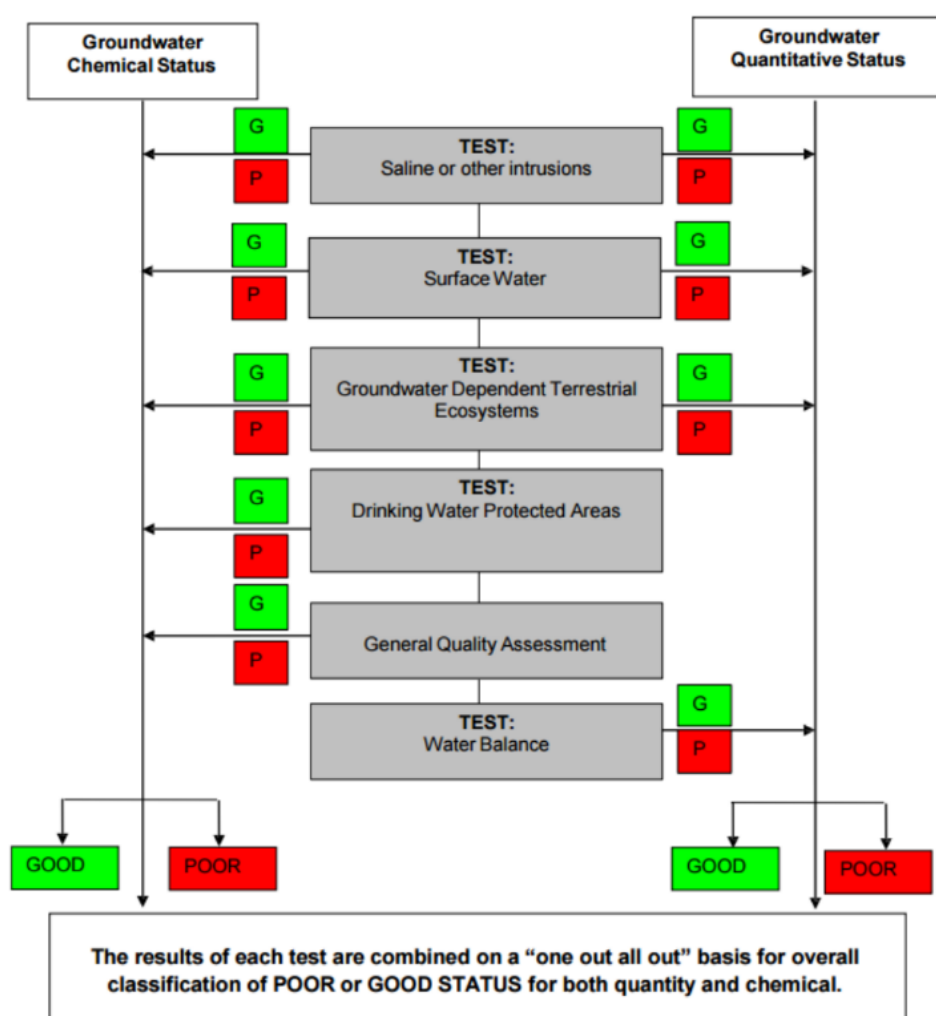
Waterbody type	Biological	Physio-chemical and chemical	Hydromorphological
Rivers	Macrophytes Phytobenthos Benthic invertebrates Fish	• Thermal conditions • Dissolved oxygen • Acidification • Nutrients • Salinity • Organic pollutants • Pollution by substances being	<u>Hydrological regime:</u> • quantity and dynamics of water flow; and • connection to groundwater bodies.

Waterbody type	Biological	Physio-chemical and chemical	Hydromorphological
	(mitigation measures assessment)	discharged, e.g. chemicals, metals, pesticides.	<u>River continuity morphological conditions:</u> - river depth and width variation; - structure and substrate of the river bed; and - structure of the riparian zone.
Transitional Waters (HMWB/AWB)	Phytoplankton Other aquatic flora Benthic invertebrates Fish (mitigation measures assessment)	- Transparency - Thermal conditions - Dissolved oxygen - Nutrients - Salinity - Pollution by substances being discharged e.g. chemicals, metals, pesticides.	<u>Tidal regime:</u> - freshwater flow; and - wave exposure. <u>Morphological conditions:</u> - depth variation; - quantity, structure and substrate of the bed; and - structure of the intertidal zone.
Lakes (HMWB/AWB)	Phytoplankton Other aquatic flora Macrophytes Phytobenthos Benthic invertebrates Fish (mitigation measures assessment)	- Thermal conditions - Oxygenation - Salinity - Acidification - Nutrient conditions - Total Nitrogen - Phosphorous - River Basin specific pollutants	<u>Hydrological regime</u> - Lake depth variation - Quantity, structure and substrate of the lake bed; and - Structure of the lake shore.
Canals (HMWB/AWB)	Macrophytes Phytobenthos Benthic invertebrates Fish (mitigation measures assessment)	- Thermal conditions - Dissolved oxygen - Acidification - Nutrients - Salinity - Organic pollutants - Pollution by substances being discharged, e.g. chemicals, metals, pesticides.	N/A

Groundwater

- 1.3.9 For groundwater bodies, Good Status has quantitative and chemical components that are assessed via a series of ‘tests’, as shown in **Graphic 1.1**. Together, these provide a single final classification: good or poor Status. Quantitative Status is evaluated based on overall aquifer water balance, impacts of abstraction on dependent surface waters or wetlands and potential for saline intrusion. Chemical Status is evaluated based on evidence for impacts of poor water quality on dependent surface waters or wetlands or deterioration of the quality of groundwater used for potable supply.

Graphic 1.1 Overview of the groundwater classification elements (UKTAG, 2012¹²)



12 UK technical Advisory Group on the Water Framework Directive (2008). UK Environmental Standards and Conditions (Phase 1). (Online). Available at: https://www.wfduk.org/sites/default/files/Media/Environmental%20standards/Environmental%20standards%20phase%201_Finalv2_010408.pdf (Accessed 27 August 2024)

- 1.3.10 The WFD and specifically the Groundwater Directive 2016¹³, requires the prevention of any input of priority substances and limiting (or control) of the input of all other substances to groundwater to prevent the deterioration of Ground Waterbody Status.

Protected Areas

- 1.3.11 Consideration must be paid to protected areas that are designated under European legislation and now transposed into UK regulations as part of the UK's own legal framework. These include drinking water, bathing water and Natura 2000 protected areas.
- 1.3.12 There are two Drinking Water Safeguard Zones within the Study Area (as defined in **Section 4.2** of this Appendix) they are:
- Winwick and
 - Frodsham.
- 1.3.13 The EU Nitrates Directive (European Commission, 1991¹⁴) and Urban Waste Water Treatment Directive (European Commission, 1991¹⁵) areas that are within the Study Area are:
- Sankey Brook (Black Brook to Mersey) Nitrate Vulnerable Zone (NVZ);
 - Whittle Brook NVZ;
 - River Weaver (Dane to Frodsham) NVZ;
 - Peckmill Brook, Hoolpool Gutter at Ince Marshes NVZ;
 - Delamere Sands (groundwater); and
 - River Gowy (Milton Brook to Mersey) NVZ.
- 1.3.14 The National Site Network areas that are within the Study Area are:
- Mersey Estuary Special Protection Area (SPA).
- 1.3.15 There are no Special Areas of Conservation within the Study Area.

13 UK Government (2016). The Groundwater (Water Framework Directive) (England) Direction 2016. (Online). Available at: [The Groundwater \(Water Framework Directive\) \(England\) Direction 2016 - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/544441/groundwater-direction-2016.pdf) (Accessed 27 August 2024).

14 European Commission (1991). Council Directive of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources (91/676/EEC). (Online) Available at: <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex%3A31991L0676> (Accessed 27 August 2024).

15 European Commission (1991). Council Directive of 21 May 1991 concerning urban waste-water treatment (91/271/EEC). (Online) Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A31991L0271> (Accessed 27 August 2024).

- 1.3.16 Each of the protected sites are considered in **Section 6** of this Appendix within the assessment process as a component of the WFD waterbody that they fall within.
- 1.3.17 The EU's revised Bathing Water Directive (rBWD) came into force in March 2006 and replaced the 'current Bathing Water Directive (cBWD)' (76/160/EEC¹⁶). The rBWD provides more stringent standards than the cBWD and places an emphasis on providing information to the public. The Bathing Water Directive is transposed into domestic law in England under The Bathing Water (Amendment) (England) Regulations 2018¹⁷.
- 1.3.18 As there are no Bathing Waters within the Study Area, this is not considered further in this Appendix.

1.4 Consultation

Full details of all Statutory consultation responses received in relation to the Water Environment and information on how the consultation responses have informed the completion of this WFD assessment is presented within **Appendix 7A: Scoping opinion and statutory consultation**.

16 European Commission (2006). Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC. (Online) Available at: <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:32006L0007> (Accessed 27 August 2024).

17 UK Government (2018). The Bathing Water (Amendment) (England) Regulations 2018, (Online). Available at: <https://www.legislation.gov.uk/uksi/2018/527/contents/made> (Accessed 29 August 2024)

2. Data Collection

2.1 Desk Study

2.1.1 This assessment has been informed by a desk study which reviewed the available information to develop a baseline for the Study Area. The following data sources were used in the desk study:

- Environment Agency Catchment Data Explorer¹⁸;
- The Department for Environment, Food and Rural Affairs (Defra) MAGIC map¹⁹;
- Environment Agency Ecology and Fish Data Explorer²⁰;
- North West River Basin Management Plan²¹;
- Modern and recent historic Aerial Photography²²;
- Historic England Aerial Imagery²³;
- National Library of Scotland record of Historic OS maps²⁴;
- Ordnance Survey (OS) maps²⁵;
- Rivers Trust River barriers mapping²⁶; and

18 Environment Agency. (Online) Catchment data explorer. Available at: <https://environment.data.gov.uk/catchment-planning/> (Accessed 27 August).

19 Defra. (Online) Magic Map. Available at: <https://magic.defra.gov.uk/MagicMap.aspx> (Accessed 27 August 2024).

20 Environment Agency. (Online) Ecology and Fish Data Explorer. (Online) Available at: <https://environment.data.gov.uk/ecology/explorer/> (Accessed 27 August 2024).

21 UK Government (2022). North West river basin district river basin management plan: updated 2022. (Online) Available at: [https://www.gov.uk/guidance/north-west-river-basin-district-river-basin-management-plan-updated-2022#:~:text=The%20North%20West%20river%20basin%20district%20\(%20RBD%20\)%20river%20basin%20management,these%20challenges%20can%20be%20managed](https://www.gov.uk/guidance/north-west-river-basin-district-river-basin-management-plan-updated-2022#:~:text=The%20North%20West%20river%20basin%20district%20(%20RBD%20)%20river%20basin%20management,these%20challenges%20can%20be%20managed) (Accessed 27 August 2024).

22 Google (2024). Google Earth. (Online) Available at: <https://earth.google.com/web/> (Accessed 27 August 2024).

23 Historic England (2024). Aerial photo explorer. (Online) <https://historicengland.org.uk/images-books/archive/collections/aerial-photos/> (Accessed 27 August 2024).

24 National Library of Scotland. (Online). Available at: <https://maps.nls.uk/geo/explore/side-by-side/> (Accessed 27 August 2024).

25 Microsoft (2024). Bing maps. Images courtesy of OS. (Online) Available at: <https://www.bing.com/maps> (Accessed 27 August 2024).

26 Rivers Trust. (Online) River obstacles. Available at: <https://river-obstacles-theriverstrust.hub.arcgis.com/> (Accessed 27 August 2024).

- Natural England Priority Habitat mapping²⁷.

2.2 Field survey

Hydromorphology surveys

- 2.2.1 A survey of 13 watercourse crossings was undertaken by two WSP hydromorphologists between 07 and 11 August 2023, following a desk study, which was used to determine the most natural and hydromorphologically diverse watercourses. The aim of this desk assessment and specific field survey is to designate each Environment Agency main river a geomorphological conservation value, with higher values designated for more naturally performing watercourses. Notes and photographs compiled during the field survey were recorded using ESRI FieldMaps²⁸, and have been used to inform the assessment.
- 2.2.2 Full details of the hydromorphology desk based assessment and field surveys, alongside results from both of these assessments, are provided in **Appendix 7C: Hydromorphology Desk Based Study and Site Survey**.
- 2.2.3 A number of aquatic ecology surveys were also undertaken, including drone surveys and River Condition Assessments of proposed watercourse crossing locations along with Freshwater fish, macrophytes and macroinvertebrates surveys. The data gathered from these surveys has been utilised to provide additional baseline context. Full details can be found within **Appendix 5K: Aquatic Ecology Survey Report**.

Aquatic ecology

- 2.2.4 Full details of the aquatic ecology surveys undertaken along with a summary of the key identified receptors is included within **Appendix 5K: Aquatic Ecology Survey Report**.
- 2.2.5 Information on the aquatic ecology baseline, including the presence of migratory fish and eels, is presented within **Chapter 5: Biodiversity**.

27 Natural England. (Online) Priority Habitats Inventory (England). Available at: <https://naturalengland-defra.opendata.arcgis.com/datasets/Defra::priority-habitats-inventory-england/about> (Accessed 27 August 2024).

28 ESRI (Online). ArcGIS Field Maps. Available at: <https://www.esri.com/en-us/arcgis/products/arcgis-field-maps/overview?srsId=AfmBOoqLRIWtaD153MLuMJ9kTKMGEiFU6f7emt39MOt1c68AtlxvBONN> (Accessed 29 August 2024).

3. WFD Assessment Methodology

3.1 Structure of this Assessment

3.1.1 All aspects of construction, operation/maintenance and decommissioning of the Project have been considered in the assessment to determine whether each will have an impact on the WFD water bodies. Accordingly, the WFD compliance assessment considers the following key questions:

- At the waterbody scale, on a non-temporary basis, will the Project result in deterioration of any of the WFD classification elements from one status class to the next, (e.g. from Good to Moderate) irrespective of whether or not it results in the lowering of overall status?
- Will the Project prevent any water bodies from achieving Good overall status in the future?
- Will the Project contribute towards a cumulative deterioration of WFD status (in combination with other projects) or prevent the cumulative enhancement of status (up to 2027)?
- Will the Project compromise the achievement of the WFD objectives in multiple water bodies that are hydrologically linked?
- Can the Project assist in the delivery of any measures, as published in the RBMP, required to achieve waterbody objectives?

3.2 Available Guidance

3.2.1 This WFD compliance assessment has been undertaken in line with guidance within Planning Inspectorate's Advice Note Eighteen: the Water Framework Directive (The Planning Inspectorate, 2017¹). In this Advice Note, the Inspectorate supports the preparation and submission of separate WFD assessment reports by Applicants, which clearly explain how the requirements of WFD have been met. The Guidance informs applicants of the requirements of the WFD and 2017 Regulations⁴, as applicable to NSIPs under the Planning Act 2008²⁹³⁰. It explains the information that the Inspectorate considers an Applicant must provide with their NSIP application to demonstrate that the WFD and the 2017 Regulations have been appropriately considered.

29 UK Government, (2008) Planning Act 2008. (Online). Available at:

<https://www.legislation.gov.uk/ukpga/2008/29/contents> (Accessed 19 July 2024)

30 Applicants will need to clearly identify in their documentation (either within the ES or as a standalone document(s)) the implications of the Project for the objectives of the WFD and relevant RBMPs. While it is most likely that the WFD assessments will utilise information gathered as part of the wider EIA, this must be transposed into an assessment in the context of WFD and ultimately it must be determined if the Project has the potential to impact upon WFD water bodies.

- 3.2.2 The principal source of relevant guidance on WFD compliance assessment in England is the Environment Agency. At present the only publicly available guidance is Environment Agency (2023) *Water Framework Directive assessment: estuarine and coastal waters*, referred to as ‘*Clearing the Waters for All*’³¹, which relates specifically to activities in estuarine and coastal water bodies up to one nautical mile out to sea. This guidance interprets the ‘no deterioration criterion’ as applying to each supporting WFD element as well as the overall status classification of the waterbody. This is supported by the ‘Bund Case’³² which ruled (at a European level) that this was true for all WFD water bodies. So, for example, a deterioration in the quality of macrophytes in a river waterbody from good to moderate status would be classed as deterioration irrespective of whether this caused the overall waterbody status to be lowered.
- 3.2.3 Furthermore, the Cycle 3 RBMPs indicate that within-class deterioration of any constituent element (e.g. a lowering of the quality of macrophytes in a river waterbody that does not result in a lowering of the status of macrophytes e.g. from Good to Moderate) is permissible but should be limited as far as practicable. There are two exceptions to this: first, where the waterbody is at the lowest possible class (Bad Ecological Status/Potential) where no within-class deterioration is allowed and, second, elements that are at High Status (with the exception of morphology), which may be allowed to deteriorate to Good Status provided a number of additional conditions are met.
- 3.2.4 From an overall WFD compliance perspective, the principles set out in *Clearing the Waters for All*³¹ are unlikely to change. The Environment Agency has also made available its position statement on WFD assessment of new physical works in rivers (position 488_10)³³ which has been used, as appropriate, to assess effects on river water bodies.
- 3.2.5 The Environment Agency has not published any guidance on WFD compliance assessments of lake or groundwater bodies, or non-reportable water bodies.

3.3 Assessment Process

- 3.3.1 The WFD compliance assessment considers the potential for both short-term and long-term impacts on WFD water bodies, which have a hydrological or groundwater connection to the Project.
- 3.3.2 The WFD compliance assessment has been based on the approach set out in Planning Inspectorate’s Advice Note Eighteen: The Water Framework Directive (The Planning Inspectorate, 2017¹) and comprises the following stages:

31 Environment Agency (2023). *Water Framework Directive assessment: estuarine and coastal waters*. (Online). Available at <https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters> (Accessed 27 August 2024)

32 Paloniitty, Tiina (2016). The Weser Case: Case C-461/13 Bund V Germany. *Journal of Environmental Law*, Volume 28, Issue 1, March 2016, Pages 151–158.

33 Environment Agency (2010). Document 488-10 Assessing new modifications for compliance with WFD.

- **Stage 1: Screening;** Screening is required to identify activities which have the potential to result in deterioration of a waterbody or fail to comply with the objectives of that waterbody. Screening also serves to identify those proposed activities (e.g. proposed construction methods) that are required to be taken through to scoping, and those activities that are unlikely to result in the deterioration of the waterbody.
- **Stage 2: Scoping;** Scoping is required to identify risks to receptors from a project's activities, based on the relevant water bodies and their water quality elements (including information on status, objectives, and the parameters for each waterbody). Potential risks to hydromorphology, biology (habitats and fish), water quality, WFD protected areas and invasive non-native species should be assessed. The scoping stage identifies which elements need to be carried forward to Stage 3.
- **Stage 3: Further assessment, if required;** Where assessment has been considered necessary at scoping stage, an impact assessment is carried out for each receptor identified as being at risk in terms of potential deterioration or non-compliance with its specific objectives as set out in the River Basin Management Plan as a result of the project. Where the potential for deterioration of water bodies is identified, and it is not possible to mitigate the impacts to a level where deterioration can be avoided, the project would need to be assessed in the context of Article 4(7) of the WFD. Whilst the assessment of potential construction impacts is not required as part of a WFD compliance assessment, these impacts may have detrimental impacts on the WFD quality elements and construction periods may sometimes be of long duration (i.e. several years). Thus, construction impacts are considered, along with mitigation to reduce or eliminate potential impacts on the waterbody and WFD quality elements.
- **Stage 4: Conclusions;** presents an assessment of the risk of deterioration of the Status/Potential of all screened-in WFD waterbodies and whether the Project will enhance or positively contribute to WFD waterbody objectives, the potential for the Project to lead to a deterioration in WFD status and any Article 4(7) Considerations and a statement of WFD compliance.

3.3.3 For transitional water bodies, the WFD methodology adopts the process set out in the Clearing the Waters for All³¹ guidance. This guidance sets out three stages for the WFD assessment process for transitional waters, and the outcome of each stage determines whether the assessment needs to progress to the next stage. The three stages are:

- **Stage 1 Screening** – this stage excludes any activities that do not need to go through the scoping or impact assessment stages.
- **Stage 2 Scoping** – identifies the receptors that are potentially at risk from the Proposed Works, which need impact assessment. Potential risks to hydromorphology, biology (habitats and fish), water quality, WFD protected areas and invasive non-native species ('INNS') should be assessed. These are then considered against specific criteria provided by the Environment Agency by means of the recommended scoping template.

- **Stage 3 Impact assessment** – considers the potential impacts of the Proposed Works, identifies ways to avoid or minimise impacts, and determines whether the Proposed Works may cause deterioration or jeopardise the waterbody achieving Good status.

Given the similarity between the two sets of guidance for assessment, the process for screening, scoping and assessment has been followed for all WFD waterbodies, with transitional waterbodies being, scoped and assessed in line with the Cleaning the Waters for All Guidance. Conclusions are presented for all WFD waterbodies.

3.4 Limitations and Assumptions

- 3.4.1 At the request of the Environment Agency³⁴, non-reportable WFD bodies have been assessed as if they were at Good Status, as they do not have official WFD classifications and data is not routinely collected for these areas.
- 3.4.2 **Appendix 5K: Aquatic Ecology Survey Report** contains full details of the limitations and assumptions of the aquatic ecology surveys which have been used to inform this assessment.

³⁴ By Email, Environment Agency reference SO/2022/122353/03-L01, received 09/09/22

4. Screening Assessment

4.1 Introduction

- 4.1.1 The Screening Assessment aims to identify the project activities, which have the potential to affect WFD water bodies and those water bodies which could be affected.

4.2 Spatial Scope of the Assessment

- 4.2.1 The Draft Order Limits for the Project, as described in **Chapter 2: The Project**, is the area within which all project infrastructure and activities will be located and, therefore, where direct effects on the water environment arising from the Project may be expected to occur.
- 4.2.2 A wider Study Area has then been defined to include all WFD surface waterbody catchments intersected by the Draft Order Limits, as these are the water bodies which have the greatest potential to be affected by the Project. There are no WFD surface water bodies downstream of the Study Area. With regards to groundwater bodies, the Study Area has been deemed to be suitable based on professional judgement. Additionally, the localised and shallow nature of any works below the ground, and the full area of the WFD groundwater bodies, which intersect the Draft Order Limits are judged to be too extensive with there being no potential for effects in the wider area. This Study Area is used as the basis for both the EIA and WFD Compliance Assessments, as set out in **Section 7.4 of Chapter 7: Water Environment**.
- 4.2.3 All of the WFD water bodies within the Study Area are within the North West River Basin District as defined in the Cycle 3 North West River Basin District RMBP published in October 2022²¹.

4.3 Water Bodies

Overview

- 4.3.1 The WFD water bodies screened in for further assessment are outlined here, with full details of their WFD classification included within **Appendix 7B: Detailed water environment baseline information**.
- 4.3.2 The WFD water bodies are screened into the assessment on the basis that they have a potential hydrological or hydrogeological connection to the Project and therefore have the potential to be impacted. All other WFD water bodies not considered to not have a potential connection to the Project and have therefore been screened out of further assessment within **Chapter 7: Water Environment** on the basis that they are unlikely to be impacted. As there are no WFD water bodies downstream of the screened in water bodies, downstream impacts are not considered further. Screening of waterbodies has been undertaken prior to consideration of any embedded environmental measures. Although this

approach to assessment deviates from that adopted across the other Draft ES documents, this approach was agreed with Environment Agency for the WFD in a meeting on 13th June 2022 and has therefore been adopted in this assessment

- 4.3.3 A summary of the WFD water bodies which have been screened in for further assessment is provided below.
- 4.3.4 The baseline status/potential and objectives of the water bodies is included within **Appendix 7B: Detailed water environment baseline information** and summarised in **Section 6** of this Appendix.

River water bodies

- 4.3.5 There are 23 river WFD water bodies within the Study Area. Two river water bodies, Forge Brook and Dog Clog Brook, have been screened out of further assessment on the basis of having no direct hydrological connection to the Draft Order Limits.
- 4.3.6 Twenty-one river WFD water bodies have therefore been screened in for further assessment. Eight of these are designated as being HMWBs. All the WFD classification information on the screened-in river water bodies are listed in **Appendix 7B: Detailed water environment baseline information** and shown in **Figure 7.2**.
- 4.3.7 The screened in WFD river Waterbodies are:
- Sinderland Brook (GB112069060980);
 - Whittle Brook (Mersey Estuary) (GB112069060990);
 - Sutton Brook (GB112069061170);
 - Weaver (Dane to Frodsham) (GB112068060500);
 - Mersey/ Manchester Ship Canal (Irwell/Manchester Ship Canal to Bollin) (GB112069061011);
 - River Weaver (Barnet to Valley Brook) (GB112068060461);
 - River Weaver (Valley Brook to Winsford Flashes) (GB112068060462);
 - River Weaver (Winsford Flashes to Dane) (GB112068060463);
 - Bollin (Ashley Mill to Manchester Ship Canal) (GB112069061382);
 - Dane (Wheelock to Weaver) (GBGB112068060470);
 - Gale Brook (GB112068060430);
 - Puddinglake Brook (GB112068060220);
 - Bogart Brook (GB112068060540);
 - Cuddington Brook (Source to Crowton Brook) (GB112068060480);
 - Wade Brook (GB112068060370);

- Peckmill Brook, Hoolpool Gutter at Ince Marshes. Waterbody (GB112068060330);
- Arley Brook (Source to Gale Brook) (GB112068060420);
- Keckwick Brook (GB112068060520);
- Cogshall Brook (GB112068060510);
- Mersey (Bollin confluence to Howley Weir) including Padgate Brook (GB112069061012); and
- Hardshaw (Windle) Brook (GB112069061210).

Canal water bodies

4.3.8 There are five canal WFD water bodies within the Study Area, which all intersect the Draft Order Limits and have been screened in for further assessment. All the WFD classification information on the screened-in canal water bodies are listed in **Appendix 7B: Detailed water environment baseline information**. The location of the canal water bodies is shown in **Figure 7.2**.

4.3.9 The screened in canal waterbodies are:

- Weaver Navigation (canal section Frodsham to Weston Point Docks) (GB71210545);
- Bridgewater Canal (GB71210001);
- Manchester Ship Canal (GB71210004);
- Sankey Canal (GB71210055); and
- Trent and Mersey Canal, summit to Preston Brook Tunnel (GB71210247).

Transitional water bodies

4.3.10 The Mersey (GB531206908100) is the only transitional WFD waterbody within the Study Area and it is intersected by the Draft Order Limits. It has been screened in for further assessment and its location is shown in **Figure 7.2**.

Lake water bodies

4.3.11 While there are three Lake WFD water bodies present within the Study Area, all three have been screened out of further assessment on the basis that the lakes are located upstream of the Draft Order Limits and are not considered likely to be impacted. Lake WFD water bodies are therefore not considered further.

Non reportable water bodies

4.3.12 Within the Study Area, there is a 136.6km² area of land which is not classified as a WFD waterbody of any kind under the Cycle 3 WFD classifications. This area is referred to as a non-reportable waterbody by the Environment Agency. While this area is not reportable under the WFD, it is still legally protected from pollution, modification and abstraction.

- 4.3.13 The areas of non-reportable waterbody that is considered within this assessment are outlined in **Figure 7.2**.

Groundwater bodies

- 4.3.14 There are five WFD groundwater bodies which intersect the Study Area. They have all been screened in for further assessment and they are shown on **Figure 7.5**.
- 4.3.15 The screened in WFD Groundwater bodies are -
- Wirral and West Cheshire Permo-Triassic Sandstone Aquifers (GB41101G202600);
 - Weaver and Dane Quaternary Sand and Gravel Aquifers (GB41202G991700);
 - Manchester and East Cheshire Permo-Triassic Sandstone Aquifers (GB41201G101100);
 - Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers (GB41201G101700); and
 - Sankey and Glaze Carboniferous Aquifers (GB41202G100100).

4.4 Project Activities

Overview

- 4.4.1 A brief overview of the Project is provided here to describe the project activities pertinent to the water environment. Full details are provided in **Chapter 2: The Project**.
- 4.4.2 The Project includes the construction, operation and eventual decommissioning of approximately 100km of new pipeline to distribute hydrogen to industry in the North West. A number of Hydrogen Above Ground Installations (HAGIs), including Block Valve Installations (BVIs) are required to control the flow and pressure of hydrogen at key points along the proposed pipeline.
- 4.4.3 The Project connects the Hydrogen Production Plant (HPP) at the Stanlow site, as the source of hydrogen, for onward distribution to the network. The pipeline transports hydrogen to the Central Hub at the centre of the network, which then serves as the connection and onward distribution point to the North, East and South corridors, which would extend to St. Helens, Partington and Northwich respectively. Branching off from each main corridor would be pipeline spurs connecting hydrogen customers to the main pipeline. Infrastructure has also been included which supports the potential blending of hydrogen with methane in the existing gas network.
- 4.4.4 The presently anticipated maximum extent of land in which the Project may take place, which is assessed in this Draft ES, is defined by the 'Draft Order Limits', land within which is hereafter referred to as 'land within the Draft Order Limits'

- 4.4.5 A proportionate degree of flexibility has been incorporated into the Project design so that unforeseen issues that may be encountered following consent can be sufficiently mitigated. For example, previously unidentified poor ground conditions may require a pipeline section to be re-routed slightly for geotechnical reasons. Therefore, to allow for this, new infrastructure would be constructed within specified Limits of Deviation (LoD) which identify a maximum distance or measurement of variation within which the works must be constructed; further detail is provided on LoD in **Chapter 2: The Project**
- 4.4.6 Construction is expected to commence in Q1 2027 ready for commissioning Q1 2030. The Project would be operational by Q2 2030.
- 4.4.7 Further details as to the project activities are presented below which have been used in the screening process to justify screening them in or out of further assessment.

Pipeline corridor laying

Construction site preparation

- 4.4.8 Once access is achieved from the highway, the access track will be based on the particular terrain conditions on the access route. This would vary from stripping the topsoil to allow vehicles to run on the subsoil, limited grading (if required), and use of track mats or overlaying crushed stone on a geotextile membrane (floating roads).
- 4.4.9 Site clearance including hedgerow and tree removal (outside the bird nesting season) and localised re-grading would take place. The requirements for clearance would be location-specific but during the development of the Project a key consideration would be to retain and protect sensitive areas, including habitats and vegetation, where practicable
- 4.4.10 Earthworks would be limited due to the general gentle undulation of the terrain within the Study Area. Some ground levelling or cut and fill works may be required on a limited number of steep slopes or banks. Benching (terracing) may be required in a small number of locations where side slopes exist.
- 4.4.11 All suitable excavated materials would be reused in reinstatement and restoration of ground levels.
- 4.4.12 Topsoil would be stripped across the required working area and stored at the edge of the works in accordance with industry best practice, to protect topsoil integrity for future reuse during reinstatement.

Pipe diameters and working widths

- 4.4.13 The pipes will vary in diameter between approximately 6" and 42" dependent on which corridor or spur they are on. The diameters of the pipes will influence the construction working widths (see **Table 7E.2** below), for example, for a 42" pipeline the working width would be expected to be up to 36m. The working width is divided into work, transport and laydown areas. It typically comprises topsoil and subsoil laydown areas, the trench area, pipe string and construction

equipment area and a running track for through access of construction related personnel.

Table 7E.2 Pipeline diameters and typical construction working widths.

Pipeline diameter range (inches)	Typical construction working widths (m)
36 – 42"	36
24 – 30"	28
16 – 20"	22
4 - 14"	Within Highway boundary*

** Note: Exceptions to this are the West and North Corridor spurs, which vary from 8-10" diameter pipeline and would generally use the working width applicable for 16-20" if routed cross country*

Fabrication

- 4.4.14 Line pipes would be brought to site and stored in stacks prior to deployment along the pipeline route, before being transported to their final location along the route, where they would be placed on wooden supports or skids adjacent to the line of the trench. This process is known as pipe stringing.

Trenching

- 4.4.15 The pipe trench would generally be dug using mechanical excavators or trenching machines, which would normally straddle the trench. The depth and width would vary with pipeline diameter but would allow a minimum reinstated cover of 1.2m over the top of the pipeline. The subsoil material excavated would be stored separately from the topsoil to avoid mixing.
- 4.4.16 Dewatering of trenches may be required (e.g., in the event that groundwater is present). Groundwater monitoring is to take place as part of the ground investigation works pre construction. The method of dewatering will be dependent on the ground conditions, however it is likely to include the use of mobile pumps.

Pipe laying

- 4.4.17 Welded pipe sections would be carefully lifted and lowered into the trench in a continuous operation using side booms, excavators or cranes dependent on the size of the pipeline. Backfilling would be undertaken using subsoil from the temporary storage areas.

Reinstatement

- 4.4.18 Reinstatement of the working area would be undertaken typically including regrading, subsoil ripping to relieve compaction and removal of debris. Topsoil would be reinstated to the former depth.
- 4.4.19 Where possible, previous land uses would be re-established e.g., agricultural areas and fencing established in accordance with agreements with landowners and in consideration of the necessary easements. Areas of landscaping and required habitat reinstatement, including tree and hedgerow planting, would be implemented through a landscaping scheme that would be prepared and delivered in accordance with a requirement of the DCO.
- 4.4.20 Drainage altered during construction would be reinstated and where necessary, new drainage would be laid. All temporary materials such as bog mats, road fill, temporary culverts and geotextile membrane will be removed during the reinstatement works.

Hydrostatic Pressure Testing

- 4.4.21 Hydrostatic pressure testing will be carried out using a local water source (as agreed by the Environment Agency and local authority). The contractor is to determine the water sources and evaluate the need for water treatment for the hydrotest. The reuse of water is to be maximised. Sections of the pipeline will be tested sequentially along the Right of Way as construction advances.
- 4.4.22 The water used for the hydrotest may be transferred to another section of the pipeline for testing or may be discharged. Water analysis will be carried out and permission from the appropriate water authority will be given before water is returned to any waterbody. Discharge will require scour control at the discharge point, oxygen levels will be monitored in dissolved water, chemical concentrations will be monitored before the final discharge, effluent will be continuously sampled and discharge rates, volumes and times will be logged.
- 4.4.23 Regulatory requirements for water abstraction will be adhered to. An environmental discharge permit will be required to control any additional nutrients/ physio-chemical elements/ contaminants to the watercourse. The permit/ licensing arrangements will take into account changes in the flow regimes from discharge and abstraction input and changes to channel morphology.

Open-cut/trenched watercourse crossings

- 4.4.24 Open-cut installation involves the excavation of a trench across the feature to be crossed and the installation of the pipeline in the trench. A trench for the largest diameter pipe may be approximately 2.5m deep while crossings of features such as streams may require excavations of approximately 4m – 5m deep. This method is typically used for minor roads, tracks, streams and ditches.
- 4.4.25 Open-cut installation of watercourses would typically be undertaken by one of two methods, either by fluming or damming subject to the required consents. Although, a combination of pumping for flow transfer and fluming may also be used.

4.4.26 Fluming would typically include the following stages:

- Steel or plastic pipe is installed along the bed such that the water flows unimpeded through the flume. These would be sized to ensure that the total flow capacity includes any anticipated increase in flow due to wet weather plus a factor of safety;
- Excavation of a trench beneath the flume and the pipeline inserted beneath;
- Backfilling of the trench and removal of the temporary flume; and
- Reinstatement of the feature crossed to pre-construction condition.

4.4.27 Damming would typically include the following stages:

- Damming at the proposed crossing location through installation of steel trench sheets, aggregate/sand bags or similar;
- Transfer of flowing water from upstream to downstream using pumps and hoses. Pumps and hoses would be suitably sized to ensure that the total flow capacity includes anticipated increase in flow due to wet weather plus a factor of safety. Note, this may not be necessary in drainage ditches where water flows in either direction;
- Excavation of the trench through the temporarily dammed area and installation of the pipeline;
- Backfilling of the trench and removal of the temporary dam; and
- Reinstatement of the feature crossed to pre-construction condition.

4.4.28 To maintain access to either side of these features, temporary crossing points would be required subject to agreement with the appropriate authorities. This would typically include bridging where larger spans are required or fluming for smaller features. Bridging would typically be used on features including rivers, larger streams/ ditches (note, this is for access only and the pipeline may still be installed using a trenchless crossing method). Bridging of navigable canals is not proposed.

4.4.29 For flumed temporary crossing points, these would include sizing and laying of a steel or plastic pipe as described above. To complete the installation of the crossing, a combination of geotextile and fill (e.g., stone, excavated materials) and/or bog mats would provide the surface for plant and vehicles to move over. At the end of construction, the materials and pipe would be removed and reinstatement undertaken to pre-construction condition.

Trenchless Watercourse Crossings

4.4.30 Where feasible, trenchless crossings have been selected on larger or more sensitive rivers to reduce the potential for deterioration. The information on which crossings are to be trenchless and which are to be open-cut watercourse crossing scheduled is included within **Annex A - Watercourse crossings with WFD hydromorphology designations of Appendix 7C Hydromorphology desk based study and site survey**.

- 4.4.31 While there are multiple methods of trenchless crossing, each trenchless crossing technique is characterised by the need for establishment of an entry and exit site to allow for the pipeline to be laid under the watercourse without the flow of water being affected as there are no in-channel works. This approach therefore limits the impacts on hydromorphology and ecological WFD classifications.
- 4.4.32 Temporary construction compounds at crossings include areas for pit / shaft construction, excavated materials, soil processing plant, settlement pits (as required), drilling mud/ slurry processing. Storage of materials and equipment, drilling rigs and ancillary equipment, generators, security and welfare facilities, temporary office, car parking, fuelling area, waste disposal etc would also be required.
- 4.4.33 The length of time a trenchless crossing site would be in use varies depending on the technique, complexity, depth and length of crossing. This may vary between one to six months. Some continuous (24 hour) working will be required.
- 4.4.34 There are three types of trenchless crossing techniques which will be utilised on the Project. They are:

Horizontal Directional Drilling

- 4.4.35 Horizontal Directional Drilling (HDD) requires creation of an entry and exit pit on either side of the feature to be crossed and guiding a pilot hole along a pre-determined profile beneath the obstacle. For further detail please refer to **Chapter 2: The Project**.

Auger Boring

- 4.4.36 Auger bores are typically used for shorter trenchless crossings. The auger bore process requires the establishment of a drive reception pit and boring the hole under the watercourse to be crossed.

Mirco-tunnelling

- 4.4.37 Micro-tunnelling can be used for short and longer crossings but generally requires a larger footprint including installation of drive and reception pits or shafts.

Temporary access tracks

- 4.4.38 In order to support construction activities, temporary access tracks will be required from the highway network to the construction locations.
- 4.4.39 Once access is achieved from the highway, the access track would be based on the particular terrain conditions on the access route. This would vary from stripping the topsoil to allow vehicles to run on the subsoil, limited grading (if required), and use of track mats or overlaying crushed stone on a geotextile membrane (floating roads).
- 4.4.40 It is envisaged that running track access stabilisation will be required in areas that are soft, wet, boggy and in peat areas (if necessary). Stable accesses will be

made either by use of installed track matting, floating road or with use of imported aggregates if it is anticipated to be located in wet / boggy areas and at some temporary access locations. Track matting and floating roads are typically placed directly over topsoil to avoid stripping or may be used directly on subsoil following stripping if topsoil is unstable. The exact stabilisation method would be determined, as required, based on location specific soil conditions identified by pre-construction intrusive ground investigation.

- 4.4.41 Following construction, the access tracks will be reinstated in accordance with the landscape scheme which would be defined in the decommissioning plan.

Temporary Construction Compounds

- 4.4.42 Temporary construction compounds would be established to support the construction of the pipeline and HAGIs.
- 4.4.43 All temporary construction compounds will have a temporary drainage system installed that will prevent any construction waste or pollution from entering watercourses or the mains sewerage system. Locations at high risk of chemical spillage will have dedicated bund systems put in place, where the spillage will be drained to a suitable containment vessel and treated offsite.
- 4.4.44 The typical site construction sequence would include:
- Site preparation, including typical activities for pipeline construction described above;
 - Earthworks and civils, including the establishment of concrete bases for permanent equipment; and
 - Installation of mechanical equipment and laying and connection of pipes.

Permanent above ground infrastructure

- 4.4.45 It is currently envisaged that nine HAGIs and two Block Valve Installations (BVIs) would be required at key points along the network. HAGI sites will include a range of permanent above ground components for which further description is provided under the headings below. This infrastructure would typically be approximately up to 3m in height, subject to final design. Other features including fencing, general telecommunications equipment and lighting may vary. HAGI sites footprint would vary; typically ranging between 0.5ha to 1.5ha.

Maintenance

- 4.4.46 The frequency of periodic maintenance undertaken on-site has yet to be determined but would typically include the following for telemetered sites:
- Planned periods of maintenance every 6 months with a duration of up to 2 days;
 - Pipeline inspection operations requiring ten personnel for approximately one week and undertaken every 1 to 5 years, subject to further development for hydrogen pipelines. Inspection operations involve an internal examination of

the pipe undertaken by a “pig”, an inline inspection tool, which travels inside the pipeline from one HAGI to the next; and

- Infrequent breakdown or urgent visits with access on a 24/7 basis if required.

4.4.47 Pipeline surveillance is undertaken from the air so access onto private land is not normally required. Aerial surveys are typically undertaken every two weeks, but frequency will be determined during further design development and engagement with the Health and Safety Executive. There are some infrequent maintenance surveys (every 2 to 7 years) which may be required and would require access on foot (line walking) over the route of the pipeline, but do not require excavation or other intrusive activities.

4.4.48 As described above, the inspection of the pipelines is undertaken internally from the inspection facilities at HAGIs with limited access to the buried pipeline route. It is anticipated that no pipeline maintenance would be required where excavation of the pipeline is required unless a defect is identified. If a defect is found this would be assessed against standard Cadent management procedures.

4.5 Screening

4.5.1 As the Project is a linear infrastructure project, the construction methods will predominantly be consistent along the length of the pipeline route. project activities which will be repeated multiple times have therefore been considered as single groups of activities for the purposes of screening.

4.5.2 **Table 7E.3** summarises the project activities (with a full description provided in **Chapter 2: The Project**) and determines whether they are screened in or out of further assessment. The screening of project activities has been undertaken without any consideration of any embedded environmental measures.

Table 7E.3 Screening assessment of project activities

Activity / Infrastructure	Element of construction /maintenance of interest to the WFD	Screened in or out of further assessment	WFD Waterbodies where Project activities occur
Pipeline corridor laying	• Soil stripping • Trenching • Fabrication • Pipe laying • Disposal of test water (in accordance with permit) • Reinstatement	Screened in due to the potential for pollutants to be released during construction, the potential for excavations to affect surface water flow paths and groundwater quantity.	River – All riverine waterbodies listed in Appendix 7B: Detailed water environment baseline information – Table 7.1 Canal – None Transitional – None Groundwater – • Wirral and West Cheshire Permo-Triassic Sandstone Aquifers (GB41101G202600) • Weaver and Dane Quaternary Sand and Gravel Aquifers (GB41202G991700) • Manchester and East Cheshire Permo-Triassic Sandstone Aquifers (GB41201G101100) • Lower Mersey Basin and North Merseyside Permo-Triassic

Activity / Infrastructure	Element of construction /maintenance of interest to the WFD	Screened in or out of further assessment	WFD Waterbodies where Project activities occur
			Sandstone Aquifers (GB41201G101700) Sankey and Glaze Carboniferous Aquifers (GB41202G100100) Non-reportable - All areas of non-reportable waterbodies within the Study Area
Hydrostatic testing	- Hydrostatic testing – (cleaned using pigging equipment and hydrostatically pressure tested) - Abstraction of water for use in testing - Discharge of water following testing	Screened in due to the potential for hydrology, water quality and ecology to be impacted.	River – - Weaver (Dane to Frodsham) (GB 112068060500) - River Weaver (Winsford Flashes to Dane) (GB112068060463) - Canal - Bridgewater Canal (GB71210001) - Weaver Navigation (canal section Frodsham to Weston Point Docks) (GB71210545) Transitional – Mersey (GB531206908100) Groundwater – None Non-reportable –

Activity / Infrastructure	Element of construction /maintenance of interest to the WFD	Screened in or out of further assessment	WFD Waterbodies where Project activities occur
			All areas of non-reportable waterbodies within the Study Area
Pipeline corridor watercourse crossings – Open-cut	• Trenching • Fluming • Damming • Reinstatement	Screened in due to the potential for hydromorphology, ecological continuity, water quantity and quality to be impacted.	River – Open cut crossings are proposed within all WFD River waterbodies listed Appendix 7B: Detailed water environment baseline information – Table 7.1. In most cases these will be on minor watercourses within the WFD waterbody catchment area. However, Puddinglake Brook and Hornsmill Brook are WFD rivers which will be crossed by open-cut. Canal – None Transitional – None Ground – Wirral and West Cheshire Permo-Triassic Sandstone Aquifers (GB41101G202600) Weaver and Dane Quaternary Sand and Gravel Aquifers (GB41202G991700) Manchester and East Cheshire Permo-Triassic Sandstone Aquifers (GB41201G101100)

Activity / Infrastructure	Element of construction /maintenance of interest to the WFD	Screened in or out of further assessment	WFD Waterbodies where Project activities occur
			Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers (GB41201G101700) Sankey and Glaze Carboniferous Aquifers (GB41202G100100) Non-reportable – All areas of non-reportable waterbodies within the Study Area
Pipeline corridor watercourse crossings – Trenchless	• HDD • Auger boring • Micro-tunnelling	Screened in due to the potential for water quantity and quality and ecological receptors to be impacted.	River – Trenchless crossings are proposed for watercourses within all River WFD catchments within Appendix 7B: Detailed water environment baseline information – Table 7.1 Canal – Weaver Navigation (canal section Frodsham to Weston Point Docks) (GB71210545), Bridgewater Canal (GB71210001) Manchester Ship Canal (GB71210004) Sankey Canal (GB71210055) Trent and Mersey Canal, summit to Preston Brook Tunnel(GB71210247) Transitional –

Activity / Infrastructure	Element of construction /maintenance of interest to the WFD	Screened in or out of further assessment	WFD Waterbodies where Project activities occur
			Mersey (GB531206908100) Groundwater – Wirral and West Cheshire Permo-Triassic Sandstone Aquifers (GB41101G202600) Weaver and Dane Quaternary Sand and Gravel Aquifers (GB41202G991700) Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers (GB41201G101700) Non-reportable – All areas of non-reportable waterbodies within the Study Area
Temporary access tracks	Construction and use of temporary access tracks at associated watercourse crossings	Screened in due to the potential for hydromorphology, ecological continuity, water quantity and quality to be impacted.	River – Temporary access tracks are proposed within all River WFD catchments listed in Appendix 7B: Detailed water environment baseline information – Table 7.1 Canal – None Transitional – None

Activity / Infrastructure	Element of construction /maintenance of interest to the WFD	Screened in or out of further assessment	WFD Waterbodies where Project activities occur
			Groundwater – Wirral and West Cheshire Permo-Triassic Sandstone Aquifers (GB41101G202600) Weaver and Dane Quaternary Sand and Gravel Aquifers (GB41202G991700) Manchester and East Cheshire Permo-Triassic Sandstone Aquifers (GB41201G101100) Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers (GB41201G101700) Sankey and Glaze Carboniferous Aquifers (GB41202G100100) Non-reportable – All areas of non-reportable waterbodies within the Study Area
Temporary construction compounds	Construction and use of temporary construction compounds and associated drainage³⁵	Screened in due to Potential impacts on water quality and quantity.	River – Temporary construction compounds are proposed within all River WFD waterbody catchments listed in Appendix 7B: Detailed water environment baseline information – Table 7.1

³⁵ Temporary construction compounds include: trenchless crossing compounds, HAGI compounds, BVI compounds, pipe dump locations.

Activity / Infrastructure	Element of construction /maintenance of interest to the WFD	Screened in or out of further assessment	WFD Waterbodies where Project activities occur
			Canal – Weaver Navigation (canal section Frodsham to Weston Point Docks) (GB71210545), Bridgewater Canal (GB71210001) Manchester Ship Canal (GB71210004) Sankey Canal (GB71210055) Trent and Mersey Canal, summit to Preston Brook Tunnel (GB71210247) Transitional – None Groundwater – Wirral and West Cheshire Permo-Triassic Sandstone Aquifers (GB41101G202600) Weaver and Dane Quaternary Sand and Gravel Aquifers (GB41202G991700) Manchester and East Cheshire Permo- Triassic Sandstone Aquifers (GB41201G101100) Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers (GB41201G101700) Sankey and Glaze Carboniferous Aquifers (GB41202G100100)

Activity / Infrastructure	Element of construction /maintenance of interest to the WFD	Screened in or out of further assessment	WFD Waterbodies where Project activities occur
			Non-reportable – All areas of non-reportable waterbodies within the Study Area
Permanent above ground infrastructure (construction)	• Up to 9 HAGIs • 2 BVIs	Screened in due to the potential for water quality and quantity to be impacted.	River – Sinderland Brook (GB112069060980), Whittle Brook (Mersey Estuary) (GB112069060990) Weaver (Dane to Frodsham) (GB112068060500) Mersey/ Manchester Ship Canal (Irwell/Manchester Ship Canal to Bollin) (GB112069061011) River Weaver (Barnet to Valley Brook) (GB112068060461) River Weaver (Valley Brook to Winsford Flashes) (GB112068060462) Puddinglake Brook (GB112068060220) Cuddington Brook (Source to Crowton Brook) (GB112068060480) Cogshall Brook (GB112068060510) Gale Brook (GB112068060430) Canal – Manchester Ship Canal (GB71210004) Transitional – None

Activity / Infrastructure	Element of construction /maintenance of interest to the WFD	Screened in or out of further assessment	WFD Waterbodies where Project activities occur
			Groundwater – Wirral and West Cheshire Permo-Triassic Sandstone Aquifers (GB41101G202600) Weaver and Dane Quaternary Sand and Gravel Aquifers (GB41202G991700) Manchester and East Cheshire Permo-Triassic Sandstone Aquifers (GB41201G101100) Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers (GB41201G101700) Sankey and Glaze Carboniferous Aquifers (GB41202G100100) Non-reportable – All areas of non-reportable waterbodies within the Study Area
Operation and maintenance	<u>Operation</u> • Presence of buried pipeline and above-ground infrastructure <u>Maintenance</u> • Planned periods of maintenance every 6 months with a duration of up to 2 days.	Screened out Operation of the pipeline would be below ground with no interaction with surface water features and there being no proposed activities which are	N/A

Activity / Infrastructure	Element of construction /maintenance of interest to the WFD	Screened in or out of further assessment	WFD Waterbodies where Project activities occur
	• Pipeline inspection operations requiring ten personnel for approximately one week and undertaken every 1 to 5 years including an internal examination of the pipe undertaken by a “pig”, an inline inspection tool, which travels inside the pipeline from one HAGI to the next. • Aerial surveys to be typically undertaken every two weeks. • Infrequent maintenance surveys (every 2 to 7 years). • Infrequent breakdown or emergency visits with access on a 24/7 basis if required.	considered likely to affect any aspect of WFD Status.	

Decommissioning Phase

- 4.5.3 Proposals for decommissioning of the Project at the end of its operating life are described in **Section 2.7 of Chapter 2: The Project**. In summary, it is likely that the buried pipeline would be left in-situ to avoid any environmental effects associated with its removal, but that sections at crossings (including watercourses) would be grouted. At HAGIs and BVIs, all above-ground infrastructure would be removed, residual subsurface pipework would be capped, backfilled and the surface restored or prepared for redevelopment.
- 4.5.4 The design life of the pipeline and HAGIs is anticipated as 40 years. It is reasonably expected that a statutory framework will be developed and agreed prior to any decommissioning. Similarly, future technology and good practice would develop and provide for new ways to undertake the process. A Decommissioning Plan will be developed by the undertaker in accordance with the strategy outlined within **Section 2.7 of Chapter 2: The Project**.
- 4.5.5 It is envisaged that HAGIs and BVIs would be removed by reversing the methods used for installation, with similar levels and types of equipment involved. Temporary decommissioning accesses may be required alongside compounds for the storage of equipment. HAGIs would be disconnected from the local electrical distribution and telecommunication systems, following which all electrical components would be removed. At this point, the site buildings and mechanical equipment would be dismantled, disconnected and removed from the HAGI site. For HAGIs and BVIs, pipework would be removed to surface where it would be backfilled and capped.
- 4.5.6 It is envisaged that rail, road and watercourse crossings would be backfilled with grout, if stabilisation is required, and left in situ. The land above would be reinstated to pre-construction/decommissioning conditions.
- 4.5.7 As such, decommissioning effects are **screened out** of further assessment at this time. However, these would need to be subject to full assessment at the appropriate time, when detailed proposals are put forward, and according to the baseline and regulatory context prevailing at that time of decommissioning works.

5. Scoping

- 5.1.1 The scoping assessment involves undertaking an initial assessment to identify the risks from the project activities, which have been screened in against the screened in WFD water bodies.
- 5.1.2 **Table 7E.4** considers the project activities and scopes in or out the WFD water bodies for further assessment based on the potential for the proposed activity to affect any aspect of WFD classification. Scoping has been undertaken without a consideration of any embedded environmental measures. Although this approach to assessment deviates from that adopted across the other Draft ES documents, this approach was agreed with Environment Agency for the WFD in a meeting on 13th June 2022 and has therefore been adopted in this assessment.
- 5.1.3 As the construction methods for the project activities will be consistent along the length of the pipeline, the activities continue to be considered as groups, rather than each individual occurrence of each activity. Similarly, the WFD water bodies are considered as groups rather than individuals as the potential impacts of the project activities are considered to be consistent across the Draft Order Limits and therefore across the screened in WFD water bodies.
- 5.1.4 It should be noted that all construction activities will be temporary and of limited duration. In addition, construction will not be occurring along the whole Draft Order Limits at once, with only limited sections being worked on at any one time. As such the effects of construction should be viewed in this context.
- 5.1.5 The activities scoped out are covered in **Table 7E.4** below, with a summary provided here:
- There will be no open-cut watercourse crossings on canals or the Mersey Transitional waterbody and therefore these project activities are scoped out in relation to these WFD water bodies.
 - There will be no temporary access track crossings of canals or the Mersey Transitional waterbody and this activity is therefore scoped out.
 - There is no permanent above ground infrastructure proposed in the vicinity of the Mersey Transitional waterbody and therefore this activity is scoped out.
 - It is not predicted that effects on WFD groundwater bodies are not likely to be significant with regards to the temporary access tracks and permanent above ground infrastructure construction due to the superficial nature of the proposed works, their limited size and limited potential for dewatering. These activities are therefore scoped out.
- 5.1.6 The scoping of transitional and coastal water bodies uses the methodology provided by the Environment Agency Clearing the Waters for All³¹ guidance. The Mersey WFD waterbody is the only coastal or transitional waterbody screened into the assessment. For the Mersey WFD waterbody, the scoping results for hydromorphology are shown in **Table 7E.5**, for biological receptors in **Table 7E.6**, for water quality in **Table 7E.7** and for Protected Areas and Invasive Non-

native Species (INNS) in **Table 7E.8**. **Table 7E.9** shows which project activities are scoped in against the Mersey for further assessment on the basis of the outcome of **Table 7E.4** to **Table 7E.8**.

Table 7E.4 Scoping for further assessment – River, canal, non-reportable and groundwater WFD water bodies.

Development activity (during construction)	Aspects of relevance to the WFD	Water bodies - Scoped in/out	Justification
Pipeline corridor laying	Trenching (with potential dewatering), abstraction and discharge of test water.	River – In All waterbodies Canal – Out Non-reportable – In Groundwater – In All waterbodies	Potential for the following short-term, temporary and localised effects: • Pollutants and sediments ingress to watercourses via runoff from working areas. • Pollutant release and ground disturbance during trenching, including discharge of dewatered groundwater pumped from trenched excavations.
Hydrostatic testing	Abstraction of water for use in hydrostatic testing. Discharge of water into waterbodies following hydrostatic testing.	River – In Weaver (Dane to Frodsham) (GB 112068060500) River Weaver (Winsford Flashes to Dane) (GB112068060463) Canal – In Non-reportable – Out Groundwater – Out	Flow regimes, groundwater quantity, hydromorphological and ecological quality elements could be affected by the abstraction and discharge of water for hydrostatic testing. Abstracted water quality could be reduced in the pipeline and de-oxygenated. Abstraction of water could impact the flow regime and sediment transport local to the abstraction. Discharged water could result in increases in bed and bank erosion local to the abstraction. No hydrostatic testing water will be abstracted from or discharged into non-reportable waterbodies.

Development activity (during construction)	Aspects of relevance to the WFD	Water bodies - Scoped in/out	Justification
			Excavations to lay the pipeline will be open during testing such that any leaks / repairs highlighted as part of the testing procedure would be able to be quickly fixed before impacting on groundwater. No water is to be abstracted from or discharged to groundwater sources.
Pipeline corridor watercourse crossings – Open-cut	Damming, over pumping or fluming of ordinary watercourses.	River – In All waterbodies Canal – Out Non-reportable – In Groundwater – In All waterbodies	Potential for the following short-term, temporary and localised effects: • Pollutant and sediment ingress to watercourses via runoff from adjacent working areas. • Disruption of channel morphology, sediment continuity, hydraulic regime and continuity of aquatic habitat • Disturbance of bed and bank material • Creation of a pollution pathway through the construction of a trench across watercourses and through interactions between groundwater and surface waters in stretches losing flow to the ground. All canals will be crossed with trenchless methods and are therefore scoped out.
Pipeline corridor watercourse	Construction of trenchless crossing access pits	River – In All waterbodies	Potential for the following short-term, temporary and localised effects:

Development activity (during construction)	Aspects of relevance to the WFD	Water bodies - Scoped in/out	Justification
crossings – Trenchless	Tunnelling/boring/drilling below watercourses	Canal – In All waterbodies Non-reportable – In Groundwater – In All waterbodies	• New pollution pathways to groundwater via excavation of launch and reception pits. • Ingress of pollution to watercourses via dewatering discharges from tunnelling/drilling drive and reception pits. • Pollution of ground and surface water via ‘break-out’ of drilling fluid.
Temporary Access tracks	Track construction Temporary culverts Temporary bridges	River – In All waterbodies Canal – Out Non-reportable – In Groundwater – Out	Potential for the following short-term, temporary and localised effects: • Pollutant and sediment ingress to watercourses via runoff from tracks. • Disruption of channel morphology, hydraulic regime and continuity of aquatic habitat during culvert installation. • Disturbance of bed and bank material during culvert and/or bridge installation. • Change in watercourse hydraulic regime as a result of culvert or bridge presence. No temporary access tracks are proposed over canals. Effects on the groundwater bodies are not likely to be significant due to the shallow and superficial nature of the proposed temporary access tracks with no requirement for dewatering and the scale of activity relative to the groundwater waterbody scale.

Development activity (during construction)	Aspects of relevance to the WFD	Water bodies - Scoped in/out	Justification
Temporary construction compounds	Compound construction	River – In All waterbodies Canal – In All waterbodies Non-reportable – In Groundwater – Out	Potential for the following short-term, temporary and localised effects: • Ingress of pollutants and sediments to watercourses in runoff from construction compounds during their establishment and operation. • Contamination of shallow groundwater from accidental spillage from and disturbance of existing land contamination by construction activities. Effects on the groundwater bodies are not likely to be significant due to the shallow, superficial nature of works required to establish the proposed compounds with no requirement for dewatering.
Permanent above ground infrastructure	HAGI and BVI infrastructure construction	River – In Sinderland Brook (GB112069060980), Whittle Brook (Mersey Estuary) (GB112069060990) Weaver (Dane to Frodsham) (GB112068060500) Mersey/ Manchester Ship Canal (Irwell/Manchester Ship Canal to Bollin) (GB112069061011) River Weaver (Barnet to Valley Brook) (GB112068060461)	Potential for the following short-term, temporary and localised effects: • Pollutant and sediment ingress to watercourses via runoff from areas disturbed by construction and discharge of groundwater dewatered from excavations. • Contamination of shallow groundwater from accidental spillage from and disturbance of existing land contamination by construction activities. • Higher Walton HAGI is adjacent to the Manchester Ship Canal.

Development activity (during construction)	Aspects of relevance to the WFD	Water bodies - Scoped in/out	Justification
		River Weaver (Valley Brook to Winsford Flashes) (GB112068060462) Puddinglake Brook (GB112068060220) Cuddington Brook (Source to Crowton Brook) (GB112068060480) Cogshall Brook (GB112068060510) Gale Brook (GB112068060430) Canal – In Manchester Ship Canal (GB71210004) Non-reportable – In Groundwater – Out	Quantitative effects on the groundwater bodies are not likely to be significant due to the relatively shallow nature and small spatial scale of the proposed permanent infrastructure works and the limited potential for dewatering.

Table 7E.5 WFD scoping of the Project activities against WFD hydromorphology receptors for the River Mersey WFD waterbody.

Consider if the Activity may affect WFD hydromorphology receptors:	Scoped in or out	Justification
Could the Project impact on the hydromorphology (for example morphology or tidal patterns) of a waterbody at high status?	Out	Mersey is at Moderate Status.
Could the Project significantly impact the hydromorphology of any waterbody?	In	As the Project includes crossings of the Mersey there is potential for an impact on hydromorphology.
Is the Project in a waterbody that is heavily modified for the same use as your activity?	Out	The waterbody is designated as heavily modified, this designation is not due to pipeline infrastructure. The Project therefore has a new function unrelated to the existing waterbody modification.

5.1.7 **Table 7E.6** assesses the potential impacts of the Project against the WFD biological receptors for the Mersey WFD waterbody.

5.1.8 The assessment against biological receptors requires consideration against the presence of higher and lower sensitivity habitats. The Project could potentially impact upon:

- Higher sensitivity habitats:
 - ▶ Mussel beds – greater than 500m from the Draft Order Limits.
 - ▶ Saltmarsh – present within 500m of the Draft Order Limits.
 - ▶ Subtidal kelp beds – greater than 500m from the Draft Order Limits.
- Lower sensitivity habitats. The following habitats are present within the Mersey Transitional waterbody:
 - ▶ Cobbles. Gravel and shingle – greater than 500m from the Draft Order Limits.
 - ▶ Intertidal soft sediment; Small amount of intertidal soft sediment in the Draft Order Limits but less than 1% of the total habitat area.
 - ▶ Rocky shore – greater than 500m from the Draft Order Limits.
 - ▶ Subtidal rocky reef – greater than 500m from the Draft Order Limits
 - ▶ Subtidal soft sediment – greater than 500m from the Draft Order Limits

Table 7E.6 WFD scoping of the Project activities against WFD biological receptors for the Mersey WFD waterbody

Consider if the Activity may affect WFD biological receptors:	Scoped in or out	Justification
Is the footprint of the Project 0.5km ² or larger?	Out	The footprint of the Project (within the Mersey WFD waterbody) is 0.14km ² . However, as the permanent development will all be laid beneath the Mersey there will be no permanent footprint within the Mersey WFD waterbody.
Is the footprint of the Project 1% or more of the waterbody's area?	Out	The footprint of the Project is less than 1% of the area of the Mersey WFD waterbody.
Is the footprint of the Project within 500m of any higher sensitivity habitat?	In	Areas of saltmarsh (A2.5) within the Mersey WFD waterbody are within the footprint of the project This is associated with a watercourse crossing.
Is the footprint of the Project 1% or more of any lower sensitivity habitat?	Out	The footprint of the Project within the Mersey WFD waterbody is less than 1% of any lower-sensitivity WFD habitats.
Is the Project in an estuary and could it affect fish in and outside the estuary, could it delay or prevent fish entering it and could affect fish migrating through the estuary?	Out	Although project activities would be within the estuary, no in-channel works are proposed and therefore no physical barriers to fish migration would occur.
Could the Project impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier, noise, chemical change or a change in depth or flow)?	In	The pipeline will be constructed via HDD beneath the Mersey. This may have the potential for impacts on normal fish behaviour due to silt mobilisation, noise, and vibration from the bank side which may cause a disturbance to fish locally within the channel. However the HDD will be at sufficient depth beneath the channel bed and the HDD compounds will be set back at least 75m from the banks, see Chapter 10: Noise and Vibration , for further details.

Consider if the Activity may affect WFD biological receptors:	Scoped in or out	Justification
Could the Project cause entrainment or impingement of fish?	Out	The Project is not expected to include activities within the Mersey waterbody that could cause entrainment or impingement of fish.

Table 7E.7 WFD scoping of the Project activities against the WFD water quality receptors for the Mersey WFD waterbody.

Consider if the Activity may affect WFD water quality receptors:	Scoped in or out	Justification
Could the Project affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)?	Out	Construction activities adjacent to and within the wider watercourse catchment have the potential to release sediment into the channel, affecting water clarity and nutrients. The Mersey Estuary has high turbidity under baseline conditions due to the macro tidal environment. Therefore, any sediment release is unlikely to be significantly greater than background conditions and would be diluted as a result of the tidal process. The risk of sediment release would also be managed through the Construction Environmental management Plan (CEMP).
Is the Project in a waterbody with a history of harmful algae?	Out	No history of harmful algae.
Is the Project in a waterbody with a phytoplankton status of moderate, poor or bad?	In	Mersey has Moderate phytoplankton status.
If your activity uses or releases chemicals (for example through sediment disturbance or building)	Out	The latest Cycle 3 chemical status of the waterbody is 'Does not require assessment', however, the 2019 status was 'Fail'. However, this is in relation to a change in methodology of assessment from the Environment Agency which caused all

Consider if the Activity may affect WFD water quality receptors:	Scoped in or out	Justification
works) consider if the chemicals are on the Environmental Quality Standards Directive (EQSD) list.		waterbodies to fail the chemical test in the 2019 Cycle 3 round. The chemical status for previous Cycle 2 rounds however was also 'Fail'. Any chemicals released are unlikely to have a significant impact due to dilution within the far larger waterbody area, and the risk from sediment disturbance would also be managed through the CEMP.
If your activity uses or releases chemicals (for example through sediment disturbance or building works) consider if it disturbs sediment with contaminants above Centre for Environment, Fisheries and Aquaculture Science (Cefas) Action Level 1.	Out	The quantity of contaminants above Cefas Action Level 1 in the local sediment is unknown. However, sediment disturbance is unlikely to have a significant impact due to dilution within the far larger waterbody area, and the risk of sediment release would also be managed through the CEMP.
If your activity has a mixing zone (like a discharge pipeline or outfall) consider if the chemicals released are on the Environmental Quality Standards Directive (EQSD) list.	Out	There is potential for new discharges as a result of hydrostatic testing of the pipeline. However, these would be temporary and localised. The pipeline is unlikely to contain contaminants within it that are on the EQSD list. The discharge of hydrostatic test water would be monitored for water quality before discharge with limits set within the discharge permits required.

Table 7E.8 WFD scoping of the Project activities against WFD Protected Areas and INNS for the Mersey WFD waterbody

Consider if the Activity may Impact Protected Areas or INNS:	Scoped in or out	Justification
Is the Project within 2km of any WFD protected area?	In	Project within 2km of Mersey Estuary SSSI, RAMSAR, SPA, LWS
Could the Proposed Development introduce or spread INNS?	In	Project activities could spread INNS that are present in watercourses and estuaries.

5.1.9 **Table 7E.9** summarises the scoping of the Mersey WFD waterbody against project activities, based on the Clearing the Waters for All assessment presented in **Table 7E.4** to **Table 7E.8**.

Table 7E.9 Summary of WFD scoping of the Project activities against for the Mersey WFD waterbody

Project activities	Scoped in or out	Justification against receptors
Pipeline corridor laying	Out	As the Mersey is an estuary the only pipeline to be laid within it will be below the waterbody via trenchless crossing techniques.
Hydrostatic testing	In	Water will be abstracted from the Mersey for hydrostatic testing and may impact on hydromorphology, Biology: fish, and water quality.
Pipeline corridor watercourse crossings – Open-cut	Out	No open-cut watercourse crossings are proposed for the Mersey.
Pipeline corridor watercourse crossings – Trenchless	In	The crossing of the waterbody, and potential changes in flow, banks, sediment, vibration, noise and chemical pollution may result in the potential for impacts on hydromorphology, habitat, fish, and water quality elements.

Project activities	Scoped in or out	Justification against receptors
Temporary access tracks	Out	No new temporary access tracks are located within 100m of the Mersey WFD waterbody.
Temporary construction compounds	In	Potential for increased sediment during construction, and the chemical pollution may impact on hydromorphology, Biology: habitat, Biology: fish, and water quality.
Permanent above ground infrastructure	Out	No permanent above-ground infrastructure is present in the vicinity of the Mersey WFD waterbody.

6. WFD Impact Assessment

6.1 WFD Water Bodies Baseline

WFD Status

- 6.1.1 The WFD water bodies screened into the assessment are outlined in **Section 4**. This Section presents baseline information on the current (2022 Cycle 3) WFD classifications and the objectives of the waterbody³⁶. While the operational phase of the Project has been screened out, the waterbody objectives are presented here, along with reasons for not achieving Good status, in order to assess the likelihood of the Project affecting the ability of the water bodies to achieve these objectives. Full details of the classifications, reasons for not achieving good and objectives for all water bodies are included in **Appendix 7B: Detailed water environment baseline information**, with a summary provided here.

River water bodies

- 6.1.2 Twenty one River WFD water bodies have been screened into the assessment; eight are classed as HMWBs and are therefore classified using Potential, rather than Status.
- 6.1.3 Of the thirteen screened in non-HMWBs, four are achieving Poor Status. This is predominantly due to poor soil, nutrient, and livestock management, as well as farm infrastructure and barriers to ecological continuity. Urbanisation is also a reason for not achieving Good Status. The nine remaining non-artificial or HMWBs are achieving Moderate Status. This is due to a variety of reasons including poor nutrient, soil and livestock management, as well as urbanisation and sewage discharge and private sewage treatment.
- 6.1.4 All of the eight HMWBs are achieving Moderate Potential, due to the Mitigation Measures Assessment³⁷ being classed as Moderate or Less.
- 6.1.5 The objectives of the water bodies are listed below. Where a waterbody does not have an objective of Good Ecological Status/Potential by 2027, the justifications for this are listed. For water bodies where the objective has a target date in the past, this is because the Environment Agency have deemed that the waterbody is at the highest Status/Potential it is able to achieve as further improvement would be technically infeasible or disproportionately expensive. For these water

³⁶ This represents the most up to date classification.

³⁷ Ecological Potential in artificial and heavily modified water bodies is determined by an assessment of whether measures are properly in place to mitigate the impacts of any modification on the ecology of the waterbody. If all WFD mitigation measures are in place, the waterbody has been classified as being at Good Potential. If one or more identified WFD mitigation measures are absent the waterbody has been classified as Moderate Potential.

bodies the target is to maintain the Status/Potential which it is currently achieving.

6.1.6 Good Ecological Status/Potential by 2027 (low confidence):

- Whittle Brook (Mersey Estuary - GB112069060990);
- River Weaver (Barnet to Valley Brook - GB112068060461)
- River Weaver (Valley Brook to Winsford Flashes - GB112068060462);
- Weaver (Winsford Flashes to Dane - GB112068060463);
- Weaver (Dane to Frodsham - GB112068060500);
- Gale Brook (GB112068060430);
- Puddinglake Brook (GB112068060220);
- Bogart Brook (GB112068060540);
- Cuddington Brook (Source to Crowton Brook - GB112068060480)
- Wade Brook (GB112068060370);
- Arley Brook (Source to Gale Brook - GB112068060420);
- Keckwick Brook (GB112068060520);
- Cogshall Brook (GB112068060510); and
- Hardshaw (Windle) Brook (GB112069061210).

6.1.7 Moderate Ecological Status by 2027 (low confidence):

- Bollin (Ashley Mill to Manchester Ship Canal - GB112069061382):
 - ▶ Disproportionately expensive: Disproportionate burdens;
- Peckmill Brook, Hoolpool Gutter at Ince Marshes (GB112068060330)
 - ▶ Disproportionately expensive: Disproportionate burdens; and
 - ▶ Technically infeasible: No known technical solution is available

6.1.8 Moderate Ecological Status/Potential by 2015 (low confidence):

- Dane (Wheelock to Weaver - GB112068060470):
 - ▶ Disproportionately expensive: Disproportionate burdens; and
 - ▶ Technically infeasible: No known technical solution is available
- Mersey/ Manchester Ship Canal (Irwell/Manchester Ship Canal to Bollin - GB112069061011):
 - ▶ Disproportionately expensive: Unfavourable balance of costs and benefits;
 - ▶ Technically infeasible: Cause of adverse impact unknown; and

- ▶ Technically infeasible: No known technical solution is available.
- Mersey (Bollin confluence to Howley Weir) including Padgate Brook (GB112069061012):
 - ▶ Disproportionately expensive: Disproportionate burdens;
 - ▶ Technically infeasible: No known technical solution is available.

6.1.9 Moderate Ecological potential by 2021

- Sutton Brook (GB112069061170)
 - ▶ Disproportionately expensive: Disproportionate burdens;
 - ▶ Technically infeasible: No known technical solution is available

6.1.10 Poor ecological status by 2027 (low confidence)

- Sinderland Brook (GB112069060980):
 - ▶ Disproportionately expensive: Unfavourable balance of costs and benefits;
 - ▶ Disproportionately expensive: Disproportionate burdens; and
 - ▶ Technically infeasible: No known technical solution is available

Canal water bodies

6.1.11 Five canal WFD water bodies have been screened in for assessment. All of them are classified as being at Moderate Ecological Potential. Landfill leaching, atmospheric deposition, sewage discharge and contaminated waterbody bed sediments are reasons listed for not achieving Good.

6.1.12 The objective of all the screened in Canal WFD bodies is Good Ecological Potential by 2027.

Transitional water bodies

6.1.13 The Mersey is the only transitional WFD waterbody within the Study Area. The Mersey is achieving Moderate Ecological Status. The reasons for not achieving Good are contaminated land in the catchment and due to a contaminated waterbody bed.

6.1.14 The objective of the Mersey Transitional WFD waterbody is Good Ecological Status by 2027.

Lake water bodies

6.1.15 No lake water bodies have been screened in for further assessment.

Non reportable water bodies

6.1.16 The study area also includes an area of surface waterbody catchment that is not reportable under the WFD. While they are not reportable under the WFD, these non-reportable waterbodies are still legally protected from pollution, modification and abstraction.

- 6.1.17 The areas shown as being non-reportable water bodies that are considered within this assessment are outlined in **Figure 7.2**. None of the non-reportable areas here has been formally designated with names under WFD and they will be treated as a single waterbody for the purposes of this assessment.
- 6.1.18 Baseline conditions for non-reportable water bodies are not presented here as they are not routinely monitored and their WFD Status is not reported on.
- 6.1.19 It is assumed for the purposes of this assessment that all non-reportable water bodies are currently achieving Good Ecological Status.

Groundwater bodies

- 6.1.20 Five WFD groundwater bodies have been screened into the assessment. All five are currently achieving Poor Status. The reasons for not achieving Good are predominantly poor nutrient management, Saline intrusion and abandoned mines have also affected the Manchester and East Cheshire Permo-Triassic Sandstone Aquifers and the Sankey and Glaze Carboniferous Aquifers respectively.
- 6.1.21 The objectives of the water bodies are listed below. Where a waterbody does not have an objective of Good Status by 2027, the justifications for this are listed
- 6.1.22 Good by 2027:
- Wirral and West Cheshire Permo-Triassic Sandstone Aquifers (GB41101G202600);
 - Weaver and Dane Quaternary Sand and Gravel Aquifers (GB41202G991700); and
 - Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers (GB41201G101700).
- 6.1.23 Good by 2021:
- Manchester and East Cheshire Permo-Triassic Sandstone Aquifers (GB41201G101100).
- 6.1.24 Poor by 2015:
- Sankey and Glaze Carboniferous Aquifers (GB41202G100100):
 - ▶ Disproportionately expensive: Disproportionate burdens and
 - ▶ Technically infeasible: No known technical solution is available.

Hydromorphology

- 6.1.25 Full details of the hydromorphology assessments, including the methodology and results are given in **Appendix 7C – Hydromorphology Desk based study and site survey** with a summary presented here.
- 6.1.26 Each of the watercourses proposed to be crossed by the pipeline has been designated a classification of sensitivity to hydromorphological change, as part of the hydromorphological assessment. All 31 Environment Agency main rivers were assessed as part of a desk assessment, to identify key watercourse

crossings that required further assessment through field survey. The desk-based assessment identified 13 Environment Agency Main River waterbody crossings that required further hydromorphology surveys with site walkovers subsequently undertaken in August 2023. At present, the River Dane and the crossings of the Pendlebury Brook has not been visited.

- 6.1.27 Following surveys, all visited watercourses were assigned a conservation value/susceptibility to disturbance. These values ranged from 1 to 7. See **Table 2 of Annex C of Appendix 7C – Hydromorphology Desk based study and site survey** for a summary of the rationale for designating values.
- 6.1.28 The lowest values of 1 were applied to navigable sections of the River Weaver with fixed concrete banks, locks and locations which are dredged. The highest conservation values of 7 have been designated for the River Dane and River Mersey. Both the River Dane and River Mersey are to be crossed by trenchless crossing methods, which avoid any excavation of the wetted channel areas and any direct disturbance of the bed and bank morphology.
- 6.1.29 While trenchless crossing approaches will be undertaken where possible, there are a multiple locations where trenched crossings will be undertaken. The Whitley Brook and Puddinglake Brook crossings were designated conservation values of 5 and 6, but are proposed to be crossed via open-cut trenching construction. Site-specific factors, such as ground conditions, topography and available space for compounds etc., preclude a trenchless option.

Ecology Baseline

- 6.1.30 The aquatic ecology baseline is presented within **Chapter 5: Biodiversity**.

6.2 Project activities within each WFD waterbody

- 6.2.1 **Table 7E.10 to Table 7E.14** present the quantitative information on the screened in project activities which are proposed within each WFD waterbody.
- 6.2.2 Screening was undertaken using GIS to quantify the number and area of project components within each WFD waterbody. Where project components such as HAGIs are situated across waterbody boundaries these are counted in both waterbodies and the associated compound area halved between waterbodies.
- 6.2.3 Temporary construction compounds include material storage areas, trenchless crossing compounds, HAGI temporary construction compounds and BVI temporary construction compounds.
- 6.2.4 Temporary access tracks do not include the use of existing public highways, which have been excluded from further assessment.

Table 7E.10 Project activities within WFD River waterbodies

Waterbody	Catchment area (km²)	Length of pipeline (km)	No. of open-cut watercourse crossings within the waterbody catchment	No. of Trenchless watercourse crossings within the waterbody catchment (and no. on a WFD river)	Length of temporary access track (km)	No. of temporary access track watercourse crossings	No. of HAGIs (area m²)	No. of BVIs	No. of temporary construction compounds (area km²)
Puddinglake Brook (GB112068060220)	13.39	1.84	1	1	3.77	1	1 (10,000)	0	8 (0.2)
Arley Brook (Source to Gale Brook) (GB112068060420)	20.17	4.09	4	0	4.10	4	0 (0)	0	2 (0.01)
Weaver (Winsford Flashes to Dane) (GB112068060463)	19.74	4.30	0	2	3.96	0	0 (0)	0	2 (0.09)
Dane (Wheelock to Weaver) (GB112068060470)	12.85	2.68	2	1	3.12	3	0 (0)	0	7 (0.13)
Cogshall Brook (GB112068060510)	27.64	7.18	3	0	7.72	3	1 (5,000)	0	9 (0.15)
Keckwick Brook (GB112068060520)	24.63	4.68	1	1	4.48	1	0 (0)	0	9 (0.16)
Bogart Brook (GB112068060540)	12.43	1.15	0	0	1.29	0	0 (0)	0	1 (0.02)
Peckmill Brook, Hoolpool Gutter at Ince Marshes. (GB112068060330)	26.42	2.92	10	3	10.15	14	0 (0)	0	6 (0.14)
Weaver (Dane to Frodsham) (GB112068060500)	61.28	20.11	29	8	27.93	36	2 (15,000)	0	31 (0.65)
Wade Brook (GB112068060370)	52.80	0.16	0	0	0.63	0	0 (0)	0	3 (0.01)
Gale Brook (GB112068060430)	13.48	3.49	6	0	3.76	6	0 (0)	1	8 (0.18)
Sinderland Brook (GB112069060980)	15.96	3.18	4	0	3.23	3	1 (10,000)	0	2 (0.02)
Mersey (Bollin conf to Howley weir) (GB112069061012)	19.60	0.40	0	0	0.33	0	0 (0)	0	2 (0.001)
Mersey/Manchester Ship Canal (MSC/Irwell to Bollin) (GB112069061011)	15.39	2.15	2	0	3.52	0	1 (10,000)	0	3 (0.03)

Waterbody	Catchment area (km²)	Length of pipeline (km)	No. of open-cut watercourse crossings within the waterbody catchment	No. of Trenchless watercourse crossings within the waterbody catchment (and no. on a WFD river)	Length of temporary access track (km)	No. of temporary access track watercourse crossings	No. of HAGIs (area m²)	No. of BVIs	No. of temporary construction compounds (area km²)
Bollin (Ashley Mill to Manchester Ship Canal) (GB112069061382)	29.25	3.51	1	3	3.78	3	0 (0)	0	9 (0.15)
Hardshaw (Windle) Brook (GB112069061210)	25.09	3.66	0	0	0.91	0	0 (0)	0	5 (0.01)
Whittle Brook (Mersey Estuary) (GB112069060990)	14.59	0.48	0	0	0.52	0	1 (10,000)	0	1 (0.07)
Sutton Brook (GB112069061170)	18.79	5.52	3	0	5.70	3	0 (0)	0	8 (0.21)
Cuddington Brook (Source to Crowton Brook) (GB112068060480)	24.50	4.17	1	0	4.96	1	0 (0)	1	11 (0.17)

Table 7E.11 Project activities within WFD Groundwater bodies

Groundwater bodies									
Waterbody	Waterbody area (km²)	Length of pipeline (km)	No of open-cut crossings	No. of Trenchless crossings	Length of temporary access track	No. of temporary access crossings in the Ground waterbody	No. of HAGIs (area m²)	No. of BVIs	No. of temporary construction compounds (area km²)
Wirral and West Cheshire Permo-Triassic Sandstone Aquifers (GB41101G202600)	409.94	9.94	32	5	22.10	40	2 (15,000)	0	10 (0.18)
Manchester and East Cheshire Permo-Triassic Sandstone Aquifers (GB41201G101100)	367.35	2.90	4	0	4.37	1	1 (10,000)	0	3 (0.03)
Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers (GB41201G101700)	627.53	20.78	15	5	23.01	15	1 (10,000)	0	48 (0.79)
Sankey and Glaze Carboniferous aquifers (GB41202G100100)	239.28	7.39	1	0	4.38	1	1 (10,000)	0	12 (0.18)
Weaver and Dane Quaternary Sand and Gravel Aquifers (GB41202G991700)	1513.70	58.65	31	14	63.74	36	5 (45,000)	2	86 (1.89)

Table 7E.12 Project activities within WFD Canal waterbodies

Canal water bodies									
Waterbody	Length of waterbody (km)	Length of pipeline (km)	No. of open-cut crossings across the canal	No. of Trenchless crossings across the canal	Length of temporary access track (km)	No. of temporary access crossings across the canal	No. of HAGIs (area m²)	No. of BVIs	No. of temporary construction compounds (area km²)
Bridgewater Canal (GB71210001)	60.99	0.44	0	2	0.47	0	0	0	4 (0.05)
Manchester Ship Canal (GB71210004)	38.69	2.42	0	1	2.37	0	1 (10,000)	0	9 (0.03)
Sankey Canal (GB71210055)	12.95	0.20	0	2	0.05	0	0	0	1 (0.01)
Trent and Mersey Canal, summit to Preston Brook Tunnel (GB71210247)	49.23	0.69	0	3	1.74	0	0	0	6 (0.06)
Weaver Navigation (canal section Frodsham to Weston Point Docks) (GB71210545)	7.47	0.50	0	2	0.47	0	0	0	5 (0.04)

Table 7E.13 Project Activities within WFD Transitional waterbodies

Transitional water bodies									
Waterbody	Waterbody area (km²)	Length of pipeline (km)	No. of open-cut crossings	No. of Trenchless crossings across the waterbody	Length of temporary access track (km)	No. of temporary access crossings across the waterbody	No. of HAGIs (area m²)	No. of BVIs	No. of temporary construction compounds (area km²)
Mersey (GB531206908100)	81.72	1.09	0	5	0	0	0	0	11 (0.02)

Table 7E.14 Project Activities within WFD Non-Reportable waterbodies

Non-reportable waterbodies									
	Waterbody area (km²)	Length of pipeline (km)	No. of open-cut crossings	No. of Trenchless crossings (and no. on a WFD river)	Length of temporary access track (km)	No. of temporary access crossings	No. of HAGIs (area m²)	No. of BVIs	No. of temporary construction compounds (area km²)
	136.59	23.84	16	5 (0)	23.72	15	4 (35,000)	1	50 (0.68)

Hydrostatic testing

- 6.2.5 The locations where water will be abstracted for hydrostatic testing of the proposed pipeline have not yet been finalised. All abstractions will be subject to the approval of the Environment Agency as the regulatory body. The locations where water is proposed to be abstracted from and the WFD waterbody these locations are within are shown in **Table 7E.15**.

Table 7E.15 Abstraction locations for hydrostatic testing

Waterbody where water is to be abstracted	WFD waterbody (ID)	WFD waterbody type
Weaver Navigation	Weaver Navigation (canal section Frodsham to Weston Point Docks) (GB71210545)	Canal
River Weaver (at Willow Green)	Weaver (Dane to Frodsham) (GB 112068060500)	River
River Weaver (at Hartford)	River Weaver (Winsford Flashes to Dane) (GB112068060463)	River
Bridgewater Canal	Bridgewater Canal (GB71210001)	Canal
Manchester Ship Canal	Manchester Ship Canal (GB71210004)	Canal
River Mersey	Mersey (GB531206908100)	Transitional

6.3 Embedded Environmental Measures Incorporated into the Project

- 6.3.1 The embedded environmental measures incorporated into the Project are outlined in **Table 7.16** of **Chapter 7: Water Environment**. Embedded environmental measures are associated with construction activities, particularly pipeline construction and related watercourse crossing points, temporary access tracks and compounds, HAGIs and associated drainage.

- 6.3.2 **Table 7E.16** relates to any embedded environmental measures incorporated into the design of the Project to mitigate against the potential effects to the WFD quality elements.
- 6.3.3 All construction activities will be carried out in accordance with the CEMP and Pollution Prevention Plan (PPP) to ensure that any unforeseen accidents during construction (such as freak weather etc.) can be mitigated as far as practicable to reduce the risk of any negative effects affecting WFD status.

Table 7E.16 Summary of Embedded Environmental Measures

WFD element	Potential effect on WFD element	Embedded environmental measure to manage potential effect*
Hydromorphology	Alteration of flow regime – via input to watercourses and via indirect changes within the catchment.	D-1 Underground pipeline D-4 Temporary access tracks design D-5 Management of subsurface flow pathways C-1 Implementation of a CEMP C-2 A Drainage and Water Management Plan (DWMP) C-4 Diversion and reinstatement of existing drainage networks C-6 Temporary provision of surface water drainage for construction areas C-7 Management of dewatering excavations C-8 Silt management measures C-10 Timely reinstatement following completion of works C-11 Permitting of Discharges C-12 Discharge outfall design C-13 A Pollution Prevention Plan (PPP) C-21 Pre-commissioning pipeline testing
Hydromorphology	Alteration of channel morphology.	C-9 Stand-off distances from watercourses C-25 A Watercourse Crossing Plan (WCP) C-26 Trenchless pipeline crossings C-27 Trenched crossings of minor watercourses C-28 Temporary construction access watercourse crossings
Hydromorphology	Lateral and longitudinal connectivity.	C-9 Stand-off distances from watercourses C-25 A Watercourse Crossing Plan (WCP) C-26 Trenchless pipeline crossings C-27 Trenched crossings of minor watercourses C-28 Temporary construction access watercourse crossings

WFD element	Potential effect on WFD element	Embedded environmental measure to manage potential effect*
Chemical and Physico – chemical	Mobilisation of sediment or contaminated sediment / material in the catchment that has the potential to enter the watercourse network. Introduction and / or mobilisation of sediment or contaminated sediment / material within the channel that has the potential to be transported downstream Alteration to surface water quality.	D-4 Temporary access track design D-5 Management of subsurface flow pathways C-1 Implementation of a CEMP C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-17 Measures to avoid pollution impacts from disturbance of contaminated land (Materials Management Plan, MMP) C-13 A Pollution Prevention Plan (PPP) C-14 Storage or hydrocarbons and other chemicals C-15 Refuelling, inspection and maintenance C-17 Measures to avoid pollution impacts from disturbance of contaminated land (Materials Management Plan, MMP) C-18 Treatment and discharge of contaminated groundwater C-19 A monitoring and inspection programme C-20 Foul drainage from temporary compounds C-21 Pre-commissioning pipeline testing
Chemical	Release of pollutants into surface or groundwater has the potential to impact Chemical Status.	C-13 A Pollution Prevention Plan (PPP) C-14 Storage or hydrocarbons and other chemicals C-15 Refuelling, inspection and maintenance C-17 Measures to avoid pollution impacts from disturbance of contaminated land (Materials Management Plan, MMP) C-18 Treatment and discharge of contaminated groundwater C-19 A monitoring and inspection programme.

WFD element	Potential effect on WFD element	Embedded environmental measure to manage potential effect*
Biological Quality	Mobilisation of sediment or contaminated sediment / material in the catchment that has the potential to enter the watercourse network and have a potential knock-on impact on the habitats of fish, macrophytes, phytobenthos and invertebrates. Introduction and / or mobilisation of sediment or contaminated sediment / material within the channel that has the potential to be transported downstream and have potential knock-on impact on the habitats of fish, macrophytes, phytobenthos and invertebrates.	D-4 Temporary access track design C-1 Implementation of a CEMP C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-17 Measures to avoid pollution impacts from disturbance of contaminated land (Materials Management Plan, MMP) C-21 Pre-commissioning pipeline testing 16 Screening of pumps
Groundwater Quantity	Alteration to groundwater quantity	D-1 Management of subsurface flow pathways C-2 A Drainage and Water Management Plan (DWMP) C-5 Private abstraction risk assessment and mitigation strategy C-7 Management of dewatering of excavations C-11 Permitting of discharges
Groundwater Chemical	Alteration to groundwater quality.	C-1 Implementation of a CEMP C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas

WFD element	Potential effect on WFD element	Embedded environmental measure to manage potential effect*
		C-7 Management of dewatering of excavations C-11 Permitting of discharges C-13 A Pollution Prevention Plan (PPP) C-14 Storage of hydrocarbons and other chemicals C-15 Refuelling, inspection and maintenance C-16 Handling and processing of concrete C-17 Measures to avoid pollution impacts from disturbance of contaminated land (Materials Management Plan, MMP) C-18 Treatment and discharge of contaminated groundwater C-19 A monitoring and inspection programme C-20 Foul drainage from temporary compounds C-29 Managing groundwater risk during HDD

* for full description see **Table 7.16 of Chapter 7: Water Environment**

Reinstatement principles

- 6.3.4 An Outline Landscape and Ecological Management Plan (LEMP) has been prepared to provide the measures with regards to landscaping, habitat creation and reinstatement and the monitoring and management of these measures.
- 6.3.5 Landscape elements and habitats within areas that will be subject to temporary loss during the installation of the pipeline will have habitats and associated landscape elements (such as hedgerows) reinstated.
- 6.3.6 For open-cut watercourse crossings, the Outline LEMP states that the impacts during construction would be for relatively short periods. Following the installation of the pipeline beneath the watercourse, the bed material removed would be placed back in-situ and the banks re-profiled as necessary. Bank side vegetation would either be left to regenerate naturally where rough grassland or ruderal vegetation fringes are dominant, sown with an appropriate seed mix where the ditch is fringed by agriculturally managed habitats or planted with scrub where these habitats lie adjacent to the watercourse.
- 6.3.7 In addition, **Chapter 5: Biodiversity** includes the embedded environmental measure No. 10 'Habitat reinstatement'. See details above.

6.4 North West River Basin District Management Plan (RBMP) Programme of Measures

- 6.4.1 The Cycle 3 North West River Basin RBMP²¹ includes a Programme of Measures which have been identified to support the achievement of WFD objectives for WFD waterbodies within the River Basin District.
- 6.4.2 The North West River Basin District RBMP program of measures are presented in **Table 7E.17**. The measures have been grouped into broad categories for the purposes of assessment, with the individual measures being specified within the RBMP. The table also justifies how the Project will not affect the ongoing implementation of these measures or the ability of the measures to be implemented in the future.

Table 7E.17 North West River Basin District RBMP programme of measures

Category	Justification
Catchment level investment programme	There are no works within the River Irk or Valley Brook catchments, as such the Project should have no impact on the catchment level investment programmes. None of the project activities during construction or operation will impact on the ability of any of the catchment level investment programmes to be undertaken.
Countryside stewardship	None of the project activities during construction or operation will impact on the ability to any of the countryside stewardship programmes to be undertaken.
Environmental strategy and policy	None of the project activities during construction or operation will impact the UK Government, the Environment Agency or Defra advancing these environmental strategies and policies.
Flood risk management and coastal erosion investment programme	None of the project activities during construction and operation will impact flood risk management and coastal erosion investment programmes.
Measures addressing ecological and habitat improvement	None of the project activities during construction and operation will impact on measures addressing ecological and habitat improvement. There are no works within the River Irt or River Kent catchments, or within Cumbria, as such the Project should have no impact on the catchment level investment programmes.
Measures to address	No structural modifications are proposed to any channels. Any trenched crossings will be temporary, of short duration and will be reinstated to

Category	Justification
physical modification	the previous condition. Therefore, the Project will not impact existing or future improvements to channel/bed and/or banks. No addition of any engineered works is proposed in-channel. In addition, the proposed works do not influence existing or future removal or of in-channel engineering structures. No changes are proposed to any existing barriers to fish migration, and no permanent barriers to fish migration will be created. There may be a temporary impact on fish migration during trenched crossings however works will be timed to avoid migratory seasons and the works will be temporary and of a limited duration. Vegetation clearance is expected to be spatially and temporarily limited. The scale of the works is negligible compared to the size of the waterbody and will be reinstated following construction. Therefore, no consequent impact on riparian zone and/or wetland habitats improvements is foreseen.
Measures to manage invasive nonnative species	Vegetation clearance is expected to be spatially and temporarily limited. In addition, no impact is foreseen on mitigation, control, and eradication of invasive non-native species.
Measures to manage pollution from mine waters	No changes proposed which would affect pollution pathways from mine waters.
Measures to manage pollution from towns, cities and transport	No changes proposed to diffuse pollution pathway from towns, cities and transport.
Water company investment programme	None of the project activities during construction and operation will impact on water company investment programmes.
Water resources sustainability measures	None of the project activities during construction and operation will impact on water resources sustainability measures.
Woodland creation	None of the project activities during construction and operation will impact on measures concerning woodland creation.

- 6.4.3 **Table 7E.17** indicates that none of the project activities are anticipated to have negative impacts on the RBMP programme of measures. Conversely, none of the project activities are anticipated to contribute to any of the program of measures.

6.5 WFD Heavily modified waterbodies mitigation measures assessment

- 6.5.1 For all of the WFD HMWB screened in, the WFD mitigation measures have been provided by the Environment Agency. **Table 7E.18** presents the WFD mitigation measures and the justification as to how the Project will impact the ongoing implementation of the WFD mitigation measures or the ability of the mitigation measures to be implemented in future. The WFD mitigation measures have been collated from all the artificial or heavily modified waterbodies and are presented at the Tier 2 and Tier 3 levels.

Table 7E.18 WFD Heavily Modified Waterbodies WFD Mitigation Measures Assessment

Tier 2 Pressures	Tier 3 Pressures	Justification
Structural modification	- Fish passes - Enhance ecology - Changes to locks etc - Reduce fish entrainment	- The impact of the permanent development in operation will not affect the ability of these measures being implemented. - The construction period will be of limited duration and limited spatial extent compared with the WFD waterbody and likely to have minimal impact on the implementation of the measures. - No permanent structural modification proposed. No works in water bodies to impact any current modification works. - No permanent changes proposed to barriers to fish migration. There are no new fish passes or changes to fish passes proposed. There will be no structures within the watercourse which would prevent or require the installation fish passes. - No changes to locks or other structures are proposed as part of the Project. - The pipeline will be buried and therefore would not adversely impact ecology long-term. Future enhancement would be possible. - The Project will not permanently impact on fish entrainment.
Operation and maintenance	- Avoid the need to dredge - Dredging disposal strategy - Reduce impact of dredging - Reduce sediment resuspension - Retime dredging or disposals - Sediment management - Dredge disposal site selection - Manage disturbance - Phased de-watering - Selective vegetation control - Vegetation control - Vegetation control timing - Invasive species techniques - Retain habitats - Sediment management strategy - Maintenance – minimise habitat impact - Maintenance – prevent sediment transfer - Phased de-watering - Invasive species techniques	- The impact of the permanent development in operation will not affect the ability to implement and sustain operations and maintenance measures. - The construction phase will be of limited duration and limited spatial extent and is likely to have minimal impact on the operation and maintenance measures. - Embedded mitigations are in place to manage sediment due to construction. - No dredging is proposed. No works in water bodies to impact any current dredging works. - The scale of the works is negligible compared to the size of the waterbody, and it would not impact existing or future sediment management operations. - Some vegetation removal would occur during construction. At watercourse crossing locations, the structure of the riparian zone would be reinstated within two years of the construction works and there would be no long-term impact to the vegetation within this waterbody. The Project would not prevent further vegetation control from taking place. - Invasive Non-Native Species (INNS) would be controlled during the construction works. The buried pipeline would not impact the future control of INNS.
Working with physical form and function	- Set-back embankments - Floodplain connectivity - Remove obsolete structure - Remove or soften hard bank - Preserve or restore habitats - In-channel morph diversity - Bank rehabilitation - Re-opening culverts	- The impact of the permanent development in operation will not affect the ability to implement and sustain measures addressing working with physical form and function. - The construction phase will be of limited duration and limited spatial extent and likely to have minimal impact on the working with physical form and function measures. - No changes proposed to physical form and function. In addition, the installation of cabling will be buried to a suitable depth so as not to impede future lateral and vertical channel adjustment of those watercourses crossed by the Project. - There will be no change to structures within the watercourses and the pipeline will not prevent the removal of structures in the future. - For trenchless crossings, the pipeline will be sufficiently buried below the bed of watercourses so future morphological diversity improvements can be implemented. - For open-cut crossings, the bed and banks of the watercourses would be reinstated as per baseline conditions.

Tier 2 Pressures	Tier 3 Pressures	Justification
		- The pipeline will be sufficiently buried below bed level. The bed and banks of watercourses would be reinstated as per baseline following open-cut crossings. No further impacts to connectivity is proposed and the buried pipeline depth would not prevent the watercourse from being reconnected to its floodplain. - The pipeline would be buried 1.2m below bed level and therefore future bank improvements would not be prevented by the pipeline. - There are no changes to existing culverts proposed as part of the Project.
Navigation	- Modify vessel design - Vessel Management - Boats in central track	- The impact of the permanent development in operation will not affect the ability to implement and sustain measures addressing navigation. - The construction phase will be of limited duration and limited spatial extent and is likely to have minimal impact on the navigation measures. - No changes proposed to navigable channels.
Education	- Invasive species awareness - Boat wash awareness - Educate landowners	The Project would not prevent the education of landowners, boat wash awareness or invasive species awareness mitigation measures from being maintained or implemented.
Water management	Align and attenuate flow	- The impact of the permanent development in operation will not affect the ability to implement and sustain measures addressing water management. - The construction phase will be of limited duration and limited spatial extent and likely to have minimal impact on the water management measures. - No changes are proposed to regulated flows.

6.6 Detailed WFD Assessment

- 6.6.1 Following on from the scoping assessment, the activities and WFD water bodies identified to require further assessment are considered here against the identified embedded environmental measures.
- 6.6.2 This section provides a summary of findings, including consideration of both the WFD requirement for no deterioration in WFD class and the need to ensure the Project does not prevent the achievement of future target status.
- 6.6.3 As the design of the Project, in many cases, is not proposed to vary significantly from waterbody to waterbody, the approach adopted here provides one generic assessment for each activity/infrastructure type per waterbody category (i.e. river, canal, transitional, groundwater) with generic mitigation which is appropriate for all water bodies of that class. For water bodies which have been identified to have specific sensitivities which require specific mitigation, these are set out.
- 6.6.4 Based on the screening and scoping assessment presented in **Sections 4 and 5**, those water bodies that have been identified as not requiring detailed assessment are not considered here.
- 6.6.5 The screening and scoping of activities/infrastructure types that was undertaken in **Section 4 and 5** did not include a consideration of any embedded environmental measures that would be implemented as part of the Project. However, in practice these measures would be incorporated to manage any potential effects on the water environment to an acceptable level.
- 6.6.6 **Table 7E.19 to Table 7E.26** present an assessment of each project activity with the inclusion of the embedded environmental measures and assess the likelihood of there being any effect on the WFD elements of the scoped in WFD waterbody groups.
- 6.6.7 In order to assess the magnitude of change, an approach has been taken to be consistent with the assessment of effects in **Chapter 7: Water Environment**. The magnitude of change from baseline conditions includes consideration of the duration and reversibility of the change, relevant legislation, policy standards and guidance.
- 6.6.8 Magnitude of effect may be either positive or negative. The criteria and examples in **Table 7E.20** focus on negative effects, but positive effects may also occur and are considered on a case-by-case basis as required.

Table 7E.19 Definitions of magnitude of effect

Magnitude	Examples
High	Deterioration in river flow regime, morphology or water quality, leading to sustained, permanent or long-term or non-temporary downgrading (deterioration) of WFD Surface Waterbody Status (including downgrading of individual WFD elements), or resulting in the inability of the surface waterbody to attain Good Ecological Potential as well as Good Ecological Status by the relevant deadline in line with the measures identified in the RBMP. Deterioration in groundwater levels, flows or water quality, leading to non-temporary downgrading of WFD Ground waterbody Status, or the inability of the Ground waterbody to attain Good Status in line with the measures identified in the RBMP.
Medium	Deterioration in river flow regime, morphology or water quality, leading to periodic, short-term and reversible, or potential temporary downgrading of Surface Waterbody Status (including potential temporary downgrading of individual WFD elements), although not affecting the ability of the surface waterbody to achieve future WFD objectives. Deterioration in groundwater levels, flows or water quality, leading to potential temporary downgrading of WFD Ground waterbody Status, although not affecting the ability of the Ground waterbody to achieve future WFD objectives.
Low	Measurable effect on river flow regime, morphology or water quality with no short-term or permanent change to WFD Surface Waterbody Status (of overall Status or element Status). Measurable effect on groundwater levels, flows or water quality, but with no short-term or permanent downgrading of WFD Ground waterbody Status.
Negligible	No measurable effect on river flow regime, morphology or water quality, and no consequences in terms of Surface Waterbody Status. No measurable effect on groundwater levels, flows or water quality, and no consequences in terms of WFD Ground waterbody Status.

Table 7E.20 Impact assessment for pipeline corridor laying

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures*	Assessment of effects on WFD
River water bodies – - Sinderland Brook (GB112069060980), Whittle Brook (Mersey Estuary) (GB112069060990), Sutton Brook (GB112069061170) - Weaver (Dane to Frodsham) (GB112068060500), - Mersey/ Manchester Ship Canal (Irwell/Manchester Ship Canal to Bollin) (GB112069061011) - River Weaver (Barnet to Valley Brook) (GB112068060461), River Weaver (Valley Brook to Winsford Flashes) (GB112068060462) - River Weaver (Winsford Flashes to Dane) (GB112068060463), Bollin (Ashley Mill to Manchester Ship Canal) (GB112069061382) - Dane (Wheelock to Weaver) (GBGB112068060470), Gale Brook (GB112068060430), Puddinglake Brook (GB112068060220) - Bogart Brook (GB112068060540), Cuddington Brook (Source to Crowton Brook) (GB112068060480), Wade Brook (GB112068060370) - Peckmill Brook, Hoolpool Gutter at Ince Marshes. Waterbody (GB112068060330), Arley Brook (Source to Gale Brook) (GB112068060420) - Keckwick Brook (GB112068060520), Cogshall Brook (GB112068060510), - Mersey (Bollin confluence to Howley Weir) including Padgate Brook (GB112069061012), Hardshaw (Windle) Brook (GB112069061210)			
Hydromorphological Supporting Elements	Quantity and dynamics of flow	D-1 Underground pipeline D-5 Management of subsurface flow pathways C-2 A Drainage and Water Management Plan (DWMP)	Any dewatering requirements to facilitate the necessary conditions for pipeline installation would be of shallow depth and low volume (typically dewatering would not take place at one individual location for more than several days) such that there would be Negligible effects on adjacent watercourse baseflow. Should the low quantities of dewatered groundwater be discharged to an adjacent

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures*	Assessment of effects on WFD
		C-4 Diversion and reinstatement of existing drainage networks C-6 Temporary provision of surface water drainage for construction areas C-7 Management of dewatering excavations C-10 Timely reinstatement following completion of works C-11 Permitting of discharges	watercourse any effects on the baseline flow volume would be low to Negligible, depending on the size of the watercourse relative to the volumes discharged. The Drainage Management Plan will ensure that all surface water runoff associated with pipeline corridor laying is managed using Sustainable Drainage Systems (SuDS) principles to ensure surface runoff is managed and discharge volumes are limited to greenfield rates, ensuring Negligible change in the surface runoff to water bodies. Considering the scale and duration of these activities in the context of WFD waterbody size and the RBMP reporting timescales, there is a high degree of confidence that the localised and short duration changes in the quantity and dynamics of flow would have a no impact on WFD Waterbody Status. Following the implementation of the embedded environmental measures, there would be a Low magnitude of effect on quantity and dynamics of flow. However, this would be for a very short duration and would be fully reversible. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Hydromorphological Supporting Elements	River continuity	None required	There would no effects on river continuity as there would be no in-channel works associated with this proposed activity.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures*	Assessment of effects on WFD
	(lateral and longitudinal)		
Hydromorphological Supporting Elements	River width and depth variation	None required	There would no effects on river width and depth variation as there would be no in-channel works associated with this proposed activity.
Hydromorphological Supporting Elements	Structure and substrate of the river bed	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design	The embedded environmental measures designed to prevent silty runoff from entering watercourses will ensure that there is minimal change to the sediment load entering watercourses and therefore there would be Negligible effect on the structure and substrate of the river bed.
Hydromorphological Supporting Elements	Connectivity with groundwater	D-5 Management of subsurface flow pathways C-4 Diversion and reinstatement of existing drainage networks	The works associated with pipeline corridor laying in floodplains and/or adjacent to watercourses would not result in any significant alteration of the connectivity of river and groundwater bodies, as there would be no in-channel works or structures introduced to the channel boundary.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures*	Assessment of effects on WFD
		C-7 Management of dewatering excavations C-8 Silt management measures	Embedded silt management measures to prevent silty runoff from reaching the channel will ensure that there is no change in the composition of the channel substrate which may reduce connectivity. The implementation of clay stanks or cross-drainage along the route of the trench would prevent significant alteration to the existing groundwater flow patterns. Furthermore, any dewatering requirements to facilitate the necessary conditions for pipeline installation would be of shallow depth, low volume and short duration such that there would be no effects on adjacent watercourse baseflow. Following the implementation of the embedded environmental measures, there would be a Negligible magnitude of effect on connectivity with groundwater. There would therefore be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Physico-chemical quality elements Chemical quality elements	Ammonia (Phys-Chem) Phosphate Dissolved oxygen Temperature	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas	Impacts on the existing baseline water quality could occur via the disturbance of contaminated sediments during pipeline laying activities leading to them being washed into watercourses via runoff. It could also potentially occur as a result of the short-term soil stockpiling alongside the pipeline corridor adjacent to watercourses. Considering the embedded environmental measures put in place to manage silty runoff reaching watercourses and the scale and duration of any effects in the context of WFD

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures*	Assessment of effects on WFD
	Specific Pollutants, Priority substances and Priority Hazardous substances	C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-17 Measures to avoid pollution impacts from disturbance of contaminated land (Materials Management Plan, MMP) C-13 A Pollution Prevention Plan (PPP) C-14 Storage or hydrocarbons and other chemicals C-15 Refuelling, inspection and maintenance C-18 Treatment and discharge of contaminated groundwater C-19 A monitoring and inspection programme	waterbody size, there is a high degree of confidence that the effects of these localised and short duration changes on water quality would be of Low magnitude and would not impact on WFD Waterbody Status. Direct effects, specifically on WFD Chemical Status, could occur as a result of accidental spillage or leakage of Polycyclic Aromatic Hydrocarbons (PAHs) associated with vehicle/machinery fuels and oils, or metals (from machinery itself) at or adjacent to the location of the pipeline route. Whilst the embedded environmental measures relating to pollution prevention and remediation are expected to manage the occurrence of such effects as far as practicable, small residual effects (e.g. slow/gradual leaks directly into or adjacent to the watercourse) cannot be discounted. However, considering the scale and duration of any effects in the context of WFD waterbody size, there is a high degree of confidence that the effects of localised and short duration changes in water quality would have a Low effect and therefore not impact on WFD Waterbody Status. Following the implementation of the embedded environmental measures, there would be a Negligible to Low magnitude of effect on physico-chemical and chemical quality elements. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures*	Assessment of effects on WFD
Biological quality elements	Fish, Eels, macrophytes and phytobenthos, and invertebrates	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-13 A Pollution Prevention Plan (PPP)	Potential effects from pipeline laying on biological quality elements would be primarily associated with changes to the hydromorphology and/or water quality of a watercourse that collectively make up the habitat upon which fish, macrophytes, phytobenthos and invertebrates are dependent. The main potential effect would be specifically related to the ingress of sediments from excavations and any short-term soil stockpiling to watercourses, ingress of potentially polluting substances from plant and machines and the removal of riparian habitat. This could result in a short term pulse of sediments downstream or changes in baseline water quality as a result of potentially polluting materials, which could in turn harm the habitats of fish, macrophytes and phytobenthos, and invertebrates. However, the embedded environmental measures in place to manage silty runoff and prevent spills will prevent this from occurring as much as is practicable. The effect is therefore Negligible. Following the implementation of the embedded environmental measures, there would be a Negligible effect associated with pipeline corridor laying. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Groundwater bodies – Wirral and West Cheshire Permo-Triassic Sandstone Aquifers (GB41101G202600) Weaver and Dane Quaternary Sand and Gravel Aquifers (GB41202G991700)			

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures*	Assessment of effects on WFD
- Manchester and East Cheshire Permo-Triassic Sandstone Aquifers (GB41201G101100) - Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers (GB41201G101700) - Sankey and Glaze Carboniferous Aquifers (GB41202G100100)			
Groundwater level elements	Quantitative dependent surface waterbody Status	D-1 Management of subsurface flow pathways C-2 A Drainage and Water Management Plan (DWMP) C-5 Private abstraction risk assessment and mitigation strategy C-7 Management of dewatering of excavations C-11 Permitting of discharges	During pipeline corridor laying, trenches may require dewatering to remove shallow inflows of groundwater. The trench itself would be shallow and therefore the volumes of water to be dewatered would be Negligible compared to the size of the WFD groundwater bodies and the impacts would be localised and temporary. Additionally, small volumes of groundwater would be dewatered in comparison to the scale of the Waterbody and therefore of Negligible effect.
Groundwater chemical elements	General chemical test	C-1 Code of Construction Practice C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-7 Management of dewatering of excavations	Earth movements during excavation have the potential to re-mobilise contaminants and, if a suitable pathway exists, contaminate groundwater. There is also the potential that removal of superficial materials in the trench could create pathways to shallow aquifers. However, potential effects will be mitigated by embedded good practice construction methods (such as the Materials Management Plan, Unexpected Contamination Protocol and a Pollution Prevention Plan) to prevent deterioration in

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures*	Assessment of effects on WFD
		C-11 Permitting of discharges C-13 A Pollution Prevention Plan (PPP) C-14 Storage or hydrocarbons and other chemicals C-15 Refuelling, inspection and maintenance C-16 Handling and processing of concrete C-17 Measures to avoid pollution impacts from disturbance of contaminated land (Materials Management Plan, MMP) C-18 Treatment and discharge of contaminated groundwater C-19 A monitoring and inspection programme	Status due to contamination of aquifers. It can therefore be considered that the risk would be low and the effect would also be low. Following implementation of embedded environmental measures, this effect is considered to be of Low magnitude and unlikely to cause a deterioration in Chemical Status for WFD groundwater bodies.
Non reportable waterbodies			
Hydromorphological Supporting Elements	Quantity and dynamics of flow	D-1 Underground pipeline D-5 Management of subsurface flow pathways	Any dewatering requirements to facilitate the necessary conditions for pipeline installation would be of shallow depth and low volume (typically dewatering would not take place at one individual location for more than several

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures*	Assessment of effects on WFD
		C-2 A Drainage and Water Management Plan (DWMP) C-4 Diversion and reinstatement of existing drainage networks C-6 Temporary provision of surface water drainage for construction areas C-7 Management of dewatering excavations C-10 Timely reinstatement following completion of works C-11 Permitting of discharges	days) such that there would be Negligible effects on adjacent watercourse baseflow. Should the low quantities of dewatered groundwater be discharged to an adjacent watercourse any effects on the baseline flow volume would be Low to Negligible, depending on the size of the watercourse relative to the volumes discharged. The Drainage Management Plan will ensure that all surface water runoff associated with pipeline corridor laying is managed using SuDS principles to ensure surface runoff is managed and discharge volumes are limited to greenfield rates, ensuring Negligible effect. Considering the scale and duration of these activities in the context of waterbody size and the RBMP reporting timescales, there is a high degree of confidence that the localised and short duration changes in the quantity and dynamics of flow would have a Negligible to Low effect with no impact on WFD Waterbody Status.
Hydromorphological Supporting Elements	River continuity (lateral and longitudinal)	None required	There would be no effects on river continuity as there would be no in-channel works associated with this proposed activity.
Hydromorphological Supporting Elements	River width and depth variation	None required	There would be no effects on river width and depth variation as there would be no in-channel works associated with this proposed activity.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures*	Assessment of effects on WFD
Hydromorphological Supporting Elements	Structure and substrate of the river bed	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design	The measures designed to prevent silty runoff from entering watercourses will ensure that there is minimal change to the sediment load entering watercourses and therefore there would be a Negligible effect on the structure and substrate of the river bed.
Hydromorphological Supporting Elements	Connectivity with groundwater	D-5 Management of subsurface flow pathways C-4 Diversion and reinstatement of existing drainage networks C-7 Management of dewatering excavations C-8 Silt management measures	The works associated with pipeline corridor laying in floodplains and/or adjacent to watercourses would not result in any significant alteration of the connectivity of river and groundwater bodies, as there would be no in-channel works or structures introduced to the channel boundary. Embedded silt management measures to prevent silty runoff from reaching the channel would ensure that there is no change in the composition of the channel substrate which may reduce connectivity. The implementation of clay stanks or cross-drainage along the route of the trench would prevent significant alteration to the existing groundwater flow patterns. Furthermore, any

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures*	Assessment of effects on WFD
			dewatering requirements to facilitate the necessary conditions for pipeline installation would be of shallow depth, low volume and short duration such that there would be no effects on adjacent watercourse baseflow. Following the implementation of the embedded environmental measures, there would be a Negligible effect on connectivity with groundwater. There would therefore be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Physico-chemical quality elements Chemical quality elements	Ammonia (Phys-Chem) Phosphate Dissolved oxygen Temperature Specific Pollutants, Priority substances and Priority Hazardous substances	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-17 Measures to avoid pollution impacts from disturbance of contaminated	Impacts on the existing baseline water quality could occur via the disturbance of contaminated sediments during pipeline laying activities leading to them being washed into watercourses via runoff. It could also potentially occur as a result of the short-term soil stockpiling alongside the pipeline corridor adjacent to watercourses or from the release of potentially polluting material (such as PAH for vehicle/plant fuels). Considering the embedded environmental measures put in place to manage silty runoff reaching watercourses and the pollution prevention measures and the scale and duration of any effects in the context of WFD waterbody size, there is a high degree of confidence that the effects of these localised and short duration changes on water quality would be of Low magnitude and would have no impact on WFD Waterbody Status.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures*	Assessment of effects on WFD
		land (Materials Management Plan, MMP) C-13 A Pollution Prevention Plan (PPP) C-14 Storage or hydrocarbons and other chemicals C-15 Refuelling, inspection and maintenance C-18 Treatment and discharge of contaminated groundwater C-19 A monitoring and inspection programme	Considering the implementation of the embedded environmental measures, there would be a Low effect associated with physico-chemical and chemical quality elements. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Biological quality elements	Fish, Eels, macrophytes and phytobenthos, and invertebrates	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures	Potential effects from pipeline laying on biological quality elements would be primarily associated with changes to the hydromorphology and/or water quality of a watercourse that collectively make up the habitat upon which fish, macrophytes, phytobenthos and invertebrates are dependent. The main potential effect would be specifically related to the ingress of sediments from excavations and any short-term soil stockpiling to watercourses. This could result in a short-term pulse of sediments downstream, which could in turn harm the habitats of fish, macrophytes and phytobenthos, and invertebrates. However, the embedded environmental

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures*	Assessment of effects on WFD
		C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-13 A Pollution Prevention Plan (PPP)	measures in place to manage silty runoff will prevent this from occurring as much as is practicable, meaning the effect is expected to be Negligible. Furthermore, there is potential for pollutants to enter the waterbody, also having the potential to negatively impact biological quality elements. However, the pollution prevention measures are deemed sufficient to mitigate this risk and prevent any deterioration of water quality and therefore biological quality. Following the implementation of embedded environmental measures and the scale and duration of any effects in the context of WFD waterbody size, there is a high degree of confidence that the effects of these localised and short duration changes on biological quality elements would be Negligible and would not have any impact on WFD Waterbody Status.

* described further in **Chapter 7: Water Environment**

Table 7E.21 Impact assessment for hydrostatic testing

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures*	Assessment of effects on WFD
River water bodies – Weaver (Dane to Frodsham) (GB 112068060500), River Weaver (Winsford Flashes to Dane) (GB112068060463)			
Hydromorphological Supporting Elements	Quantity and dynamics of flow	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-11 Permitting of discharges C-12 Discharge outfall design C-8 Silt management measures C-21 Pre-commissioning pipeline testing	Hydrostatic testing of the pipeline will involve water being sourced, used for testing and then discharged. While the overall volume of water required may be substantial, only small sections of the pipeline will be tested at any one time, limiting the volumes required for each test, thereby minimising any impact. All water will be sourced and discharged in accordance with Environment Agency Permits and it will therefore be ensured that the effect is Low and will only result in a one-time effect on each waterbody, with no long-term effect on the baseline. Considering the scale and temporary duration of these activities in the context of WFD waterbody size, the RBMP reporting timescales and the embedded environmental measures, there is a high degree of confidence that the localised and short duration changes in the quantity and dynamics of flow would be of Low magnitude of effect and would have no impact on WFD Waterbody Status. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Hydromorphological Supporting Elements	River continuity (lateral and longitudinal)	None required	There would no effects on river continuity as there would be no in-channel works associated with this proposed activity.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures*	Assessment of effects on WFD
Hydromorphological Supporting Elements	River width and depth variation	None required	There would no effects on river width and depth variation as there would be no in-channel works associated with this proposed activity.
Hydromorphological Supporting Elements	Structure and substrate of the river bed	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-12 Discharge outfall design C-21 Pre-commissioning pipeline testing	Test water will be discharged into waterbodies following use which has the potential to scour the river bed. This will be mitigated through a discharge system which dissipates any energy of the water and controls scour at the point of discharge. Following the implementation of the embedded environmental measures, there would be a Negligible effect on the substrate and structure of the river bed. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Hydromorphological Supporting Elements	Connectivity with groundwater	D-5 Management of subsurface flow pathways C-21 Pre-	Water to be abstracted and discharged for hydrostatic conditions will be of low volume and short duration such that there would be no effects on adjacent watercourse baseflow. In addition, the maximum discharge rate of 10% of flow in the channel will be maintained.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures*	Assessment of effects on WFD
		commissioning pipeline testing	Following the implementation of the embedded measures, there would be a Negligible effect in connectivity with groundwater. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Physico-chemical quality elements Chemical quality elements	Ammonia (Phys-Chem) Phosphate Dissolved oxygen Temperature Specific Pollutants, Priority substances and Priority Hazardous substances	Generic embedded measures C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-8 Silt management measures C-12 Discharge outfall design C-13 A Pollution Prevention Plan (PPP) C-14 Storage or hydrocarbons and other chemicals C-15 Refuelling, inspection and maintenance	Generic assessment of effects There is the potential for water being discharged into the waterbodies to impact on the physico-chemical and chemical status of the receiving waterbody. However, water quality (including the level of oxygen) in the discharge water will be monitored before discharge, and it will be treated and oxygenated if needed. Following the implementation of the embedded environmental measures, there would be a Negligible to Low effect associated with physico-chemical and chemical quality elements. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures*	Assessment of effects on WFD
		C-19 A monitoring and inspection programme C-21 Pre-commissioning pipeline testing	
Biological quality elements	Fish, Eels, macrophytes and phytobenthos, and invertebrates	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-12 Discharge outfall design C-13 A Pollution Prevention Plan (PPP) C-21 Pre-commissioning pipeline testing	There is potential for fish entrainment during water abstraction. Suitable screens will be used to mitigate this. Potential effects on biological quality elements may occur due to impacts in water quality. However, the water quality (including level of oxygen in the water) will be monitored before discharge, and it will be oxygenated if needs be. Following the implementation of embedded environmental measures and the scale and duration of any effects in the context of WFD waterbody size, there is a high degree of confidence that the effects of these localised and short duration changes on biological quality elements would be of Low magnitude and would not impact on WFD Waterbody Status. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures*	Assessment of effects on WFD
Canal water bodies – Bridgewater Canal (GB71210001) Weaver Navigation (canal section Frodsham to Weston Point Docks) (GB71210545)			
Physico-chemical quality elements Chemical quality elements	Ammonia (Phys-Chem) Phosphate Dissolved oxygen Temperature Specific Pollutants, Priority substances and Priority Hazardous substances	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-8 Silt management measures C-12 Discharge outfall design C-13 A Pollution Prevention Plan (PPP) C-14 Storage or hydrocarbons and other chemicals C-15 Refuelling, inspection and maintenance C-19 A monitoring and inspection programme C-21 Pre-commissioning pipeline testing	Water will be abstracted from the canal waterbodies. This will not be in significant enough quantities to affect canal water quality through reducing dilution. There is the potential for water being discharged into the canal waterbodies to impact on their physico-chemical and chemical status. However the level of oxygen in the water will be monitored before discharge, and it will be oxygenated if needs be. Water quality monitoring will also be undertaken before discharge. In addition, the maximum discharge rate of 10% of flow in the channel will be maintained. Following the implementation of the embedded environmental measures, there would be a Negligible to Low effect associated with physico-chemical and chemical quality elements. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures*	Assessment of effects on WFD
Transitional water bodies – Mersey (GB531206908100)			
Water Quality	Phytoplankton	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-8 Silt management measures C-12 Discharge outfall design C-13 A Pollution Prevention Plan (PPP) C-14 Storage or hydrocarbons and other chemicals C-15 Refuelling, inspection and maintenance C-19 A monitoring and inspection programme C-21 Pre-commissioning pipeline testing	Water will be abstracted from the Mersey. This will however not be in significant enough quantities to affect canal water quality through reducing dilution. There is the potential for water being discharged into the Mersey to impact on the physico-chemical and chemical status which may affect phytoplankton. However, the level of oxygen in the water will be monitored before discharge, and it will be oxygenated if needs be. Water quality monitoring will also be undertaken before discharge. In addition, the maximum discharge rate of 10% of flow in the channel will be maintained. Following the implementation of the embedded environmental measures, there would be a Negligible to Low effect associated with water quality receptors. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures*	Assessment of effects on WFD
Hydromorphology		C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-11 Permitting of discharges C-12 Discharge outfall design C-8 Silt management measures C-21 Pre-commissioning pipeline testing	Hydrostatic testing of the pipeline will involve water being sourced, used for testing and then discharged. While the overall volume of water required may be substantial, only small sections of the pipeline will be tested at any one time, limiting the volumes required for each test, thereby minimising any impact. All water will be sourced and discharged in accordance with Environment Agency Permits. The relative size of the Mersey, the tidal influence and embedded environmental measures will mean that the relatively small quantities of water abstracted will have a Negligible impact on hydromorphology. Considering the scale and duration of these activities in the context of the Mersey WFD waterbody size and the RBMP reporting timescales, there is a high degree of confidence that the localised and short duration changes in the quantity and dynamics of flow will have a Negligible effect on hydromorphology receptors.
Biological receptors	Higher sensitivity habitats Fish movement, migration or spawning Phytoplankton WFD Protected areas	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface	There is potential for fish entrainment during water abstraction. Suitable screens will be used to mitigate this. Potential effects on biological receptors may occur due to impacts on water quality. However, the level of oxygen in the water will be monitored before discharge, and it will be oxygenated if needs be. Water quality monitoring will also be undertaken before discharge.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures*	Assessment of effects on WFD
		water drainage for construction areas C-8 Silt management measures C-12 Discharge outfall design C-13 A Pollution Prevention Plan (PPP) C-21 Pre-commissioning pipeline testing	This activity is not expected to impact higher sensitivity habitats or WFD protected areas. Following the implementation of embedded environmental measures and the scale/duration of any effects in the context of WFD waterbody size, there is a high degree of confidence that the effects of these localised and short duration changes on biological quality elements would be Negligible.

* described further in **Chapter 7: Water Environment**

Table 7E.22 Impact assessment for pipeline corridor watercourse crossings – open-cut

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
River water bodies – - Sinderland Brook (GB112069060980), Whittle Brook (Mersey Estuary) (GB112069060990), Sutton Brook (GB112069061170), - Weaver (Dane to Frodsham) (GB112068060500), - Mersey/ Manchester Ship Canal (Irwell/Manchester Ship Canal to Bollin) (GB112069061011) - River Weaver (Barnet to Valley Brook) (GB112068060461), River Weaver (Valley Brook to Winsford Flashes) (GB112068060462) - River Weaver (Winsford Flashes to Dane) (GB112068060463), Bollin (Ashley Mill to Manchester Ship Canal) (GB112069061382) - Dane (Wheelock to Weaver) (GB112068060470), Gale Brook (GB112068060430), Puddinglake Brook (GB112068060220) - Bogart Brook (GB112068060540), Cuddington Brook (Source to Crowton Brook) (GB112068060480), Wade Brook (GB112068060370) - Peckmill Brook, Hoolpool Gutter at Ince Marshes. Waterbody (GB112068060330), Arley Brook (Source to Gale Brook) (GB112068060420) - Keckwick Brook (GB112068060520), Cogshall Brook (GB112068060510), - Mersey (Bollin confluence to Howley Weir) including Padgate Brook (GB112069061012), Hardshaw (Windle) Brook (GB112069061210)			
Hydromorphological Supporting Elements	Quantity and dynamics of flow	D-5 Management of subsurface flow pathways C-2 A Drainage and Water Management Plan (DWMP) C-4 Diversion and reinstatement of existing drainage networks	Generic assessment of effects Any dewatering requirements to facilitate the necessary conditions for pipeline installation would be of shallow depth and low volume (both depending on ground conditions, but a typical depth of 2 to 3m to the base of the trench is assumed) and short duration (typically dewatering would not take place at one individual location for more than

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
		C-6 Temporary provision of surface water drainage for construction areas C-7 Management of dewatering excavations C-10 Timely reinstatement following completion of works C-11 Permitting of discharges	several days) such that there would be only a Low magnitude temporary effect on adjacent watercourse baseflow. Should the low quantities of dewatered groundwater be discharged to an adjacent watercourse, any effects on the baseline flow volume would also be Low and temporary. The installation of open-cut watercourse crossings via fluming or damming would only occur on relatively minor watercourses and would not be used for any WFD river water bodies with the exception of the Puddinglake and Hornsmill Brooks (see below). The trenching process would lead to a period of flow regime alteration for a localised extent up and downstream of the crossing location, However, this process will be brief, being completed in the short term, and therefore while these local alterations to the quantity and dynamics of flow are not insignificant, however the effects would be fully reversible once the flow is re-connected following pipeline installation, meaning the magnitude of effect would be Low. Additionally, the fluming of flow would maintain flows downstream of the works location. Once the pipelines are installed, the quantity of water within the channel and morphological conditions of the channel cross-section would be re-established. The baseline quantity and dynamics of flow would therefore be restored.

Water Framework
Directive (WFD)
element

WFD sub-
element

Embedded environmental
measures *

Assessment of effects on WFD

Considering the scale and duration of these activities in the context of WFD waterbody size, the RBMP reporting timescales, and embedded environmental measures there is a high degree of confidence that the localised and short duration changes in the quantity and dynamics of flow would have a **Low** effect and would not result in any change in WFD Waterbody Status.

Specific assessment of effects

There are two WFD rivers which will be crossed with open-cut methods, Puddinglake Brook and Hornsmill Brook (within the Peckmill Brook WFD waterbody). Both rivers have not been assigned a high conservation score with values of 3 and 6 respectively. Puddinglake Brook is only up to 2m wide at this location and Hornsmill Brook is artificially straightened, entrenched with embankments reducing its connection to its floodplain. The duration of open-cut works will be short, with all flow pumped or flumed over the working area to minimise impacts to flows downstream. Following pipeline laying the crossing will be restored to its baseline condition and there will be no long-term impacts. Therefore, given the short and localised duration and scale and the implementation of embedded environmental measures, impacts at the waterbody scale are not anticipated on either waterbody and the effect will be of **Low** magnitude, with no impact on WFD waterbody Status.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
Hydromorphological Supporting Elements	River continuity (lateral and longitudinal)	C-9 Stand-off distances from watercourses C-25 A Watercourse Crossing Plan (WCP) C-27 Trenched crossings of minor watercourses C-10 Timely reinstatement following completion of works	Generic assessment of effects While damming or fluming associated with open-cut crossings would present a barrier to longitudinal connectivity, the works will be brief and are only proposed to occur on minor watercourses. During this time water would be overpumped or flumed across the excavation and therefore there would still be hydraulic conductivity downstream. There would be an impact on ecological and sediment connectivity, however this would be temporary and the channel would be fully restored after the pipeline has been laid beneath the crossing location, therefore the magnitude of effect is considered to be Low. The construction works to facilitate pipeline watercourse crossings would not result in any permanent reduction in the lateral connectivity of river flow and the adjacent floodplain, as the topsoil and sediment that is removed in the trenching process would be reinstated on completion of the pipeline installation. Similarly, the interruption of longitudinal river continuity as a result of the temporary damming and overpumping of water (for a short term period only) would be fully reversed on completion of pipeline installation. Considering the scale and duration of these activities in the context of WFD waterbody size, the RBMP reporting timescales, and the implementation of embedded environmental measures, the magnitude of effects would be

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
			Low and there is a high degree of confidence that the effects of these localised changes in the river continuity would not have any impact on WFD Waterbody Status. Specific assessment of effects There are two WFD rivers which will be crossed with open-cut methods, Puddinglake Brook and Hornsmill Brook (within the Peckmill Brook WFD waterbody). Both rivers have not been assigned a high conservation score with values of 3 and 6 respectively. Puddinglake Brook is only up to 2m wide at this location and Hornsmill Brook is artificially straightened, entrenched, with embankments reducing its connection to its floodplain, having poor lateral connectivity. The duration of open-cut works will be very short, with all flow pumped or flumed over to the works which will have an impact on longitudinal connectivity but only for a short duration. Following pipeline laying the crossing will be restored to its baseline situation and all banks returned to the previous state ensuring there will be no long-term impacts. Therefore, there will be a temporary effect on lateral and longitudinal connectivity, but this will be of a very short duration and the magnitude of effect will be Low with no impact on WFD waterbody Status.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
Hydromorphological Supporting Elements	River width and depth variation	C-27 Trenched crossings of minor watercourses C-10 Timely reinstatement following completion of works	Generic assessment of effects The construction works to facilitate open-cut crossings would result in no perceptible alteration of the baseline river width and depth variation as the sediment and cross-sectional form that is removed in the trenching process would be reinstated on completion of the pipeline installation (with works being brief). The crossings would have the working width reduced as far as is practicable. Considering the scale and duration of these activities in the context of WFD waterbody size and the RBMP reporting timescales, there is a high degree of confidence that the effects of these localised changes in the river width and depth variation would not have any effect on WFD Waterbody Status. Following the implementation of the embedded environmental measures, there would be a Low magnitude of effect on river width and depth variation. Specific assessment of effects There are two WFD rivers which will be crossed with open-cut methods, Puddinglake Brook and Hornsmill Brook (within the Peckmill Brook WFD waterbody). Both rivers have not been assigned a high conservation score with values of 3 and 6 respectively. Hornsmill Brook is artificially straightened at the point of the crossing. The open-cut works will be temporary and of short duration.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
			Following pipeline laying the crossing will be restored to its baseline situation and all banks returned to the previous state ensuring there will be no long-term impacts on river width and depth. There will therefore be a temporary impact on river width and depth variation, but this will be of a very short duration and of a Low magnitude of effect with no impact on WFD Waterbody Status.
Hydromorphological Supporting Elements	Structure and substrate of the river bed	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-17 Measures to avoid pollution impacts from disturbance of contaminated land	Generic assessment of effects The construction works to facilitate open-cut watercourse crossings would result in no perceptible alteration of the substrate of the river bed as the sediment and cross-sectional form that is removed in the trenching process would be reinstated on completion of the pipeline installation. It is possible that, following the reconnection of watercourse flow once the pipeline is installed, there would be a minor pulse of fine-grained sediment transported downstream associated with any loose/unconsolidated sediment that remains following the covering of the trench. However, this is likely to be very short-lived and would be within the normal range of suspended sediment transport rates associated with natural bed/bank disturbance (e.g. small-scale bank erosion).

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
		(Materials Management Plan, MMP)	Considering the scale and duration of these activities in the context of WFD waterbody size, the RBMP reporting timescales and embedded environmental measures, there is a high degree of confidence that the effects of these localised changes in the structure and substrate of the river bed would be of a Low magnitude of effect and would not impact WFD Waterbody Status. Specific assessment of effects There are two WFD rivers which will be crossed with open-cut methods, Puddinglake Brook and Hornsmill Brook (within the Peckmill Brook WFD waterbody). Both rivers have not been assigned a high conservation score with values of 3 and 6 respectively and although the beds were not able to be observed at the crossing locations due to the presence of dense macrophytes and riparian vegetation. The open-cut works will be temporary and of short duration. Following pipeline laying the crossing will be restored to its baseline situation and all beds returned to the previous state ensuring there will be no long-term impacts on the structure and substrate of the river bed. Therefore, there will be a temporary impact on the structure and substrate of the river bed, but this will be of a very short duration and unlikely to impact at the waterbody scale, therefore the magnitude of effect is considered to be Low with no impact on WFD waterbody Status.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
Hydromorphological Supporting Elements	Connectivity with groundwater	D-5 Management of subsurface flow pathways C-4 Diversion and reinstatement of existing drainage networks C-7 Management of dewatering excavations C-8 Silt management measures C-27 Trenched crossings of minor watercourses	Generic assessment of effects Given the localised scale of the trenched underground pipeline installations (below the baseline river bed level) and the fact that the pipeline itself would not provide any perceptible alteration of the pathway from watercourses to the hyporheic zone, there is a high degree of confidence that any localised disturbance of the connectivity between watercourses and the underlying groundwater bodies would be of Negligible magnitude of effect. During trench excavation, the implementation of clay stanks or cross-drainage along the route of the trench would prevent significant alteration to the existing groundwater flow patterns. Considering the scale and duration of any effects in the context of WFD waterbody size (both river and groundwater), there is a high degree of confidence that the effects of these localised changes on the connectivity with groundwater would not have any effect on WFD Waterbody Status. Following the implementation of the embedded environmental measures, there would be a Negligible effect on connectivity with groundwater. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
Hydromorphological Supporting Elements	Structure of the riparian zone	C-27 Trenched crossings of minor watercourses	Generic assessment of effects The construction of open-cut crossings would require excavations within riparian areas for the purposes of pipeline laying. However, these would be of a limited width, and temporary duration and will be returned to their previous state upon completion of the works. As the disruption to narrow sections of the riparian zone on only some minor watercourses would only be temporary with the riparian zone reinstated to baseline conditions, the magnitude of effect is Low. Therefore, there is not expected to be any impact on WFD Status of the water bodies. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project. Specific assessment of effects There are two WFD rivers which will be crossed with open-cut methods, Puddinglake Brook and Hornsmill Brook (within the Peckmill Brook WFD waterbody). Both rivers have not been assigned a high conservation score with values of 3 and 6 respectively exhibiting low depth and width variation. Hornsmill Brook has no riparian zone with agricultural land abutting both embanked banktops. Puddinglake Brook does have a riparian strip on both banks at the crossing location. The duration of open-cut works will be very short. Following pipeline laying the crossing will be restored to its baseline

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
			situation and all banks and riparian areas planted and are anticipated to return to baseline conditions within 2 years. There will be a temporary Low magnitude of effect on the structure of the riparian zone with no impact on WFD Waterbody Status.
Physico-chemical quality elements Chemical quality elements	Ammonia (Phys-Chem) Phosphate Dissolved oxygen Temperature Specific Pollutants, Priority substances and Priority Hazardous substances	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-17 Measures to avoid pollution impacts from disturbance of contaminated land (Materials Management Plan, MMP)	Impacts on the existing baseline water quality could occur via the disturbance of contaminated sediments. This could be within the channel and / or on the river banks at the location of open-cut watercourse crossing locations. There is a risk where a short term 'pulse' of contaminated water quality could propagate downstream once the flow is reconnected following the completion of pipeline installation and the reinstatement of bed and bank materials. However, it could also potentially occur as a result of the short-term soil stockpiling alongside the trenched pipeline corridor adjacent to watercourses. Additionally, direct impacts, on WFD Chemical Status, could occur as a result of accidental spillage or leakage of PAHs associated with vehicle/machinery fuels and oils, or metals (from machinery itself) at or adjacent to the location of the pipeline watercourse crossing entering the watercourse via runoff. Following the embedded environmental measures to mitigate against the release of silty sediment into watercourses, pollution prevention plans and the scale and

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
		C-13 A Pollution Prevention Plan (PPP) C-14 Storage or hydrocarbons and other chemicals C-15 Refuelling, inspection and maintenance C-18 Treatment and discharge of contaminated groundwater C-19 A monitoring and inspection programme	duration of any effects in the context of WFD waterbody size, there is a high degree of confidence that the effects of these localised and short duration changes on water quality would be of Low magnitude of effect and would not impact on WFD Waterbody Status.
Biological quality elements	Fish, Macrophytes and phytobenthos, and invertebrates	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design	Generic assessment of effects Effects on biological quality elements are associated with changes to the hydromorphology and/or water quality of a watercourse that collectively make up the habitat upon which fish, macrophytes / phytobenthos and invertebrates are dependent, however in this instance there is also a direct loss of aquatic habitat during the crossing process. This would be of a temporary nature and would be reinstated following the completion of the crossing, so the magnitude of effect is Low. In addition, the construction of the crossing would cause a barrier to fish and eel migration. Further work would be required to identify the sensitive watercourses and ensure that construction timing takes this into account to minimise the impact. Construction timings

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
		C-13 A Pollution Prevention Plan (PPP)	will need to be programmed to avoid seasonal fish spawning/migration periods.
		Specific embedded measures 16 – Screening of pumps	Aquatic habitats may also be affected by the mobilisation of sediments from open-cut crossings and short-term soil stockpiling adjacent to the watercourses. This could result in a short-term pulse of sediments downstream, which could in turn harm the habitats of fish, macrophytes and phytobenthos, and invertebrates. This will be mitigated through the embedded silt prevention measures. With the potential for pollutants to enter the waterbody also having the potential to impact biological quality elements. However, pollution prevention measures are deemed sufficient to mitigate this risk and prevent any deterioration of water quality and therefore biological quality. Following implementation of embedded environmental measures and the scale and duration of any effects in the context of WFD waterbody size, there is a high degree of confidence that the effects of these localised and short duration changes on biological quality elements would have a Low magnitude of effect and would not have any impact on WFD Waterbody Status. Specific assessment of effects Where eels are known to be present, a suitable screen will be put in place on pumps where any overpumping is occurring to prevent a danger to the eels. These screens

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
			will be monitored for debris during the pumping operation. Screens will also be in place to mitigate entrainment or impingement of fish. The implementation of these specific measures will ensure that there is a Negligible to Low effect on fish and eels and this will be temporary and of short duration with no impact on WFD Waterbody Status.
		• Groundwater bodies - Wirral and West Cheshire Permo-Triassic Sandstone Aquifers (GB41101G202600), • Weaver and Dane Quaternary Sand and Gravel Aquifers (GB41202G991700), • Manchester and East Cheshire Permo-Triassic Sandstone Aquifers (GB41201G101100) • Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers (GB41201G101700) • Sankey and Glaze Carboniferous Aquifers (GB41202G100100)	
Groundwater Level elements	Quantitative dependent surface waterbody Status	D-1 Management of subsurface flow pathways C-2 A Drainage and Water Management Plan (DWMP) C-5 Private abstraction risk assessment and mitigation strategy C-7 Management of dewatering of excavations C-11 Permitting of discharges	During open-cut watercourse crossing methods may require dewatering to remove shallow inflows of groundwater. The trench itself would be shallow and therefore the volumes of water to be dewatered would be negligible compared to the size of the WFD groundwater bodies and the impacts would be localised and temporary. On this basis, considering the scale and duration of works in the context of WFD waterbody size, the RBMP reporting timescales and the embedded environmental measures, there is a high degree of confidence that any localised and short-duration changes in local groundwater levels would have a Negligible magnitude of effect which would not have any impact on WFD Waterbody Status.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
Groundwater chemical elements	General chemical test	C-1 Construction Environmental Management Plan C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-7 Management of dewatering of excavations C-11 Permitting of discharges C-13 A Pollution Prevention Plan (PPP) C-14 Storage or hydrocarbons and other chemicals C-15 Refuelling, inspection and maintenance C-16 Handling and processing of concrete C-17 Measures to avoid pollution impacts from disturbance of contaminated land (Materials Management Plan, MMP)	Earth movements during excavation have the potential to re-mobilise contaminants and, if a suitable pathway exists, contaminate groundwater. There is also the potential that the removal of superficial materials in the trench could create pathways to shallow aquifers. However, potential effects would be mitigated by embedded good practice construction methods (such as the Materials Management Plan, Unexpected Contamination Protocol and a Pollution Prevention Plan) to prevent deterioration in status, due to contamination of aquifers. Therefore, it can be considered that the risk would be Low and the magnitude of change would also be Low. Following implementation of embedded environmental measures, this magnitude of effect is considered to be Low and unlikely to cause a deterioration in Chemical Status for WFD groundwater bodies.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
		C-18 Treatment and discharge of contaminated groundwater C-19 A monitoring and inspection programme	
Non reportable water bodies			
Hydromorphological Supporting Elements	Quantity and dynamics of flow	D-5 Management of subsurface flow pathways C-2 A Drainage and Water Management Plan (DWMP) C-4 Diversion and reinstatement of existing drainage networks C-6 Temporary provision of surface water drainage for construction areas C-7 Management of dewatering excavations C-10 Timely reinstatement following completion of works C-11 Permitting of discharges	Any dewatering requirements to facilitate the necessary conditions for pipeline installation would be of shallow depth and low volume (both depending on ground conditions, but a typical depth of 2 to 3m to the base of the trench is assumed) and short in duration (typically dewatering would not take place at one individual location for more than several days) such that there would be only a low magnitude temporary effect on adjacent watercourse baseflow. Should the low quantities of dewatered groundwater be discharged to an adjacent watercourse, any effects on the baseline flow volume would also be low and temporary. The trenching process would lead to a period of flow regime alteration for a localised extent up and downstream of the crossing location, However, as this process will be brief and completed in the short term, whilst these local alterations to the quantity and dynamics of flow are not insignificant, the effects would be fully reversible once the flow is re-

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
			connected following pipeline installation, meaning the magnitude of effect would be Low. Once the pipelines are installed, the baseline quantity of water within the channel and morphological conditions of the channel cross-section would be re-established. Therefore, the baseline quantity and dynamics of flow would be restored. Considering the scale and duration of these activities in the context of WFD waterbody size, the RBMP reporting timescales and embedded mitigations, there is a high degree of confidence that the localised and short duration changes in the quantity and dynamics of flow would not have any impact on WFD Waterbody Status and there would be a Low magnitude of effect on quantity and dynamics of flow. However, this would be for a very short duration and would be fully reversible.
Hydromorphological Supporting Elements	River continuity (lateral and longitudinal)	C-9 Stand-off distances from watercourses C-25 A Watercourse Crossing Plan (WCP) C-27 Trenched crossings of minor watercourses	While damming or fluming associated with open-cut crossings would present a barrier to longitudinal connectivity, this would only be for a brief period and is only proposed to occur on minor watercourses. During this time, water would be over pumped or flumed across the excavation therefore maintaining downstream hydraulic connectivity. There would be an impact of ecological and sediment connectivity, however this would be temporary and the channel would be fully restored after the pipeline

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
			has been laid beneath the crossing location, therefore the magnitude of change is Low. The construction works to facilitate pipeline watercourse crossings would not result in any permanent reduction in the lateral connectivity of river flow and the adjacent floodplain, as the topsoil and sediment that is removed in the trenching process would be reinstated on completion of the pipeline installation. Considering the scale and duration of these activities in the context of WFD waterbody size, the RBMP reporting timescales and embedded mitigation, there is a high degree of confidence that the effects of these localised changes in the river continuity would not have any effect on WFD Waterbody Status and there would be a Low magnitude of effect on river continuity.
Hydromorphological Supporting Elements	River width and depth variation	C-27 Trenched crossings of minor watercourses	The construction works to facilitate open-cut crossings would result in no perceptible alteration of the baseline river width and depth variation as the sediment and cross-sectional form that is removed in the trenching process would be reinstated on completion of the pipeline installation (a period of less than two days duration). The crossings would have the working width reduced as far as is practicable.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
			Considering the scale and duration of these activities in the context of WFD waterbody size, the RBMP reporting timescales and embedded environmental measures, there is a high degree of confidence that the effects of these localised changes in the river width and depth variation would not have any impact on WFD Waterbody Status and there would be a Low magnitude of effect in river width and depth variation.
Hydromorphological Supporting Elements	Structure and substrate of the river bed	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-17 Measures to avoid pollution impacts from disturbance of contaminated land	The construction works to facilitate open-cut watercourse crossings would result in no perceptible alteration of the substrate of the river bed as the sediment and cross-sectional form that is removed in the trenching process would be reinstated on completion of the pipeline installation. It is possible that, following the reconnection of watercourse flow once the pipeline is installed, there would be a minor pulse of fine-grained sediment transported downstream associated with any loose/unconsolidated sediment that remains following the covering of the trench. However, this is likely to be very short-lived and would be within the normal range of suspended sediment transport rates associated with natural bed/bank disturbance (e.g. small-scale bank erosion). Considering the scale and duration of these activities in the context of WFD waterbody size and the RBMP reporting

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
		(Materials Management Plan, MMP)	timescales, there is a high degree of confidence that the effects of these localised changes in the structure and substrate of the river bed would not have any effect on WFD Waterbody Status. Following the implementation of the embedded environmental measures, there would be a Low magnitude of effect on the structure and substrate of the river bed. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Hydromorphological Supporting Elements	Connectivity with groundwater	D-5 Management of subsurface flow pathways C-4 Diversion and reinstatement of existing drainage networks C-7 Management of dewatering excavations C-8 Silt management measures C-27 Trenched crossings of minor watercourses	Given the localised scale of the trenched underground pipeline installations (below the baseline river bed level) and the fact that the pipeline itself would not provide any perceptible alteration of the pathway from watercourses to the hyporheic zone, there is a high degree of confidence that any localised disturbance of the connectivity between watercourses and the underlying groundwater bodies would be negligible. During trench excavation, the implementation of clay stanks or cross-drainage along the route of the trench would prevent significant alteration to the existing groundwater flow patterns. Considering the scale and duration of any effects in the context of WFD waterbody size (both river and groundwater), there is a high degree of confidence that the

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
			effects of these localised changes on the connectivity with groundwater would not have any effect on WFD Waterbody Status. Following the implementation of the embedded environmental measures, there would be a Negligible magnitude of effect in connectivity with groundwater. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Hydromorphological Supporting Elements	Structure of the riparian zone	C-27 Trenched crossings of minor watercourses	The construction of open-cut crossings would require excavations within riparian areas for the purposes of pipeline laying. However, these would be of a limited width, temporary duration and will be returned to their previous state upon completion of the works. As the disruption to narrow sections of the riparian zone on only some minor watercourses would only be temporary with the riparian zone reinstated to baseline conditions the magnitude of effect is Low. There is not expected to be any impact on WFD Status of the water bodies. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Physico-chemical quality elements	Ammonia (Phys-Chem) Phosphate	C-1 A Construction Environmental Management Plan (CEMP)	Impacts on the existing baseline water quality could occur via the disturbance of contaminated sediments. This could be within the channel and / or on the river banks at the location of open-cut watercourse crossing locations. There

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
Chemical quality elements	Dissolved oxygen Temperature	C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-17 Measures to avoid pollution impacts from disturbance of contaminated land (Materials Management Plan, MMP)	is a risk where a short term 'pulse' of contaminated water quality could propagate downstream once the flow is reconnected following the completion of pipeline installation and the reinstatement of bed and bank materials. However, it could also potentially occur as a result of the short-term soil stockpiling alongside the trenched pipeline corridor adjacent to watercourses. Following implementation of the embedded environmental measures to mitigate against the release of silty sediment into watercourses and the scale and duration of any effects in the context of WFD waterbody size, there is a high degree of confidence that the effects of these localised and short duration changes on water quality would not have any impact on WFD Waterbody Status.
	Specific Pollutants, Priority substances and Priority Hazardous substances	C-13 A Pollution Prevention Plan (PPP) C-14 Storage or hydrocarbons and other chemicals C-15 Refuelling, inspection and maintenance	Direct effects, specifically on WFD Chemical Status, could occur as a result of accidental spillage or leakage of PAHs associated with vehicle / machinery fuels and oils, or metals (from machinery itself) at or adjacent to the location of the pipeline watercourse crossing. Whilst the embedded environmental measures relating to pollution prevention and remediation are expected to manage the occurrence of such effects as far as practicable, small residual impacts (e.g. slow/gradual leaks directly into or adjacent to the watercourse) of low magnitude cannot be discounted. However, considering the scale and duration of any effects in the context of WFD waterbody size, there is a high degree of confidence that the effects of localised and short duration changes in water quality would be of Low

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
		C-18 Treatment and discharge of contaminated groundwater C-19 A monitoring and inspection programme	magnitude and would not have any effect on WFD Waterbody Status. Following the implementation of the embedded environmental measures, there would be only a Low magnitude of effect associated with water quality. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Biological quality elements	Fish, Macrophytes and phytobenthos, and invertebrates	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-13 A Pollution Prevention Plan (PPP)	Effects on biological quality elements are associated with changes to the hydromorphology and/or water quality of a watercourse that collectively make up the habitat upon which fish, macrophytes/phytobenthos and invertebrates are dependent, however in this instance, there is also a direct loss of aquatic habitat during the crossing process. This would be of a temporary nature and would be reinstated following the completion of the crossing, so the magnitude is Low. In addition, the construction of the crossing would cause a barrier to fish and eel migration. Further work would be required to identify the sensitive watercourses and ensure that construction timing takes this into account to minimise the impact. Construction timings will need to be programmed to avoid seasonal fish spawning/migration periods. Aquatic habitats may also be affected by the mobilisation of sediments from open-cut crossings and short-term soil stockpiling adjacent to the watercourses. This could result

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
		Specific embedded measures 16 – Screening of pumps	in a short-term pulse of sediments downstream, which could in turn harm the habitats of fish, macrophytes and phytobenthos, and invertebrates. This will be mitigated through the embedded silt prevention measures. With the potential for pollutants to enter the waterbody also having the potential to negatively impact biological quality elements. However, the pollution prevention measures are deemed sufficient to mitigate this risk and prevent any deterioration of water quality and therefore biological quality. Following implementation of embedded environmental measures and the scale/duration of any effects in the context of WFD waterbody size, there is a high degree of confidence that the effects of these localised and short duration changes on biological quality elements would be of Low magnitude and would not have any impact on WFD Waterbody Status. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project. Specific assessment of effects Where eels are known to be present, a suitable screen will be put in place on pumps where any overpumping is occurring to prevent a danger to the eels. These screens will be monitored for debris during the pumping operation.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
			Screens will also be in place to mitigate entrainment or impingement of fish. The implementation of these specific measures will ensure that there is a Negligible to Low magnitude of effect on fish and eels and this will be temporary and of short duration.

* described further in **Chapter 7: Water Environment**

Table 7E.23 Impact assessment for pipeline corridor watercourse crossings – trenchless

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
River water bodies – - Sinderland Brook (GB112069060980), Whittle Brook (Mersey Estuary) (GB112069060990), Sutton Brook (GB112069061170) - Weaver (Dane to Frodsham) (GB112068060500), - Mersey/ Manchester Ship Canal (Irwell/Manchester Ship Canal to Bollin) (GB112069061011) - River Weaver (Barnet to Valley Brook) (GB112068060461), River Weaver (Valley Brook to Winsford Flashes) (GB112068060462) - River Weaver (Winsford Flashes to Dane) (GB112068060463), Bollin (Ashley Mill to Manchester Ship Canal) (GB112069061382) - Dane (Wheelock to Weaver) (GB112068060470), Gale Brook (GB112068060430), Puddinglake Brook (GB112068060220) - Bogart Brook (GB112068060540), Cuddington Brook (Source to Crowton Brook) (GB112068060480), Wade Brook (GB112068060370) - Peckmill Brook, Hoolpool Gutter at Ince Marshes. Waterbody (GB112068060330), Arley Brook (Source to Gale Brook) (GB112068060420) - Keckwick Brook (GB112068060520), Cogshall Brook (GB112068060510), - Mersey (Bollin confluence to Howley Weir) including Padgate Brook (GB112069061012), Hardshaw (Windle) Brook (GB112069061210)			
Hydromorphological Supporting Elements	Quantity and dynamics of flow	D-5 Management of subsurface flow pathways C-2 A Drainage and Water Management Plan (DWMP)	Any dewatering requirements for trenchless crossings would be associated solely with the tunnelling/drilling drive and reception pits at either end of the crossing. As such, dewatering volumes would be of low volume and short duration such that there would be Low to Negligible magnitude of effect on adjacent watercourse baseflow. Should the small quantities of dewatered

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
		C-4 Diversion and reinstatement of existing drainage networks C-6 Temporary provision of surface water drainage for construction areas C-7 Management of dewatering excavations C-10 Timely reinstatement following completion of works C-11 Permitting of discharges C-26 Trenchless pipeline crossings	groundwater be discharged to an adjacent watercourse there would be only a negligible change on flow regime, on account of the fact that trenchless crossings are associated with large watercourses with substantial baseline flow volumes. Considering the scale and duration of these activities in the context of WFD waterbody size and the RBMP reporting timescales, there is a high degree of confidence that the localised and short duration changes in the quantity and dynamics of flow would be of Negligible to Low magnitude of effect and would not have any impact on WFD Waterbody Status. Following the implementation of the embedded environmental measures, there would be a Low magnitude of effect on quantity and dynamics of flow. However, this would be for a very short duration and would be fully reversible. There would be no need to provide additional mitigation to facilitate compliance with WFD the Project.
Hydromorphological Supporting Elements	River continuity (lateral and longitudinal)	C-9 Stand-off distances from watercourses C-25 A Watercourse Crossing Plan (WCP) C-26 Trenchless pipeline crossings	There would no impacts on longitudinal continuity as there would be no in-channel works. The construction works to facilitate trenchless crossings would not result in any permanent reduction in the lateral connectivity of river flow and the adjacent floodplain, as

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
			the topsoil and sediment that is removed in the process of entry and reception pit excavations would be reinstated on completion of the pipeline installation, therefore the magnitude of effect would be low. Considering the scale and duration of these activities in the context of WFD waterbody size and the RBMP reporting timescales, there is a high degree of confidence that the effects of these localised changes in the river continuity would not have any impact on WFD Waterbody Status. Following the implementation of the embedded environmental measures, there would be a Negligible to Low magnitude of effect on river continuity. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Hydromorphological Supporting Elements	River width and depth variation	C-9 Stand-off distances from watercourses C-25 A Watercourse Crossing Plan (WCP) C-26 Trenchless pipeline crossings	There would be no impacts on river width and depth variation as there would be no in-channel works and the implementation of embedded environmental measures to ensure that that trenchless drive and reception pits are located sufficiently clear of river banks so there is negligible effects on them. Following the implementation of the embedded environmental measures, there would be a Negligible magnitude of effect on river width and depth variation.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
			There would be no need to provide mitigation to facilitate compliance with WFD for the Project.
Hydromorphological Supporting Elements	Structure and substrate of the river bed	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-17 Measures to avoid pollution impacts from disturbance of contaminated land (Materials Management Plan, MMP)	The construction works associated with the excavation of tunnelling/drilling drive and reception pits, either side of a crossing, would result in the short-term exposure and disturbance of ground resulting in the possible generation of sediment in run-off. This will be managed by embedded environmental measures designed to prevent silty runoff from reaching watercourses such that the levels of fine-grained sediment delivered to adjacent watercourses would be minimised as far as practicable. However, there may be a Low magnitude of effect associated with short-duration and localised changes in the structure and substrate of the river bed associated with delivery and transfer of fine-grained sediment as a result of the works that is temporarily elevated relative to baseline levels. Considering the scale and duration of these activities in the context of WFD waterbody size and the RBMP reporting timescales, there is a high degree of confidence that the effects of these localised changes in structure and substrate of the river bed would not have any impact on WFD Waterbody Status.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
		C-26 Trenchless pipeline crossings	Following the implementation of the embedded environmental measures, there is a Low magnitude of effect on the structure and substrate of the river bed. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Hydromorphological Supporting Elements	Connectivity with groundwater	D-5 Management of subsurface flow pathways C-4 Diversion and reinstatement of existing drainage networks C-7 Management of dewatering excavations C-8 Silt management measures	It is possible that the trenchless tunnelling/drilling process may alter the baseline pathway between the river and the hyporheic zone. However, given sufficient depth of the trenchless crossings below river beds (following implementation of the embedded environmental measures) and the very localised scale of this effect in the context of both river and groundwater bodies, it is logical to conclude that any change would be negligible relative to baseline conditions.
		C-26 Trenchless pipeline crossings	Considering the scale and duration of any effects in the context of WFD waterbody size (both river and groundwater), there is a high degree of confidence that the effects of these localised changes on the connectivity with groundwater would be of Negligible magnitude and would not have any impact on WFD Waterbody Status. Following the implementation of the embedded environmental measures, there would be a Negligible magnitude of effect on connectivity with groundwater.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
			There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Hydromorphological Supporting Elements	Structure of the riparian zone	C-9 Stand-off distances from watercourses C-25 A Watercourse Crossing Plan (WCP) C-26 Trenchless pipeline crossings	There would be no works affecting the riparian zone as the tunnelling/drilling drive and reception pits will be located suitably far from the bank so as to not affect riparian structure or vegetation. Following the implementation of the embedded environmental measures, there would be a Negligible magnitude of effect on the structure of the riparian zone. There would be no need to provide additional mitigation to facilitate compliance with WFD for all the Project.
Physico-chemical quality elements	Ammonia (Phys-Chem) Phosphate Dissolved oxygen Temperature	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP)	Impacts on the existing baseline water quality could occur via the disturbance of contaminated sediments. This could occur at trenchless crossing tunnelling/drilling drive and reception pits or where the pipeline is trenched through the floodplain and / or close to watercourses. Following the embedded environmental measures put in place to manage silty runoff reaching watercourses and the scale and duration of any effects in the context of WFD waterbody size, there is a high degree of confidence that the effects of these localised and short duration changes on water quality would be of low magnitude and would not have any impact on WFD Waterbody Status.
Chemical quality elements	Specific Pollutants, Priority substances and Priority Hazardous substances	C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures	

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
		C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-17 Measures to avoid pollution impacts from disturbance of contaminated land (Materials Management Plan, MMP) C-13 A Pollution Prevention Plan (PPP) C-14 Storage or hydrocarbons and other chemicals C-15 Refuelling, inspection and maintenance C-18 Treatment and discharge of contaminated groundwater C-19 A monitoring and inspection programme C-26 Trenchless pipeline crossings	Direct impacts, specifically on WFD Chemical Status, could occur as a result of accidental spillage or leakage of PAHs associated with vehicle / machinery fuels and oils, or metals (from machinery itself) at or adjacent to the location tunnelling/drilling drive and reception pits. Whilst the embedded environmental measures relating to pollution prevention and remediation are expected to manage the occurrence of such effects as far as practicable, small residual impacts (e.g. slow/gradual leaks directly into or adjacent to the watercourse) of low magnitude of effect cannot be discounted. In addition, should HDD be used there is the potential for leakage of bentonite, which could reach surface waters through cracks or fissures in strata. This would be mitigated through the use of best practice drilling methods and the implementation of the Pollution Prevention Plan. These include the use of competent contractors, frequent visual inspections and having a pump on standby to remove bentonite back to the extraction pit. Borehole Downhole Annular Pressure Monitoring would also enable contractors to ensure they are not over-pressuring surrounding ground to further reduce breakout risk as far as reasonably practicable. However, considering the scale and duration of any effects in the context of WFD waterbody size, there is a high degree of confidence that the effects of localised and short duration changes in water quality would be of low magnitude and would not have any impact on WFD Waterbody Status.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
			Following the implementation of the embedded environmental measures, there would be a Low magnitude of effect associated with trenchless crossings. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Biological quality elements	Fish, Macrophytes and phytobenthos, and invertebrates	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-13 A Pollution Prevention Plan (PPP)	Effects on biological quality elements would be associated with changes to the hydromorphology and/or water quality of a watercourse that collectively make up the habitat upon which fish, macrophytes, phytobenthos and invertebrates are dependent. As the trenchless crossings would not directly alter riverine habitat, the main potential impact would be specifically related to the mobilisation of sediments from pipeline crossings and short-term soil stockpiling adjacent to the watercourses. This could result in a short-term pulse of sediments downstream, which could in turn harm the habitats of fish, macrophytes and phytobenthos, and invertebrates. However, the embedded silt management measures would ensure that the risk of occurrence is reduced. Following the successful implementation of embedded environmental measures and the scale/duration of any effects in the context of WFD waterbody size, there is a high degree of confidence that the effects of these localised and short duration changes on biological

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
		C-26 Trenchless pipeline crossings	quality elements would be of Low magnitude and would not have any impact on WFD Waterbody Status. Following the implementation of the embedded environmental measures, there would be a Low magnitude of effect associated with biological quality elements, and soil stockpiling. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Canal water bodies - Weaver Navigation (canal section Frodsham to Weston Point Docks) (GB71210545), Bridgewater Canal (GB71210001) Manchester Ship Canal (GB71210004) Sankey Canal (GB71210055) Trent and Mersey Canal, summit to Preston Brook Tunnel(GB71210247)			
Physico-chemical quality elements	Ammonia (Phys-Chem) Phosphate Dissolved oxygen Temperature	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP)	Direct impacts, specifically on WFD Chemical Status, could occur as a result of accidental spillage or leakage of PAHs associated with vehicle / machinery fuels and oils, or metals (from machinery itself). Whilst the embedded environmental measures relating to pollution prevention and remediation are expected to manage the occurrence of such effects as far as practicable, small residual impacts (e.g. slow/gradual leaks directly into or adjacent to the watercourse), of low magnitude cannot be discounted. However, considering the scale and duration of any effects in the context of WFD waterbody
Chemical quality elements	Specific Pollutants, Priority substances and Priority	C-6 Temporary provision of surface water drainage for construction areas	

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
	Hazardous substances	C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-17 Measures to avoid pollution impacts from disturbance of contaminated land (Materials Management Plan, MMP) C-13 A Pollution Prevention Plan (PPP) C-14 Storage or hydrocarbons and other chemicals C-15 Refuelling, inspection and maintenance C-18 Treatment and discharge of contaminated groundwater C-19 A monitoring and inspection programme	size, there is a high degree of confidence that the effects of localised and short duration changes in water quality would be of Low magnitude of effect and would not have any impact on WFD Waterbody Status.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
		C-26 Trenchless pipeline crossings	
Transitional water bodies - Mersey (GB531206908100)			
Water Quality	Phytoplankton	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-17 Measures to avoid pollution impacts from disturbance of contaminated land	Through using a trenchless method of watercourse crossings, the potential for impacts on water quality receptors is significantly reduced as there will be no in channel works. While there will be trenchless crossing compounds on either bank of the Mersey these have been set back from the bank tops and will have embedded environmental measures in place to manage any release of sediment of accidental spills or leakages into the watercourse. Whilst the embedded environmental measures relating to pollution prevention and remediation are expected to manage the occurrence of such effects as far as practicable, small residual effects (e.g. slow/gradual leaks directly into or adjacent to the watercourse) of low magnitude cannot be discounted. However, considering the scale and duration of any impacts in the context of WFD waterbody size, there is a high degree of confidence that the magnitude of any

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
		(Materials Management Plan, MMP) C-13 A Pollution Prevention Plan (PPP) C-14 Storage or hydrocarbons and other chemicals C-15 Refuelling, inspection and maintenance C-18 Treatment and discharge of contaminated groundwater C-19 A monitoring and inspection programme C-26 Trenchless pipeline crossings	effects would be Negligible and would not have any impact on WFD Waterbody Status.
Hydromorphology		D-1 Underground pipeline D-5 Management of subsurface flow pathways C-6 Temporary provision of surface water drainage for construction areas	Through using a trenchless crossing method for laying the pipeline beneath the Mersey, the potential for any impacts on hydromorphology receptors has been mitigated. There will be no in-channel works for the Mersey, no new barriers to flow as a result of this method. There would be no effects on hydromorphology and the implementation of embedded environmental measures

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
		C-7 Management of dewatering excavations C-10 Timely reinstatement following completion of works C-11 Permitting of discharges C-26 Trenchless pipeline crossings	to ensure that that trenchless drive and reception pits are located sufficiently clear of river banks so there is no impact on them. The magnitude of effect on hydromorphology would therefore be Negligible and would not have any impact of WFD waterbody status.
Biological receptors	Higher sensitivity habitats Fish movement, migration or spawning Phytoplankton WFD Protected areas	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design	As the trenchless crossings would not directly alter riverine habitat, the main potential effect would be specifically related to the mobilisation of sediments from the temporary construction compounds. This could result in a short-term pulse of sediments downstream, which could in turn harm the habitats of fish, macrophytes and phytobenthos, and invertebrates. However, the embedded silt management measures would ensure that the risk of occurrence is reduced. The trenchless crossing compounds have been located so that they are outside of the higher sensitivity saltmarsh habitat areas, mitigating any impact. Following the successful implementation of embedded environmental measures and the scale/duration of any effects in the context of WFD waterbody size, there is a high degree of confidence that the effects of these

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
		C-13 A Pollution Prevention Plan (PPP) C-26 Trenchless pipeline crossings	localised and short duration changes on biological quality elements would be of Low magnitude of effect and would not have any effect on WFD Waterbody Status.
Groundwater bodies – Wirral and West Cheshire Permo-Triassic Sandstone Aquifers (GB41101G202600) Weaver and Dane Quaternary Sand and Gravel Aquifers (GB41202G991700) Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers (GB41201G101700)			
Groundwater Level elements	Quantitative dependent surface waterbody Status	D-1 Management of subsurface flow pathways C-2 A Drainage and Water Management Plan (DWMP) C-5 Private abstraction risk assessment and mitigation strategy C-7 Management of dewatering of excavations C-11 Permitting of discharges C-26 Trenchless pipeline crossings	During excavation the tunnelling/drilling drive and reception pits may require dewatering to remove shallow inflows of groundwater. The trench itself would be shallow and therefore the volumes of water to be dewatered would be negligible compared to the size of the WFD groundwater bodies and the impacts will be localised and temporary. On this basis, considering the scale and duration of works in the context of WFD waterbody size and the RBMP reporting timescales, there is a high degree of confidence that any localised and short duration changes in local groundwater levels would have a Negligible magnitude of effect and would not have any impact on WFD Waterbody Status.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
Groundwater chemical elements	General chemical test	C-1 Construction Environmental Management Plan C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-7 Management of dewatering of excavations C-11 Permitting of discharges C-13 A Pollution Prevention Plan (PPP) C-14 Storage or hydrocarbons and other chemicals C-15 Refuelling, inspection and maintenance C-16 Handling and processing of concrete C-17 Measures to avoid pollution impacts from disturbance of	Earth movements during excavation of the drive and reception pits crossings have the potential to re-mobilise contaminants and, if a suitable pathway exists, contaminate groundwater. Potential effects would be mitigated by embedded good practice construction methods (such as the Materials Management Plan, Unexpected Contamination Protocol and a Pollution Prevention Plan) to prevent deterioration in Status due to contamination of aquifers. In addition, should HDD be used there is the potential for leakage of bentonite which could reach groundwater through cracks or fissures in strata. This would be mitigated through use of best practice drilling methods and the implementation of the Pollution Prevention Plan. These include the use of competent contractors, frequent visual inspections and having a pump on standby to remove bentonite back to the extraction pit. Borehole Downhole Annular Pressure Monitoring would also enable contractors to ensure they are not over-pressuring surrounding ground to further reduce breakout risk as far as reasonably practicable. Following implementation of embedded environmental measures, this effect is considered to be insignificant and unlikely to magnitude of effect is expected to be Negligible and would not cause a deterioration in Chemical Status of groundwater bodies.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
		contaminated land (Materials Management Plan, MMP) C-18 Treatment and discharge of contaminated groundwater C-19 A monitoring and inspection programme C-26 Trenchless pipeline crossings	
Non reportable waterbodies			
Hydromorphological Supporting Elements	Quantity and dynamics of flow	D-5 Management of subsurface flow pathways C-2 A Drainage and Water Management Plan (DWMP) C-4 Diversion and reinstatement of existing drainage networks C-6 Temporary provision of surface water drainage for construction areas	Any dewatering requirements for trenchless crossings would be associated solely with the tunnelling/drilling drive and reception pits at either end of the crossing. As such, dewatering volumes would be of low volume and short duration such that there would be Low to Negligible magnitude of effects on adjacent watercourse baseflow. Should the small quantities of dewatered groundwater be discharged to an adjacent watercourse there would be only a negligible change on flow regime, as trenchless crossings are associated with large watercourses with substantial baseline flow volumes. Considering the scale and duration of these activities in the context of WFD waterbody size and the RBMP

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
		C-7 Management of dewatering excavations C-10 Timely reinstatement following completion of works C-11 Permitting of discharges C-26 Trenchless pipeline crossings	reporting timescales, there is a high degree of confidence that the localised and short duration changes in the quantity and dynamics of flow would not have any impact on WFD Waterbody Status. Following the implementation of the embedded environmental measures, there would be a Low magnitude of effect on quantity and dynamics of flow. However, this would be for a very short duration and would be fully reversible. There would be no need to provide additional mitigation to facilitate compliance with WFD the Project.
Hydromorphological Supporting Elements	River continuity (lateral and longitudinal)	C-9 Stand-off distances from watercourses C-25 A Watercourse Crossing Plan (WCP) C-26 Trenchless pipeline crossings	There would no effects on longitudinal continuity as there would be no in-channel works. The magnitude of effects is therefore Negligible. The construction works to facilitate trenchless crossings would not result in any permanent reduction in the lateral connectivity of river flow and the adjacent floodplain, as the topsoil and sediment that is removed in the process of entry and reception pit excavations would be reinstated on completion of the pipeline installation, therefore the magnitude of effect would be Low. Considering the scale and duration of these activities in the context of WFD waterbody size and the RBMP reporting timescales, there is a high degree of

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
			confidence that the effects of these localised changes in the river continuity would not have any impact on WFD Waterbody Status. Following the implementation of the embedded environmental measures, there would be a Negligible to Low magnitude of effect on river continuity. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Hydromorphological Supporting Elements	River width and depth variation	C-9 Stand-off distances from watercourses C-25 A Watercourse Crossing Plan (WCP) C-26 Trenchless pipeline crossings	There would be no effects on river width and depth variation as there would be no in-channel works and the implementation of embedded environmental measures to ensure that that trenchless drive and reception pits are located sufficiently clear of river banks so there is no impact on them. Following the implementation of the embedded environmental measures, there would be a Negligible magnitude of effect on river width and depth variation. There would be no need to provide mitigation to facilitate compliance with WFD for the Project.
Hydromorphological Supporting Elements	Structure and substrate of the river bed	C-1 A Construction Environmental Management Plan (CEMP)	The construction works associated with the excavation of tunnelling/drilling drive and reception pits, either side of a crossing, would result in the short-term exposure and disturbance of ground resulting in the possible generation of sediment in run-off. This will be managed

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
		C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-17 Measures to avoid pollution impacts from disturbance of contaminated land (Materials Management Plan, MMP) C-26 Trenchless pipeline crossings	by embedded environmental measures designed to prevent silty runoff from reaching watercourses such that the levels of fine-grained sediment delivered to adjacent watercourses would be minimised as far as practicable. However, there may be a low magnitude, short-duration and localised change in the structure and substrate of the river bed associated with delivery and transfer of fine-grained sediment as a result of the works that is temporarily elevated relative to baseline levels. Considering the scale and duration of these activities in the context of WFD waterbody size and the RBMP reporting timescales, there is a high degree of confidence that the effects of these localised changes in structure and substrate of the river bed would be of low magnitude and would not have any impact on WFD Waterbody Status. Following the implementation of the embedded environmental measures, there would be a Low magnitude of effect on the structure and substrate of the river bed. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Hydromorphological Supporting Elements	Connectivity with groundwater	D-5 Management of subsurface flow pathways C-4 Diversion and	It is possible that the trenchless tunnelling/drilling process may alter the baseline pathway between the river and the hyporheic zone. However, given sufficient depth of the trenchless crossings below river beds

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
		reinstatement of existing drainage networks C-7 Management of dewatering excavations C-8 Silt management measures C-26 Trenchless pipeline crossings	(following implementation of the embedded environmental measures) and the very localised scale of this effect in the context of both river and groundwater bodies, it is logical to conclude that any change would be negligible relative to baseline conditions. Considering the scale and duration of any effects in the context of WFD waterbody size (both river and groundwater), there is a high degree of confidence that the effects of these localised changes on the connectivity with groundwater would be Negligible and would not have any impact on WFD Waterbody Status. Following the implementation of the embedded environmental measures, there would be a Negligible magnitude of effect on connectivity with groundwater. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Hydromorphological Supporting Elements	Structure of the riparian zone	C-9 Stand-off distances from watercourses C-25 A Watercourse Crossing Plan (WCP) C-26 Trenchless pipeline crossings	There would be no works affecting the riparian zone as the tunnelling/drilling drive and reception pits will be located suitably far from the bank to not affect riparian structure or vegetation. Following the implementation of the embedded environmental measures, there would be a Negligible magnitude of effect on the structure of the riparian zone.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
			There would be no need to provide additional mitigation to facilitate compliance with WFD for all the Project.
Chemical quality elements	Ammonia (Phys-Chem) Phosphate Dissolved oxygen Temperature Specific Pollutants, Priority substances and Priority Hazardous substances	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-17 Measures to avoid pollution impacts from disturbance of contaminated land (Materials Management Plan, MMP)	Impacts on the existing baseline water quality could occur via the disturbance of contaminated sediments. This could occur at trenchless crossing tunnelling/drilling drive and reception pits or where the pipeline is trenched through the floodplain and / or close to watercourses. Considering the embedded environmental measures put in place to manage silty runoff reaching watercourses and the scale and duration of any effects in the context of WFD waterbody size, there is a high degree of confidence that the effects of these localised and short duration changes on water quality would not have any impact on WFD Waterbody Status. Direct effects, specifically on WFD Chemical Status, could occur as a result of accidental spillage or leakage of PAHs associated with vehicle / machinery fuels and oils, or metals (from machinery itself) at or adjacent to the location tunnelling/drilling drive and reception pits. Whilst the embedded environmental measures relating to pollution prevention and remediation are expected to manage the occurrence of such effects as far as practicable, small residual impacts (e.g. slow/gradual leaks directly into or adjacent to the watercourse) of low magnitude cannot be discounted. In addition, should HDD be used there is the potential for leakage of

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
		C-13 A Pollution Prevention Plan (PPP) C-14 Storage or hydrocarbons and other chemicals C-15 Refuelling, inspection and maintenance C-18 Treatment and discharge of contaminated groundwater C-19 A monitoring and inspection programme C-26 Trenchless pipeline crossings	bentonite, which could reach surface waters through cracks or fissures in strata. This would be mitigated through the use of best practice drilling methods and the implementation of the Pollution Prevention Plan. These include the use of competent contractors, frequent visual inspections and having a pump on standby to remove bentonite back to the extraction pit. Borehole Downhole Annular Pressure Monitoring would also enable contractors to ensure they are not over-pressuring surrounding ground to further reduce breakout risk as far as reasonably practicable. However, considering the scale and duration of any effects in the context of WFD waterbody size, there is a high degree of confidence that the effects of localised and short duration changes in water quality would not have any impact on WFD Waterbody Status. Following the implementation of the embedded environmental measures, there would be a Low magnitude of effect associated with trenchless crossings. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Biological quality elements	Fish, Macrophytes and phytobenthos, and invertebrates	C-1 A Construction Environmental	Effects on biological quality elements would be associated with changes to the hydromorphology and/or water quality of a watercourse that collectively make up

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
		Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-13 A Pollution Prevention Plan (PPP) C-26 Trenchless pipeline crossings	the habitat upon which fish, macrophytes, phytobenthos and invertebrates are dependent. As the trenchless crossings would not directly alter riverine habitat, the main potential effect would be specifically related to the mobilisation of sediments from pipeline crossings and short-term soil stockpiling adjacent to the watercourses. This could result in a short-term pulse of sediments downstream, which could in turn harm the habitats of fish, macrophytes and phytobenthos, and invertebrates. However, the embedded silt management measures would ensure that the risk of occurrence is reduced. Following implementation of embedded environmental measures and the scale/duration of any effects in the context of WFD waterbody size, there is a high degree of confidence that the effects of these localised and short-duration changes on biological quality elements would not have any impact on WFD Waterbody Status. Following the implementation of the embedded environmental measures, there would be a Low magnitude of effect associated with biological quality elements, and soil stockpiling. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.

* described further in **Chapter 7: Water Environment**

Table 7E.24 Impact assessment for temporary access tracks

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures and their subjects of particular relevance*	Assessment of effects on WFD
River water bodies – - Sinderland Brook (GB112069060980), Whittle Brook (Mersey Estuary) (GB112069060990), Sutton Brook (GB112069061170), - Weaver (Dane to Frodsham) (GB112068060500), - Mersey/ Manchester Ship Canal (Irwell/Manchester Ship Canal to Bollin) (GB112069061011), - River Weaver (Barnet to Valley Brook) (GB112068060461), River Weaver (Valley Brook to Winsford Flashes) (GB112068060462), - River Weaver (Winsford Flashes to Dane) (GB112068060463), Bollin (Ashley Mill to Manchester Ship Canal) (GB112069061382), - Dane (Wheelock to Weaver) (GB112068060470), Gale Brook (GB112068060430) Puddinglake Brook (GB112068060220) - Bogart Brook (GB112068060540) Cuddington Brook (Source to Crowton Brook) (GB112068060480) Wade Brook (GB112068060370) - Peckmill Brook, Hoolpool Gutter at Ince Marshes. Waterbody (GB112068060330) Arley Brook (Source to Gale Brook) (GB112068060420) - Keckwick Brook (GB112068060520) Cogshall Brook (GB112068060510) - Mersey (Bollin confluence to Howley Weir) including Padgate Brook (GB112069061012), Hardshaw (Windle) Brook (GB112069061210)			
Hydromorphological Supporting Elements	Quantity and dynamics of flow	D-5 Management of subsurface flow pathways C-2 A Drainage and Water Management Plan (DWMP) C-4 Diversion and reinstatement of existing drainage networks	The construction of the temporary access tracks would be accompanied by a Drainage Management Plan which would ensure that the dynamics of surface water flow reaching watercourses is not affected as the natural flow regime would be maintained through the use of SuDS. SuDS would attenuate flows to greenfield

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures and their subjects of particular relevance*	Assessment of effects on WFD
		C-6 Temporary provision of surface water drainage for construction areas C-7 Management of dewatering excavations C-10 Timely reinstatement following completion of works C-11 Permitting of discharges	rates and reflect baseline drainage catchments. Following the completion of construction, the access tracks would be removed and the land returned to the previous state. Considering the scale and duration of these activities in the context of WFD waterbody size, the RBMP reporting timescales and embedded mitigations, there is a high degree of confidence that any localised and short duration changes in the quantity and dynamics of flow will be of Negligible magnitude of effect and would not have any impact on WFD Waterbody Status.
Hydromorphological Supporting Elements	River continuity (lateral and longitudinal)	C-9 Stand-off distances from watercourses C-25 A Watercourse Crossing Plan (WCP) C-28 Temporary construction access watercourse crossings	Where temporary culverts are to be installed for minor watercourse crossings, these would have a small, localised impact on lateral and longitudinal connectivity. Culverts would only be installed on minor watercourses, with larger watercourses being crossed by bridges which would have no impact on longitudinal connectivity. Where temporary culverts are proposed, they would cover a very small area of minor watercourses relative to the whole WFD river catchment and would only be in place for a limited duration and would be fully returned to baseline conditions following the removal of the temporary access tracks.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures and their subjects of particular relevance*	Assessment of effects on WFD
			Considering the scale and duration of these activities in the context of WFD waterbody size, the RBMP reporting timescales and embedded environmental measures, there is a high degree of confidence that the effects of these localised changes in the river continuity would not have any impact on WFD Waterbody Status and a Low magnitude of effect on river continuity. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Hydromorphological Supporting Elements	River width and depth variation	C-28 Temporary construction access watercourse crossings	Where temporary culverts are to be installed for minor watercourse crossings, these would have a small, localised impact on the river width and depth variation. However, they would be of a very small scale relative to the size of the WFD river water bodies and would only be in place for a limited duration and would be fully returned to the previous state following the removal of the temporary access tracks. Considering the scale and duration of these activities in the context of WFD waterbody size the RBMP reporting timescales and embedded environmental measures, there is a high degree of confidence that the effects of these localised changes in the river width and depth variation would not have any impact on WFD Waterbody

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures and their subjects of particular relevance*	Assessment of effects on WFD
			Status and would represent a Low magnitude of effect on river width and depth variation. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Hydromorphological Supporting Elements	Structure and substrate of the river bed	D-4 Temporary access track design C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-17 Measures to avoid pollution impacts from disturbance of contaminated land (Materials Management Plan, MMP)	Where temporary culverts are to be installed for minor watercourse crossings, these would have a small, localised impact on the substrate of the river bed. However, they would be of small scale relative to the size of the WFD river water bodies and would only be in place for a limited duration. Considering the scale and duration of these activities in the context of WFD waterbody size, the RBMP reporting timescales and embedded environmental measures, there is a high degree of confidence that the effects of these localised changes in the structure and substrate of the river bed would not have any impact on WFD Waterbody Status and a Low magnitude of effect on the structure and substrate of the river bed. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures and their subjects of particular relevance*	Assessment of effects on WFD
Hydromorphological Supporting Elements	Connectivity with groundwater	D-5 Management of subsurface flow pathways C-4 Diversion and reinstatement of existing drainage networks C-8 Silt management measures C-28 Temporary construction access watercourse crossings	Where temporary culverts are to be installed for minor watercourse crossings, these would have a small, localised impact on groundwater connectivity. However, they would be of small scale relative to the size of the WFD groundwater bodies and would only be in place for a limited duration and would be fully returned to the previous state following the removal of the temporary access tracks. Considering the scale and duration of any effects in the context of WFD waterbody size (both river and groundwater), there is a high degree of confidence that the effects of these localised changes on the connectivity with groundwater would be of Negligible magnitude and not have any impact on WFD Waterbody Status. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Hydromorphological Supporting Elements	Structure of the riparian zone	C-28 Temporary construction access watercourse crossings	Where the temporary access tracks cross watercourses there may be impacts to the riparian zone. However, these would be of a limited width, and temporary duration and would be returned to their previous state upon completion of the works. Following the implementation of the embedded environmental measures, there would be a

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures and their subjects of particular relevance*	Assessment of effects on WFD
			temporary, Low magnitude of effect in the structure of the riparian zone. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Physico-chemical quality elements	Ammonia (Phys-Chem) Phosphate Dissolved oxygen Temperature	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-17 Measures to avoid pollution impacts from disturbance of contaminated land (Materials Management Plan, MMP) C-13 A Pollution Prevention Plan (PPP) C-14 Storage of hydrocarbons and other chemicals C-15 Refuelling, inspection and maintenance C-18 Treatment and discharge of contaminated groundwater	Low magnitude impacts to the existing baseline water quality could occur via the disturbance of contaminated sediments. This could occur during construction of the access tracks. However, embedded mitigations to manage silty runoff during construction would minimise this risk as far as possible.
Chemical quality elements	Specific Pollutants, Priority substances and Priority Hazardous substances		Impacts on WFD Chemical Status, could occur as a result of accidental spillage or leakage of PAHS associated with vehicle/machinery fuels and oils, or metals (from machinery itself) used during construction. Following the implementation of the embedded environmental measures, there would be a Low magnitude of effect associated with temporary access track construction. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures and their subjects of particular relevance*	Assessment of effects on WFD
		C-19 A monitoring and inspection programme	
Biological quality elements	Fish, Macrophytes and phytobenthos, and invertebrates	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-13 A Pollution Prevention Plan (PPP)	Effects on biological quality elements are associated with changes to the hydromorphology and/or water quality of a watercourse that collectively make up the habitat upon which fish, macrophytes / phytobenthos and invertebrates are dependent. The main potential impact would be specifically related to the mobilisation of sediments from track construction. However, embedded environmental measures to manage silty runoff will ensure that this risk is minimised as far as is practicable. There is also the potential for pollutants to enter the waterbody from vehicles and machinery also having the potential to negatively impact biological quality elements. However, the pollution prevention measures are deemed sufficient to mitigate this risk and prevent any deterioration of water quality and therefore biological quality. Following implementation of embedded environmental measures and the scale and duration of any effects in the context of WFD waterbody size, there is a high degree of confidence that the effects of these localised and short-duration changes on biological quality

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures and their subjects of particular relevance*	Assessment of effects on WFD
Non-reportable waterbodies			elements would be of Low magnitude and would not have any impact on WFD Waterbody Status. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Hydromorphological Supporting Elements	Quantity and dynamics of flow	D-5 Management of subsurface flow pathways C-2 A Drainage and Water Management Plan (DWMP) C-4 Diversion and reinstatement of existing drainage networks C-6 Temporary provision of surface water drainage for construction areas C-7 Management of dewatering excavations C-10 Timely reinstatement following completion of works C-11 Permitting of discharges	The construction of the temporary access tracks would be accompanied by a Drainage Management Plan, which would ensure that the dynamics of surface water flow reaching watercourses is not affected as the natural flow regime would be maintained through the use of SuDS. SuDS would attenuate flows to greenfield rates and reflect baseline drainage catchments. Following the completion of construction, the access tracks would be removed and the land returned to the previous state. Considering the scale and duration of these activities in the context of non-reportable WFD waterbody size, the RBMP reporting timescales and embedded environmental measures, there is a high degree of confidence that any localised and short duration changes in the quantity and dynamics of flow will be of Negligible Magnitude and would not have any effect on WFD Waterbody

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures and their subjects of particular relevance*	Assessment of effects on WFD
			Status. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Hydromorphological Supporting Elements	River continuity (lateral and longitudinal)	C-9 Stand-off distances from watercourses C-25 A Watercourse Crossing Plan (WCP) C-28 Temporary construction access watercourse crossings	Where temporary culverts are to be installed for minor watercourse crossings, these would have a small, localised impact on lateral and longitudinal connectivity. Culverts would only be installed on minor watercourses, with larger watercourses being crossed by bridges which would have no impact on longitudinal connectivity. Where temporary culverts are proposed, they would cover a very small area of minor watercourse relative to the whole WFD non-reportable catchment, would only be in place for a limited duration and would be fully returned to baseline conditions following the removal of the temporary access tracks. Considering the scale and duration of these activities in the context of non-reportable WFD waterbody size, the RBMP reporting timescales and embedded environmental measures, there is a high degree of confidence that the effects of these localised changes in the river continuity would be of Low magnitude and would not have any impact on WFD Waterbody Status. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures and their subjects of particular relevance*	Assessment of effects on WFD
Hydromorphological Supporting Elements	River width and depth variation	C-28 Temporary construction access watercourse crossings	Where temporary culverts are to be installed for minor watercourse crossings, these would have a small, localised impact on the river width and depth variation. However, they would be of a very small scale relative to the size of the WFD river water bodies and would only be in place for a limited duration and would be fully returned to the previous state following removal of the temporary access tracks. Considering the scale and duration of these activities in the context of non-reportable WFD waterbody size and the RBMP reporting timescales, there is a high degree of confidence that the effects of these localised changes in the river width and depth variation would be of Low magnitude of effect and would not have any impact on WFD Waterbody Status. Following the implementation of the embedded environmental measures, there would be a Low magnitude of effect on river width and depth variation. There would be no need to provide mitigation to facilitate compliance with WFD for all the Project.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures and their subjects of particular relevance*	Assessment of effects on WFD
Hydromorphological Supporting Elements	Structure and substrate of the river bed	D-4 Temporary access track design C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-17 Measures to avoid pollution impacts from disturbance of contaminated land (Materials Management Plan, MMP)	Where temporary culverts are to be installed for minor watercourse crossings, these would have a small, localised impact on the substrate of the river bed. However, they would be of a very small scale relative to the size of the non-reportable WFD river water bodies and would only be in place for a limited duration. Considering the scale and duration of these activities in the context of non-reportable WFD waterbody size and the RBMP reporting timescales, there is a high degree of confidence that the effects of these localised changes in the structure and substrate of the river bed would be of low magnitude and would have any impact on WFD Waterbody Status. Following the implementation of embedded environmental measures, there would be a temporary, Low magnitude of effect on the structure and substrate of the river bed. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Hydromorphological Supporting Elements	Connectivity with groundwater	D-5 Management of subsurface flow pathways C-4 Diversion and reinstatement of existing drainage networks	Where temporary culverts are to be installed for minor watercourse crossings, these would have a small, localised impact on groundwater connectivity. However, they would be of a very

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures and their subjects of particular relevance*	Assessment of effects on WFD
		C-8 Silt management measures C-28 Temporary construction access watercourse crossings	small scale relative to the size of the WFD groundwater bodies and would only be in place for a limited duration and would be fully returned to the previous state following the removal of the temporary access tracks. Considering the scale and duration of any effects in the context of WFD waterbody size (both non-reportable and groundwater), there is a high degree of confidence that the localised changes on the connectivity with groundwater would be of Negligible magnitude of effect and would not have any impact on WFD Waterbody Status. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Hydromorphological Supporting Elements	Structure of the riparian zone	C-28 Temporary construction access watercourse crossings	Where the temporary access tracks cross watercourses there may be impacts to the riparian zone. However, these would be of a limited width, and temporary duration and would be returned to their previous state upon completion of the works. Following the implementation of the embedded environmental measures, there would be a temporary, Low magnitude of effect on the structure of the riparian zone. There would be no

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures and their subjects of particular relevance*	Assessment of effects on WFD
			need to provide additional mitigation to facilitate compliance with WFD for all phases of the Project.
Physico-chemical quality elements	Ammonia (Phys-Chem) Phosphate Dissolved oxygen Temperature	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-17 Measures to avoid pollution impacts from disturbance of contaminated land (Materials Management Plan, MMP)	Effects on the existing baseline water quality could occur via the disturbance of contaminated sediments. This could occur during construction of the access tracks. However, embedded environmental measures to manage silty runoff during construction would minimise this risk as far as possible.
Chemical quality elements	Specific Pollutants, Priority substances and Priority Hazardous substances	C-13 A Pollution Prevention Plan (PPP) C-14 Storage of hydrocarbons and other chemicals C-15 Refuelling, inspection and maintenance C-18 Treatment and discharge of contaminated groundwater	Impacts on WFD Chemical Status, could occur as a result of accidental spillage or leakage of PAHS associated with vehicle / machinery fuels and oils, or metals (from machinery itself) used during construction. Whilst the embedded environmental measures relating to pollution prevention and remediation are expected to manage the occurrence of such effects as far as practicable, small, residual effects (e.g. slow/gradual leaks directly into or adjacent to the watercourse) cannot be discounted. However, considering the scale and duration of any effects in the context of non-reportable WFD waterbody size, there is a high degree of confidence that any localised and short-duration changes in water quality would be of Low magnitude of effect and would not have any effect on WFD Waterbody Status. There would be no

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures and their subjects of particular relevance*	Assessment of effects on WFD
		C-19 A monitoring and inspection programme	need to provide additional mitigation to facilitate compliance with WFD for the Project.
Biological quality elements	Fish, Macrophytes and phytobenthos, and invertebrates	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-13 A Pollution Prevention Plan (PPP)	Effects on biological quality elements are associated with changes to the hydromorphology and/or water quality of a watercourse that collectively make up the habitat upon which fish, macrophytes / phytobenthos and invertebrates depend. The main potential impact would be specifically related to the mobilisation of sediments from track construction and the potential for pollution from fuels/oils and lubricants from vehicles using the tracks. However, embedded measures to manage silty runoff and pollution prevention controls will ensure that this risk is minimised as far as is practicable. Following implementation of embedded environmental measures and the scale/duration of any effects in the context of non-reportable WFD waterbody size, there is a high degree of confidence that the effects of these localised and short-duration changes on biological quality elements would be of Low magnitude and would not have any effect on WFD Waterbody Status. There would be no need to provide additional

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures and their subjects of particular relevance*	Assessment of effects on WFD
			mitigation to facilitate compliance with WFD for the Project.

* described further in **Chapter 7: Water Environment**

Table 7E.23 Impact assessment for temporary construction compounds

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures	Assessment of effects on WFD
River water bodies – - Sinderland Brook (GB112069060980), Whittle Brook (Mersey Estuary) (GB112069060990), Sutton Brook (GB112069061170) - Weaver (Dane to Frodsham) (GB112068060500) - Mersey/ Manchester Ship Canal (Irwell/Manchester Ship Canal to Bollin) (GB 112069061011), - River Weaver (Barnet to Valley Brook) (GB112068060461), River Weaver (Valley Brook to Winsford Flashes) (GB112068060462) - River Weaver (Winsford Flashes to Dane) (GB112068060463), Bollin (Ashley Mill to Manchester Ship Canal) (GB112069061382) - Dane (Wheelock to Weaver) (GBGB112068060470), Gale Brook (GB112068060430), Puddinglake Brook (GB112068060220), - Bogart Brook (GB112068060540), Cuddington Brook (Source to Crowton Brook) (GB112068060480), Wade Brook (GB112068060370) - Peckmill Brook, Hoolpool Gutter at Ince Marshes. Waterbody (GB112068060330), Arley Brook (Source to Gale Brook) (GB112068060420) - Keckwick Brook (GB112068060520), Cogshall Brook (GB112068060510), - Mersey (Bollin confluence to Howley Weir) including Padgate Brook (GB112069061012), Hardshaw (Windle) Brook (GB112069061210)			
Hydromorphological Supporting Elements	Quantity and dynamics of flow	D-5 Management of subsurface flow pathways C-2 A Drainage and Water Management Plan (DWMP) C-4 Diversion and reinstatement of existing drainage networks	The delivery of a Drainage Management Plan during the construction phase would ensure that the construction of the temporary compounds does not have any adverse effect on flow paths. Therefore, there would be no impact on the water entering watercourses and no impact on the quantity and dynamics of flow.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures	Assessment of effects on WFD
		C-6 Temporary provision of surface water drainage for construction areas C-7 Management of dewatering excavations C-10 Timely reinstatement following completion of works C-11 Permitting of discharges	Considering the scale and duration of these activities in the context of WFD waterbody size the RBMP reporting timescales and inclusion of embedded environmental measures, there is a high degree of confidence that the localised and short duration changes in the quantity and dynamics of flow would have a Negligible magnitude of effect and not have any impact on WFD Waterbody Status. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Hydromorphological Supporting Elements	River continuity (lateral and longitudinal)	None required	There would be no effects on river continuity as there would be no in-channel works associated with this activity.
Hydromorphological Supporting Elements	River width and depth variation	None required	There would be no effects on river width and depth variation as there would be no in-channel works associated with this activity.
Hydromorphological Supporting Elements	Structure and substrate of the river bed	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas	The construction works associated with the temporary construction compounds may result in short-term exposure and disturbance of ground resulting in the generation of sediment in run-off. This is expected to be managed by embedded environmental measures such that the levels of fine-

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures	Assessment of effects on WFD
		C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-17 Measures to avoid pollution impacts from disturbance of contaminated land (Materials Management Plan, MMP)	grained sediment delivered to adjacent watercourses would be minimised as far as practicable. However, there may be a short-duration and localised change in the structure and substrate of the river bed associated with the delivery and transfer of fine-grained sediment as a result of the works that is temporarily elevated relative to baseline levels. Considering the scale and duration of these activities in the context of WFD waterbody size the RBMP reporting timescales and the implementation of embedded environmental measures, there is a high degree of confidence that the localised and short duration changes in the structure and substrate of the river bed would be of Low magnitude of effect and would not have any impact on WFD Waterbody Status.
Hydromorphological Supporting Elements	Connectivity with groundwater	None required	The proposed works would have no effect on connectivity with groundwater.
Hydromorphological Supporting Elements	Structure of the riparian zone	C-9 Stand-off distances from watercourses	There would be no works affecting the riparian zone as the temporary construction compounds will be located suitably far from the bank to not affect the riparian zone.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures	Assessment of effects on WFD
Physico-chemical quality elements	Ammonia (Phys-Chem)	C-1 A Construction Environmental Management Plan (CEMP)	Impacts on the existing baseline water quality could occur via the disturbance of contaminated sediments during construction. Considering the embedded environmental measures and the scale and duration of any effects in the context of WFD waterbody size, there is a high degree of confidence that the effects of these localised and short duration changes on water quality would be of Low magnitude and would not have any impact on WFD Waterbody Status.
Chemical quality elements	Phosphate	C-2 A Drainage and Water Management Plan (DWMP)	
	Dissolved oxygen	C-6 Temporary provision of surface water drainage for construction areas	Direct impacts, specifically on WFD Chemical Status, could occur as a result of accidental spillage or leakage of PAHs associated with vehicle / machinery fuels and oils, or metals (from machinery itself). Whilst the embedded environmental measures relating to pollution prevention and remediation are expected to manage the occurrence of such effects as far as practicable, small residual impacts (e.g. slow/gradual leaks directly into or adjacent to the watercourse) cannot be discounted. However, considering the scale and duration of any effects in the context of WFD waterbody size, there is a high degree of confidence that the effects of localised and short duration changes in water quality would be of Low magnitude and would not have any impact on WFD Waterbody Status. There would be no need to provide additional
	Temperature	C-8 Silt management measures	
		C-10 Timely reinstatement following completion of works	
		C-12 Discharge outfall design	
	Specific Pollutants, Priority substance s and Priority Hazardous substance s	C-17 Measures to avoid pollution impacts from disturbance of contaminated land (Materials Management Plan, MMP)	
		C-13 A Pollution Prevention Plan (PPP)	
		C-14 Storage of hydrocarbons and other chemicals	
		C-15 Refuelling, inspection and maintenance	
		C-18 Treatment and discharge of contaminated groundwater	
		C-19 A monitoring and inspection programme	

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures	Assessment of effects on WFD
Biological quality elements	Fish, Macrophytes and phytobenthos, and invertebrates	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-13 A Pollution Prevention Plan (PPP)	mitigation to facilitate compliance with WFD for the Project. Effects on biological quality elements are associated with changes to the hydromorphology and/or water quality of a watercourse that collectively make up the habitat upon which fish, macrophytes / phytobenthos and invertebrates are dependent. The main potential effect would be specifically related to the mobilisation of sediments from short-term soil stockpiling adjacent to the watercourses. This could result in a short-term pulse of sediments downstream, which could in turn harm the habitats of fish, macrophytes and phytobenthos, and invertebrates. The embedded silt management mitigation measures would ensure that this risk is managed as far as is practicable. In addition, the potential for pollutants to enter the waterbody from construction machinery also has the potential to negatively impact biological quality elements. However, the pollution prevention measures are deemed sufficient to mitigate this risk and prevent any deterioration of water quality and therefore biological quality. Following implementation of embedded environmental measures and the scale/duration of any effects in the context of WFD waterbody size, there is a high degree of confidence that the effects

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures	Assessment of effects on WFD
			of these localised and short duration changes on biological quality elements would be of Low magnitude and would not have any impact on WFD Waterbody Status. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Canal water bodies – • Weaver Navigation (canal section Frodsham to Weston Point Docks) (GB71210545), • Bridgewater Canal (GB71210001) • Manchester Ship Canal (GB71210004) • Sankey Canal (GB71210055) • Trent and Mersey Canal, summit to Preston Brook Tunnel (GB71210247)			
Physico-chemical quality elements	Ammonia (Phys-Chem)	C-1 A Construction Environmental Management Plan (CEMP)	Direct effects, on WFD Chemical Status, could occur as a result of accidental spillage or leakage of PAHs associated with vehicle / machinery fuels and oils, or metals (from machinery itself). The embedded environmental measures relating to pollution prevention and remediation are expected to manage the occurrence of such effects as far as practicable. Considering the scale and duration of any impacts in the context of WFD waterbody size, there is a high degree of confidence that the effects of localised and short duration changes in water quality would be of Low magnitude and would not have any impact on WFD Waterbody Status. There would be no need to
	Phosphate	C-2 A Drainage and Water Management Plan (DWMP)	
	Dissolved oxygen	C-6 Temporary provision of surface water drainage for construction areas	
	Temperature	C-8 Silt management measures	
		C-10 Timely reinstatement following completion of works	
Chemical quality elements		C-12 Discharge outfall design	
	Specific Pollutants, Priority substance	C-17 Measures to avoid pollution impacts from disturbance of contaminated land (Materials Management Plan, MMP)	

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures	Assessment of effects on WFD
Transitional water bodies - Mersey (GB531206908100)	s and Priority Hazardous substances	C-13 A Pollution Prevention Plan (PPP) C-14 Storage of hydrocarbons and other chemicals C-15 Refuelling, inspection and maintenance C-18 Treatment and discharge of contaminated groundwater C-19 A monitoring and inspection programme	provide additional mitigation to facilitate compliance with WFD for the Project.
	Water Quality	Phytoplankton C-1 A Code of Construction Practice (CEMP) C-2 DWMP C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-17 Measures to avoid pollution impacts from disturbance of contaminated land (Materials Management Plan, MMP)	Trenchless crossing compounds will be present on either bank of the Mersey. These have been set back from the bank tops and will have embedded environmental measures in place to manage any release of sediment of accidental spills or leakages into the watercourse. The embedded environmental measures relating to pollution prevention and remediation are expected to manage the occurrence of such effects as far as practicable and considering the scale and duration of any effects in the context of WFD waterbody size, there is a high degree of confidence that the magnitude of any effects would be Negligible and

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures	Assessment of effects on WFD
		C-13 A Pollution Prevention Plan (PPP) C-14 Storage or hydrocarbons and other chemicals C-15 Refuelling, inspection and maintenance C-18 Treatment and discharge of contaminated groundwater C-19 A monitoring and inspection programme C-26 Trenchless pipeline crossings	would not have any impact on WFD Waterbody Status. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Hydromorphology receptors		Generic embedded measures D-5 Management of subsurface flow pathways C-2 A Drainage and Water Management Plan (DWMP) C-4 Diversion and reinstatement of existing drainage networks C-6 Temporary provision of surface water drainage for construction areas C-7 Management of dewatering excavations C-10 Timely reinstatement following completion of works C-11 Permitting of discharges	The temporary construction compounds on both banks of the Mersey are not expected to impact on hydromorphology receptors as they will not involve any in-channel works. The temporary construction compounds will have SuDS which will manage and treat surface water runoff before discharge to the Mersey. Given the size of the Mersey WFD waterbody relative to the discharges related to temporary compounds the magnitude of effect is Negligible . There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures	Assessment of effects on WFD
Biological receptors	Higher sensitivity habitats Fish movement, migration or spawning Phytoplankton WFD Protected areas	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-13 A Pollution Prevention Plan (PPP) C-26 Trenchless pipeline crossings	As the trenchless crossings would not directly alter estuary habitat, the main potential effect would be specifically related to the mobilisation of sediments from temporary construction compounds. This could result in a short-term pulse of sediments downstream, which could in turn harm the habitats of fish, macrophytes and phyto-benthos, and invertebrates. However, the embedded silt management measures would ensure that the risk of occurrence is reduced. The trenchless crossing compounds have been located so that they are outside of the higher sensitivity saltmarsh habitat areas. Following implementation of embedded environmental measures and the scale/duration of any effects in the context of WFD waterbody size, there is a high degree of confidence that the effects of these localised and short duration changes on biological quality elements would be of Low magnitude and would not have any impact on WFD Waterbody Status. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.

* described further in **Chapter 7: Water Environment**

Table 7E.24 Impact assessment for permanent above ground infrastructure

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
River water bodies – - Sinderland Brook (GB112069060980), Whittle Brook (Mersey Estuary) (GB112069060990), Weaver (Dane to Frodsham) (GB112068060500) - Mersey/ Manchester Ship Canal (Irwell/Manchester Ship Canal to Bollin) (GB112069061011), - River Weaver (Barnet to Valley Brook) (GB112068060461), River Weaver (Valley Brook to Winsford Flashes) (GB112068060462) - Puddinglake Brook (GB112068060220), Cuddington Brook (Source to Crowton Brook) (GB112068060480), - Cogshall Brook (GB112068060510), Gale Brook (GB112068060430)			
Hydromorphological Supporting Elements	Quantity and dynamics of flow	D-5 Management of subsurface flow pathways C-2 DWMP C-4 Diversion and reinstatement of existing drainage networks C-6 Temporary provision of surface water drainage for construction areas C-7 Management of dewatering excavations C-10 Timely reinstatement following completion of works C-11 Permitting of discharges	The implementation of a Drainage Management Plan during the construction phase would ensure that the construction of the temporary compounds does not have any adverse impact on flow paths. Therefore, there would be no impact on the water entering watercourses and no impact on the quantity and dynamics of flow. The HAGIs and BVIs would also have a suitable SuDS system incorporated into their design to avoid any permanent impacts of flow. Considering the scale and duration of these activities in the context of WFD waterbody size, the RBMP reporting timescales and embedded environmental measures, there is a high degree of confidence that the localised and short duration changes in the quantity and dynamics of flow would be of Negligible magnitude of effect and would not have any impact on WFD Waterbody Status.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
Hydromorphological Supporting Elements	River continuity (lateral and longitudinal)	None required	There would be no effects on river continuity as there would be no in-channel works associated with this activity.
Hydromorphological Supporting Elements	River width and depth variation	None required	There would be no effects on river width and depth variation as there would be no in-channel works associated with this activity.
Hydromorphological Supporting Elements	Structure and substrate of the river bed	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-17 Measures to avoid pollution impacts from disturbance of contaminated land	There are no in channel works associated with this activity that may affect the river bed. Sediment inputs as a result of construction may impact the bed of the waterbodies. However, the implementation of the embedded environmental measures to manage silt will ensure that there is a Negligible magnitude of effect on the structure and substrate of the river bed. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
		(Materials Management Plan, MMP)	
Hydromorphological Supporting Elements	Connectivity with groundwater	None required	The proposed works would have no effect on connectivity with groundwater.
Hydromorphological Supporting Elements	Structure of the riparian zone	C-9 Stand-off distances from watercourses	There would be no works affecting the riparian zone as the permanent above ground infrastructure will be located suitably far from the bank so as to not affect riparian vegetation.
Physico-chemical quality elements	Ammonia (Phys-Chem) Phosphate Dissolved oxygen Temperature	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas	Impacts on the existing baseline water quality could occur via the disturbance of contaminated sediments during construction. Considering the embedded environmental measures and the scale/duration of any effects in the context of WFD waterbody size, there is a high degree of confidence that the effects of these localised and short duration changes on water quality would be of Low magnitude and would not have any impact on WFD Waterbody Status. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Chemical quality elements	Specific Pollutants, Priority substances and Priority Hazardous substances	C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-17 Measures to avoid pollution impacts from	

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
		disturbance of contaminated land (Materials Management Plan, MMP) C-13 A Pollution Prevention Plan (PPP) C-14 Storage or hydrocarbons and other chemicals C-15 Refuelling, inspection and maintenance C-18 Treatment and discharge of contaminated groundwater C-19 A monitoring and inspection programme	
Biological quality elements	Fish, Macrophytes and phytobenthos, and invertebrates	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP) C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures	Effects on biological quality elements are associated with changes to the hydromorphology and/or water quality of a watercourse that collectively make up the habitat upon which fish, macrophytes/phytobenthos and invertebrates are dependent. The main potential impact would be specifically related to the mobilisation of sediments from short-term soil stockpiling adjacent to the watercourses. This could result in a short-term pulse of sediments downstream, which could in turn harm the habitats of fish, macrophytes and phytobenthos, and invertebrates. The embedded silt management mitigation measures would

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
		C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-13 A Pollution Prevention Plan (PPP)	ensure that this risk is managed as far as is practicable. In addition, the potential for pollutants to enter the waterbody from construction machinery also has the potential to negatively impact biological quality elements. However, pollution prevention measures are deemed sufficient to mitigate this risk and prevent any deterioration of water quality and therefore biological quality. Following implementation of embedded environmental measures and the scale and duration of any effects in the context of WFD waterbody size, there is a high degree of confidence that the effects of these localised and short duration changes on biological quality elements would be of Low magnitude and would not have any impact on WFD Waterbody Status. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.
Canal water bodies – Manchester Ship Canal (GB71210004)			
Physico-chemical quality elements	Ammonia (Phys-Chem) Phosphate Dissolved oxygen Temperature	C-1 A Construction Environmental Management Plan (CEMP) C-2 A Drainage and Water Management Plan (DWMP)	Direct effects, specifically on WFD Chemical Status, could occur as a result of accidental spillage or leakage of PAHs associated with vehicle/machinery fuels and oils, or metals (from machinery itself). However, the embedded environmental measures relating to pollution prevention and remediation, along with the infrastructure being set back from the Manchester Ship Canal, would manage the

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
Chemical quality elements	Specific Pollutants, Priority substances and Priority Hazardous substances	C-6 Temporary provision of surface water drainage for construction areas C-8 Silt management measures C-10 Timely reinstatement following completion of works C-12 Discharge outfall design C-17 Measures to avoid pollution impacts from disturbance of contaminated land (Materials Management Plan, MMP) C-13 A Pollution Prevention Plan (PPP) C-14 Storage or hydrocarbons and other chemicals C-15 Refuelling, inspection and maintenance C-18 Treatment and discharge of contaminated groundwater	occurrence of such effects as far as practicable. Therefore, considering the scale and duration of any effects in the context of WFD waterbody size, there is a high degree of confidence that the effects of localised and short duration changes in water quality would be of Low magnitude and would not have any impact on WFD Waterbody Status. There would be no need to provide additional mitigation to facilitate compliance with WFD for the Project.

Water Framework Directive (WFD) element	WFD sub-element	Embedded environmental measures *	Assessment of effects on WFD
		C-19 A monitoring and inspection programme	

* described further in **Chapter 7: Water Environment**

7. Conclusions

7.1 Overview

- 7.1.1 Twenty one river, five canal, one transitional and five WFD groundwater bodies were considered to have project activities/infrastructure types within them or in close enough proximity that they will cause some degree of risk to the delivery of WFD objectives. However, upon further assessment of these activities and infrastructure types, including consideration of the effectiveness of the embedded environmental measures to manage any effects, it is concluded that the Project is compliant with the WFD.

7.2 Assessment of the Risk of Deterioration

- 7.2.1 The assessment above has concluded that the embedded environmental measures would be sufficient for preventing any reduction in the Status/Potential of all WFD classification elements for all screened-in WFD water bodies for all elements of the Project. It can therefore be concluded that it is not anticipated that the Project would result in any WFD deterioration for any WFD waterbody.

7.3 Enhancements or Positive Contributions to WFD Waterbody Objectives

- 7.3.1 The reasons for not achieving Good for all screened in WFD water bodies are included in **Appendix 7B: Detailed water environment baseline information**.
- 7.3.2 Following implementation of embedded environmental measures, none of the proposed project activities are expected to have any impact, positive or negative on the reasons for not achieving good for any of the WFD water bodies in the Study Area.
- 7.3.3 While it has been seen that none of the RBMP Programme of measures or WFD HMWB Mitigation measures will be impacted as a result of the Project. No project activities will contribute towards their implementation.
- 7.3.4 It is therefore not anticipated that the Project would result in any positive contributions to the objectives of any WFD water bodies.

7.4 Will the Project Lead to Deterioration in WFD Status of any WFD Waterbody in the Study Area?

- 7.4.1 Based on the assessment provided in this Appendix (within **Section 6**), no components or phases of the Project would lead to a deterioration in WFD Status in the Study Area.

7.5 Will the Project Compromise the Achievement of Good Status in any WFD Waterbody in the Study Area?

- 7.5.1 Based on the assessment provided in this Appendix (within **Section 6**), no components or phases of the Project would compromise the ability of any WFD waterbody to attain WFD target Status³⁸ in the Study Area.

7.6 Article 4.7 Considerations

- 7.6.1 On the basis that the Project would not result in deterioration to the WFD classifications of any of the screened in WFD water bodies nor prevent them from obtaining Good Ecological Status / Potential, no Article 4.7 consideration is required at this time.
- 7.6.2 The provisions of Article 4.7 would only apply where:
- failure to meet Good Groundwater Status, Good Ecological Status or Good Ecological Potential or to prevent deterioration in Status arises from new modifications to the physical characteristics of the waterbody or alteration of groundwater levels; or
 - failure to prevent deterioration from high to good overall Status of a surface waterbody is the result of new sustainable human development activities.

7.7 Statement of WFD Compliance

- 7.7.1 The assessment provided in this Appendix demonstrates that the Project is compliant with the objectives of the WFD. Therefore, there is no requirement for an Article 4.7 assessment.

³⁸ Not all waterbodies in the Study Area have a target of Good Status. **Appendix 7B: Detailed Water Environment Baseline Information** contains the target status of all WFD waterbodies in the Study Area.

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