

12. Hydrology, Flood Risk and Water Quality

Introduction

- 12.1 This Chapter reports the outcome of the assessment of likely significant environmental effects arising from the Project for Assessment in relation to Hydrology, Flood Risk and Water Quality. It also reports the likely significant environmental effects associated with the Proposed Scheme, which comprises the planning application.
- 12.2 The Chapter describes the technical consultation that has been undertaken during the EIA, the scope of the assessment and assessment methodology, and a summary of the baseline information that has informed the assessment.
- 12.3 In line with **Chapter 2: Approach to EIA**, the assessment reports on the likely significant environmental effects, the further mitigation measures required to prevent, reduce or offset any significant adverse effects, or further enhance beneficial effects. The conclusions are provided both in terms of the residual effects and whether these are considered significant. The assessment of effects takes into consideration both primary and tertiary mitigation (see **Chapter 2: Approach to EIA** for further details) and is informed by the EIA Scoping process (**Appendix 2.1 – 2.2**) and iterative scoping process where applicable.
- 12.4 This Chapter, and its associated **Figures 12.1 – 12.4**, is intended to be read as part of the wider ES with particular reference to the introductory Chapters of this ES (**Chapters 1 – 6**), as well as **Chapter 11: Biodiversity** and **13: Ground Conditions and Contamination**.
- 12.5 In addition, this Chapter should be read in conjunction with **Chapter 19: Assessment of Cumulative Effects**.

Summary of Consultation

- 12.6 **Table 12.1** provides an overview of the consultation that has been undertaken to inform the EIA, including the consideration of likely significant effects and the methodology for assessment.

Table 12.1: Summary of Consultation

Body/Organisation	Contact	Date/Form of Consultation	Summary of Consultation Outputs
Lead Local Flood Authority (LLFA), RBC	Service Manager Strategic Planning Economy	Email chain with RBC LLFA beginning 20 th May 2024.	A response is pending the appointment of a drainage engineer within RBC.
Lead Local Flood Authority (LLFA), BC	Team Leader – Development Management Department for Business,	Email chain with BC LLFA beginning 20 th May 2024.	Initial contact made with Development Management team, awaiting further response to discuss outline concepts for the drainage strategy.

Body/Organisation	Contact	Date/Form of Consultation	Summary of Consultation Outputs
Growth & Infrastructure			
Environment Agency (EA)	Project Manager & Planning Advisor, Green Growth Team	The EA have been provided with a copy of the flood modelling methodology via email on 6th June 2024. Comments have been provided prior to the EIA Scoping Opinion. Comments have been provided in response to draft WFD Screening Assessment.	The EA's assessment on the suitability of the modelling methodology is pending. The modelling will inform the baseline flood risk within the Assessment Boundary and therefore will provide a baseline for the assessment below. The EA welcome the production of WFD Assessments and encourage opportunities to contribute to WFD status increase. The EA recommend that potential groundwater impacts are screened in to the WFD assessments, water quality monitoring is implemented, appropriate survey work is undertaken to establish the ecological value of tributaries and enhancements are included that go above and beyond preventing deterioration. These comments have been addressed within the ES Chapter and the WFD Screening Assessment. The WFD Screening Assessment has been issued in draft to the EA prior to completion of this ES Chapter and comments regarding receptors to be scoped in have been received. This has been reflected in the assessment below.
United Utilities (UU)	Waste Water Engineer, Developer Services & Metering, Customer Services	8 th May 2024 Teams Call and email chain beginning 8 th May 2024.	Principles of the surface water strategy were agreed to be acceptable. UU confirmed their preference would be to adopt all surface water infrastructure but that it would be acceptable for Plots to be provided with private attenuation and

Body/Organisation	Contact	Date/Form of Consultation	Summary of Consultation Outputs
			discharge controls as part of an integrated site wide surface water strategy.
Greater Manchester Ecological Unit (GMEU)	Ecologist	Response received from Scoping Opinion via email, 18 th November 2024.	GMEU recommended that potential effects on aquatic ecology and watercourses are assessed. It was also recommended that the effects on non-statutory sites such as Hollins Vale and Pilsworth Fisheries are assessed. These have been addressed within the ES Chapter.

Scope of the Assessment

- 12.7 An EIA Scoping Report was submitted to BC and RBC on 17th October 2024, as presented as **Appendix 2.1**. A Scoping Opinion has not been received to date; however a number of consultation responses have been received and are provided in **Appendix 2.2**. A response to the comments in **Appendix 2.2** are provided in **Appendix 2.3**. This section provides an update on the scope of the assessment presented within this Chapter following submission of the EIA Scoping Report.

Effects Not Considered to be Significant

- 12.8 The following effects were not considered significant as part of the EIA Scoping Report and are not considered further in this Chapter:
- Decrease in water quality as a result of runoff during construction activities;
 - Increase in flood risk as a result of runoff during construction activities on the Site; and
 - Increased demand on water supply as a result of water use during construction activities
- 12.9 Following the EIA Scoping process the following additional effect(s) are now not considered significant and the evidence to support this determination is outlined below. These are equally relevant for the Proposed Scheme and the Project for Assessment.

Increase in fluvial flood risk to Less Vulnerable and More Vulnerable infrastructure as a result of areas of hardstanding within the floodplain during construction and operation

- 12.10 The alignments of Hollins Brook, Whittle Brook, Castle Brook, Brightly Brook / Pilsworth Clough and parts of the un-named water course on the eastern border of **Application Plot E** will be retained in their existing alignments within the Assessment Boundary. Their retention is accommodated within the Wetland Habitat Corridors and Landscape Mitigation as defined in **Figure 4.1**. The modelled extent of the 0.1% Annual Exceedance Probability (AEP) plus 35%

climate change event from Hydraulic Modelling completed by Tetra Tech (see **Flood Risk Assessment**) is contained within the Wetland Habitat Corridor.

- 12.11 As outlined in **Chapter 4: Development Specification – Project for Assessment** and **Chapter 5: Development Specification – Proposed Scheme**, no development of buildings will take place within either the Wetland Habitat Corridors or Landscape Mitigation Area. There will be limited development within the Wetland Habitat Corridors related to structural interventions to allow primary and secondary access routes across the Assessment Boundary, where necessary. This reflects the necessary flood mitigation. There is no intention to culvert the Main Rivers in the interests of flood management and biodiversity. There may be some very minor localized culverting of retained tributaries, but future designs will avoid this. Works required for primary and secondary access routes will not be undertaken within the channel of the Brook itself.
- 12.12 Therefore, an increase in fluvial flood risk to Less Vulnerable and More Vulnerable infrastructure as a result of areas of hardstanding within the floodplain during both construction and operation is not considered to be significant and will not be considered further in the EIA or reported in the ES. Further information in relation to the Proposed Scheme is provided in both the standalone **Flood Risk Assessment** and the **Drainage Strategy**, which supports the Application.

Impacts on retained peat resources from changes to the groundwater hydrological regime as a result of changes to hardstanding areas during operation

- 12.13 As reported in **Chapter 13: Ground Conditions and Contamination** (and **Appendix 2.4**), peat is recorded by the BGS interactive viewer across Assessment Plot EE and into Assessment Plot DD, **Figure 13.2**. There are no other areas of peat shown on the British Geological Survey online mapping. Tetra Tech was provided with two ground investigations reports, (1a. 2230520 – M60 Simister Island Interchange GIFR Logs, (Ian Farmers 2021) and CCG-C-23-14270, Ground Investigation at Unsworth Moss Farm, November, (CCG 2023)), which targeted the potential peat in these Assessment Plots. The reports identified traces of peaty material as a secondary constituent in four boreholes, (BH-N07, BH-N19, WS-N04 and WS-N04A) and peat is only recorded as pockets or traces as located by **Figure 13.5**.
- 12.14 There are some references to ‘traces of peat’ in the NCB boreholes in the northeast of the Assessment Boundary, (Assessment Plot BB) near Stock Nook Farm (BH 135 – 137) with one borehole (BH 137) describing a 1.15m thick presence of peat. However, this is from an openhole borehole record and as such was determined by chippings only and may be inaccurate. Similarly, in BH207, in Application Plot D, there is reference to a 2.50m thick ‘soft clay peat’, determined by openholing and which occurs in a low point onsite and as such is anticipated to be organic clay.
- 12.15 As such, no hydrological effects from disturbance are likely to occur. Further to this, the drainage strategy is designed to not interface with groundwater due to the presence of mine workings within the Assessment Boundary. The existing ground is largely clay which has low hydraulic conductivity properties. Therefore it is anticipated that the hydrological regime of the Assessment Boundary consists mainly of overland flows (via drainage channels) to the watercourses. The proposed drainage strategy will mimic this regime and therefore there are no anticipated changes on the hydrological regime that will impact the aquifer within the Assessment Boundary.

- 12.16 Therefore, impacts on retained peat resources from changes to the groundwater hydrological regime as a result of changes to hardstanding areas during operation is not considered to be significant and will not be considered further in the EIA or reported in the ES.

A decrease in groundwater quality in aquifers as a result of infiltration of surface waters through SuDS features during operation

- 12.17 The features within the drainage strategy are not designed to infiltrate and will not interface with groundwater due to the presence of mine workings within the Project for Assessment. There are no anticipated impacts on water quality within the aquifer from the SuDS features.
- 12.18 Therefore, a decrease in groundwater quality in aquifers as a result of infiltration of surface waters through SuDS during operation is not considered to be significant and will not be considered further in the EIA or reported in the ES.

Impacts on Less Vulnerable and More Vulnerable infrastructure from an increase in flood risk due to potential filling of existing drainage channels during operation

- 12.19 The purpose of the existing channels / minor tributaries is to convey flows from the agricultural fields to the watercourse. Sections of minor tributaries of brooks outside of the Landscape Mitigation only, may require removal. However, the proposed drainage strategy will mimic this regime and therefore there are no anticipated impacts on flood risk from the removal of these channels.
- 12.20 Therefore, impacts on Less Vulnerable and More Vulnerable infrastructure from an increase in flood risk due to potential filling of existing drainage channels during operation is not considered to be significant and will not be considered further in the EIA or reported in the ES.

Flood risk increase to Less Vulnerable and More Vulnerable infrastructure as a result of flooding from Off-Site reservoirs during construction and operation

- 12.21 The extent of EA modelled reservoir flooding within both wet and dry day events¹ lies entirely within the Wetland Habitat Corridor adjacent to Whittle Brook as defined on **Figure 4.1**, where works are limited to those outlined above. Therefore there are no anticipated impacts on the flood risk resulting from off-site reservoir flooding. Therefore, flood risk increase to Less Vulnerable and More Vulnerable infrastructure as a result of flooding from Off-Site reservoirs during construction and operation is not considered to be significant and will not be considered further in the EIA or reported in the ES.

Effects Considered Likely to be Significant

- 12.22 The following effects (**Table 12.2**) were considered likely to be significant and are reported within this Chapter. The following have been added to the overall scope since the completion of the EIA Scoping Report in response to comments by GMEU and EA as set out above:
- Changes to biological and morphological features within the Main Rivers from structures within the Wetland Habitat Corridors;

¹ Reservoir Flood Extents - Wet Day (National) and Reservoir Flood Extents - Dry Day (National), Environment Agency, 2024

- Changes to chemical status of the groundwater body from works that interface with the water table;
- Changes to quantitative status of the groundwater body from foundations and structures that interface with the groundwater flow; and
- Decrease in water quality due to disturbance of poor quality peat deposits.

Table 12.2: Effects Considered Likely to be Significant

Likely Significant Effect	Receptor(s)	Applicable Development Stage	Spatial Plots
Flood risk as a result of flooding from failure of On-Site attenuation ² features installed as part of drainage strategy	Less Vulnerable and More Vulnerable infrastructure	Construction and Operation	All Spatial Plots
Changes to biological and morphological features within the Main Rivers from structures within the Wetland Habitat Corridors	Main Rivers Hollins Vale SBI / LNR and Pilsworth Fisheries SBI	Construction and Operation	All Spatial Plots excluding AAA, BBB, CCC and C
Changes to chemical status of the groundwater body from works that interface with the water table	Northern Manchester Carboniferous Aquifers (Secondary A Aquifer)	Construction	All Spatial Plots
Decrease in water quality due to disturbance of poor quality peat deposits	All watercourses and waterbody receptors such as ponds within the Assessment Boundary. Downstream waterbodies within the area of interest (including Hollins Brook and River Roch)	Construction	All Spatial Plots
Changes to quantitative status of the groundwater body	Northern Manchester Carboniferous Aquifers (Secondary A Aquifer)	Operation	All Spatial Plots

² The size of the on-site attenuation is no longer anticipated to be of a scale classified as a reservoir, there this effect has been updated since the completion of the EIA Scoping Report.

Likely Significant Effect	Receptor(s)	Applicable Development Stage	Spatial Plots
from foundations and structures that interface with the groundwater flow			
Decrease in water quality as a result of runoff	All watercourses and waterbody receptors such as ponds within the Proposed Scheme. Downstream waterbodies within the area of interest (including Hollins Brook and River Roch)	Operation	All Spatial Plots
Increase in surface water flood risk as a result of increased overland flows from changes to topography and increased areas of hardstanding	Less Vulnerable and More Vulnerable infrastructure	Operation	All Spatial Plots
Increased demand on existing drainage networks and Waste Water Treatment Works	Waste Water Treatment Works	Operation	All Spatial Plots
Increased demand on water resources and associated infrastructure	Aquifer, reservoirs and existing potable water infrastructure	Operation	All Spatial Plots

Assessment Methodology

Legislative Framework, Policy and Guidance

12.23 The following legislation and policy have informed the assessment of effects within this Chapter:

- National Planning Policy Framework (NPPF) (2024)¹;
- Flood Risk and Coastal Change Planning Policy Guidance (2022)²;
- Water Environment (Water Framework Directive) (England and Wales) Regulations 2017³;

- Flood and Water Management Act 2019⁴; and
- Reservoirs Act 1975.

12.24 The following guidance has informed the assessment of effects within this Chapter:

- 2015 CIRIA SuDS Manual (C753F)⁵;
- DEFRA Non-statutory technical standards for sustainable drainage systems⁶;
- UU S104 SuDS guidance⁷;
- Rochdale Borough Council (RBC) Local Plan Adopted 2016⁸;
- Bury Borough Council (BC) Local Plan (Consultation closed May 2024)⁹;
- RBC Flood Risk Management Strategy¹⁰;
- BBC Local Flood Risk Management Strategy¹¹; and
- Oldham and Rochdale Urban Design Guide Supplementary Planning Document¹².

Defining the Study Area

12.25 The study area has been defined as the Assessment Boundary with the addition of downstream watercourses and infrastructure receptors adjacent to and downstream of the Assessment Boundary. The downstream extent included within the assessment has been defined by the extent of the fluvial modelling agreed with the EA. This can be seen in **Figure 12.1**.

Background Studies to Inform the ES / Establishing the Baseline

12.26 **Table 12.3** summarises all surveys and analysis undertaken to inform the assessment presented within this Chapter.

Table 12.3: Background Surveys and Analysis

Study / Survey / Analysis / Evaluation	Overview	Date of Completion
Site Walkover	A site walkover was undertaken in May 2024 for a visual inspection of the watercourses to inform where further surveys were required. Areas of the channel could not be viewed due to the extent of vegetation; however, it is considered that the resultant model and assessments will provide an appropriate level of accurateness without the need for further survey in these areas prior to planning application determination.	May 2024
Channel survey	Channel topography surveys were completed to inform the fluvial model	September 2024

Study / Survey / Analysis / Evaluation	Overview	Date of Completion
Structures survey	Surveys of instream structures were completed in September 2024 to inform the fluvial model. A further survey was carried out in February 2025 to further survey and take dimensions of the culvert beneath Birch Services and the outfall on Whittle Lane to inform the hydraulic model.	September 2024 and February 2025.
Fluvial Modelling Report	A 2D hydraulic model has been produced to determine the extents and depths of flooding in both present day and in future climate scenarios. The extent of the model has covered Whittle Brook, Castle Brook and Brightley Brook including Hollins Brook up to a downstream boundary	March 2025
Flood Risk Assessment	A Flood Risk Assessment has been produced to determine the risk to the Site from flooding in both the present scenario and following implementation of the Proposed Scheme. Off-site risks of flooding have also been considered as part of the FRA. The FRA has considered the compliance of the Proposed Scheme with relevant policy.	April 2025
Drainage Strategy	A separate Surface Water and Foul Drainage Strategy for the Proposed Scheme has been produced detailing how the proposed drainage will manage surface water and foul flows in compliance with local and national policy.	April 2025
Water Framework Directive Screening Assessment	A WFD Screening Assessment has been produced to determine whether the construction and implementation of the Project for Assessment will cause changes to the ecological, chemical and morphological WFD status of the receiving watercourses within the Assessment Boundary. Risks to off-Site waterbody receptors have also be considered as part of the assessment. The WFD Screening Assessment has been prepared for the Project for Assessment, to ensure coordination with the EIA as required by the EIA Regulations. This assessment will consider the compliance of the Proposed Scheme with relevant legislation.	April 2025

Assessment Process

12.27 The assessment has been based on the available plans and the studies mentioned above as outlined in **Table 12.3**.

12.28 The documents listed below have been produced in support of the Proposed Scheme, however, conclusions and design principles applied during the assessments for the Application have been assumed to apply to the Project for Assessment within the ES:

- Flood Risk Assessment;
- Water Framework Directive Screening Assessment; and
- A Drainage Strategy for Surface Water and Foul.

12.29 The fluvial modelling has been undertaken for the wider Assessment Boundary.

12.30 Assumptions based on current industry best practice have been used to determine the proportion of hardstanding areas for the drainage calculations within the **Drainage Strategy**.

12.31 For the purposes of the assessment, effects on the following will be assessed:

- Flood Risk:
 - The modelled 0.1% plus 35% climate change allowance (which is representative of the central 2080s epoch) for fluvial flooding is considered within the design of the Proposed Scheme. This fluvial flooding scenario will be considered in the assessment of construction and operational impacts.
 - 1% AEP plus 45% climate change allowance surface water flood risk scenario will be considered during both the construction and operational stages for surface water.
 - Flood risk from failure of on-site attenuation will be considered in all scenarios up to the 1% AEP plus 45% climate change allowance scenario for surface water flood risk.
- Water Quality
 - For all waterbody receptors identified within the baseline, including the groundwater body beneath the Assessment Boundary.
 - Downstream effects on quality will be considered within the area identified in **Figure 12.1**.
 - The assessment will consider effects on the chemical and biological quality in both low flow and high flow scenarios.
- Morphology
 - This will be assessed for the Whittle Brook (Irwell) WFD Waterbody only.
 - Changes to river stage are considered as well as localised changes in flow dynamics and depositional regimes.
 - This will be assessed for both low flow and high flow scenarios.

- Foul water infrastructure
 - The effects of the Project for Assessment will be considered for Bury WwTW and associated infrastructure that will connect the site to the treatment works.
 - The additional loadings on the network will be considered for full occupancy of the Project for Assessment.
- Water resources
 - The designated aquifer beneath the Assessment Boundary, local reservoirs and infrastructure that connects the development to these supplies will be considered.
 - The additional demand on the network will be considered for full occupancy of the of the Project for Assessment.

Reporting of the Environmental Effects and Significance Criteria

12.32 The assessment of likely significant environmental effects as a result of the Project for Assessment has taken into account the construction and operational stage. The following sections define the approach adopted within the assessment for the determination of sensitivity (or value/importance), magnitude of change (or impact), the level of effect and significance.

12.33 In the absence of 'industry standard' significance criteria for the consideration of hydrology, flood risk and water resources impacts, a qualitative approach, based upon available knowledge, experience and professional judgement, has been employed.

Determining Sensitivity of Receptor

12.34 The criteria for sensitivity have been developed based on a hierarchy of factors relating to quality of the aquatic and geological environment including international and national designations, water and soil quality information, waterbody WFD status, consultations, site visits, and the professional judgement of the assessment team.

12.35 The sensitivity of affected receptors has been considered on a scale of **high, medium, low or negligible**. The sensitivity of each receptor is shown in **Table 12.4**.

Table 12.4: Sensitivity of Receptors

Sensitivity	Criteria	Example Criteria	Receptor
High	Attribute has a high quality and rarity on a regional or national scale.	• Water Framework Directive (WFD) Class 'High'. • Site protected/designated under EC or UK habitat legislation (e.g., Special Area of Conservation (SAC), Special Protection Area (SPA), Site of Special Scientific Interest (SSSI), Drinking Water Protection Zone (DWPZ), Ramsar site, and	• Existing potable water infrastructure and aquifers and reservoirs used for water abstraction. • Waste Water Treatment Works

Sensitivity	Criteria	Example Criteria	Receptor
		Freshwater Fishery/Shellfish Water). • Flood Zone 3b (Functional Floodplain) area at risk from a flood event less than or equal to the 3.33% AEP event. • EC Bathing Waters Directive Beach class – ‘Higher’ classification. • Principal or Secondary Aquifer with High vulnerability to pollution. • Source Protection Zone. • ‘Highly Vulnerable’ or ‘Essential Infrastructure’ Flood Risk Classification³. • Wastewater treatment works. • Potable water infrastructure.	
Medium	Attribute has a high quality and rarity on a local scale.	• Water Framework Directive (WFD) Class 'Good'. • Main river >10m wide. • Cyprinid Fishery (commercial). • Watercourse that supports species protected under EC or UK habitat legislation but is not a designated site. • Flood Zone 3a (High probability) area at high risk from a river flood event less than or equal to the 1% AEP event. • EC Bathing Waters Directive Beach class – ‘Minimum’ classification. • Principal or Secondary Aquifer with Medium vulnerability to pollution. • ‘More Vulnerable’ Flood Risk Classification.	• Downstream Main Rivers within the area of interest (River Roch) • Downstream hydraulically connected non-statutory sites (Hollins Vale and Pilsworth Fisheries) • More Vulnerable infrastructure (residential properties within the Assessment Boundary, Hotel at Moto Birch Services) • Northern Manchester Carboniferous Aquifers (Secondary A Aquifer)
Low	Attribute has a medium quality and	• Water Framework Directive (WFD) Class ‘Moderate’. • Main river <10m wide.	• Main Rivers within the Project for Assessment (Whittle Brook, Castle Brook,

³ Department for Levelling Up, Housing and Communities. (2012). National Planning Policy Framework Annex 3: Flood Risk Vulnerability Classification. [Accessed from: <https://www.gov.uk/guidance/national-planning-policy-framework/annex-3-flood-risk-vulnerability-classification/>].

Sensitivity	Criteria	Example Criteria	Receptor
	rarity on a local scale.	• Ordinary watercourse >5m wide. • Flood Zone 2 (Medium probability) area at medium risk from a river flood event between the 1% AEP and 0.1% AEP Event. • Principal or Secondary Aquifer with Low vulnerability to pollution. • 'Less Vulnerable' Flood Risk Classification.	• Brightley Brook, Pilsworth Clough, Unnamed watercourse - tributary of Whittle Brook) • Downstream Main Rivers within the area of interest (Hollins Brook) • Less Vulnerable infrastructure (commercial properties within the Site, Heywood Distribution Park, Moto Birch Services, Golf Club).
Negligible	Attribute has a low quality and rarity on a local scale.	• WFD Class 'Poor'. • No fishery of any type. • Unclassified field drain which is therefore likely to be <5m wide. • Managed waterbodies that are small / managed for recreational purposes. • Flood Zone 1 (Low probability) area at low risk from a river or sea flood event greater than the 0.1% AEP event. • EC Bathing Waters Directive Beach class– Fail. • Unproductive Aquifer. • 'Water-compatible development' Flood Risk Classification	• Ordinary watercourses and waterbody receptors such as ponds and drainage ditches within the Proposed Scheme

Determining the Magnitude of Change

12.36 The magnitude of change has been considered as the change experienced from the current baseline conditions at the sensitive receptor and has been considered on a scale of **large, medium, small** or **negligible**. The magnitude of change is based on professional judgement and the example criteria shown in **Table 12.5** are indicative.

Table 12.5: Magnitude of Change

Magnitude	Example Criteria
Large	- Substantial change in the water body's existing physico-chemical elements and the addition of new failing/passing chemical elements resulting in a substantial change in current WFD physico-chemical status. - A substantial change in hydromorphological characteristics of the water feature which would alter the water body's existing WFD ecological status. Project largely conflicts or aligns with the delivery of more than one River Basin Management Plan (RBMP) mitigation measures on a WFD water body. - Direct net gain or loss of Flood Zone 3b and indirect change in flood risk elsewhere. - Change in areas at risk of surface water flooding in a 3.3% AEP event within or outside of the Assessment Boundary where receptors are at risk. - A pollution incident or release during construction or operation of a development likely to result in a major pollution incident.
Medium	- Medium change in the water body's physico-chemical elements resulting in a medium change in current WFD physico-chemical status. - A medium change in hydromorphological characteristics of the water feature which would affect the water body's existing WFD ecological status. - Project partially conflicts or aligns with the delivery of one RBMP mitigation measure on a WFD water body. - Direct loss or gain of Flood Zone 3a and indirect changes in flood risk elsewhere. Increase in areas at risk of surface water flooding in a 1% AEP event within or outside of the Assessment Boundary. - A pollution incident or release during construction or operation of a development likely to result in a moderate or minor pollution incident.
Small	- Small change in water quality. - Change in the water body's physico-chemical elements but insufficient to change the current WFD chemical status. - A slight change in the hydromorphological characteristics but insufficient to change the current WFD ecological status. - Direct loss or gain of Flood Zone 2 and indirect increase in flood risk elsewhere. - Changes in areas at risk of surface water flooding in a 0.1% AEP event within or outside of the Assessment Boundary.
Negligible	- Very low levels of pollution from discharges insufficient to significantly affect water quality. - Very low risk of pollution from accidental spillages. - No discernible change in the water body's chemical elements. Therefore, no discernible change to WFD chemical status of waterbody.

Magnitude	Example Criteria
	- No discernible movement towards or away from the target WFD chemical status. - No discernible cause and effect between the project and RBMP mitigation measures. - No discernible loss of flood zone (i.e. this would involve only land take/structures within Zone 1). - No discernible change in areas at risk of surface water within or outside of the Assessment Boundary.

Determining the Level of Effect

12.37 The level of effect has been informed by the magnitude of change due to the Project for Assessment and the evaluation of the sensitivity of the affected receptor. The level of effect has been determined using professional judgement and **Table 12.6** has been a tool which has assisted with this process.

12.38 Whilst **Table 12.6** provides ranges, the level of effect is confirmed as a single level and not a range, informed by professional judgement. For each effect, it has been concluded whether the effect is '*beneficial*' or '*adverse*'.

Table 12.6: Matrix to Support Determining the Level of Effect

Magnitude of change (or impact)	Sensitivity (or value, importance, etc.)				
		High	Medium	Low	Negligible
	Large	Major	Moderate to Major	Minor to Moderate	Negligible
	Medium	Moderate to Major	Moderate	Minor	Negligible
	Small	Minor to Moderate	Minor	Negligible to Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

12.39 The following terms have been used to define the level of the effects identified and these can be '*beneficial*' or '*adverse*':

- **Major effect:** where the Project for Assessment / Proposed Scheme is likely to cause a considerable change from the baseline conditions and the receptor has limited adaptability, tolerance or recoverability or is of the highest sensitivity;
- **Moderate effect:** where the Project for Assessment / Proposed Scheme is likely to cause either a considerable change from the baseline conditions at a receptor which has a degree of adaptability, tolerance or recoverability or a less than considerable change at a receptor that has limited adaptability, tolerance or recoverability;

- **Minor effect:** where the Project for Assessment / Proposed Scheme is likely to cause a small, but noticeable change from the baseline conditions on a receptor which has limited adaptability, tolerance or recoverability or is of the highest sensitivity; or where the Project for Assessment / Proposed Scheme is likely to cause a considerable change from the baseline conditions at a receptor which can adapt, is tolerant of the change or/and can recover from the change; and
- **Negligible:** where the Project for Assessment / Proposed Scheme is unlikely to cause a noticeable change at a receptor, despite its level of sensitivity or there is a considerable change at a receptor which is not considered sensitive to a change.

12.40 The duration of the effect has been assessed as either ‘short-term’, ‘medium-term’ or ‘long-term’. Short-term is considered to be up to 1 year, medium-term is considered to be between 1 and 10 years and long-term is considered to be greater than 10 years.

Determining Significance

- 12.41 For each effect, a statement has been made as to whether the level of effect is ‘**Significant**’ or ‘**Not Significant**’. This determination has been based on professional judgement and/or relevant guidance/legislation where applicable.
- 12.42 Significance has only been concluded for residual effects (i.e. following the identification of secondary mitigation).

Baseline Conditions

Water Features

- 12.43 In the north, in Plots A, B and D, Brightley Brook and Pilsworth Clough⁴ flow east to west and confluence within Plot B to form Brightley Brook. In the east, bounding Plots BB, F, E and CC, an unnamed Ordinary Watercourse flows in a southerly direction out of the Assessment Boundary. The unnamed watercourse confluent with Whittle Brook before flowing northward back through between Plot D and Plot DD. Castle Brook is located to the west, within Plot EE, FF and DD and flows northwards. Castle Brook confluent with Whittle Brook, which then further downstream confluent with Brightley Brook at the boundary of Plot D, DD and FF to form Hollins Brook, which flows west out of the Assessment Boundary.
- 12.44 South of the Assessment Boundary is an additional Ordinary Watercourse, Mere Brook (alternatively named Langley Brook), which flows into the Whittle Brook.
- 12.45 The location of these watercourses can be seen in **Figures 12.1** and **12.2**. The Hollins Brook Catchment is shown on **Figure 12.3**.
- 12.46 During site surveys, lateral inflows from drainage structures were observed at Moss Hall Road on Brightley Brook, the origin of these is currently unknown. To the north of the Assessment Boundary, Pilsworth Reservoir is located adjacent to Plot D.
- 12.47 A review of Defra’s online ‘Magic’ mapping⁵ indicates the Assessment Boundary is underlain by Unproductive Superficial deposits and by bedrock deposits which are classified as

⁴ This is the assumed name.

⁵ MAGIC map, 2024, DEFRA, [Accessed 04/07/2024], <https://magic.defra.gov.uk/MagicMap.aspx>

Secondary A. It also shows that the Assessment Boundary is not located within a Source Protection Zone (SPZ).

- 12.48 The 'Magic' mapping also shows that the groundwater vulnerability to pollution within the Assessment Boundary ranges from Low to Medium-High.

Flood Risk

- 12.49 The ground levels within the Assessment Boundary range from approximately 85mAOD to 134mAOD. The generalised topography is higher elevations in the north east with the lower areas in the north west. Throughout the west of Assessment Boundary there are areas of elevations of approximately 90 – 99mAOD between which the valleys for Whittle Brook and Castle Brook fall.
- 12.50 The Assessment Boundary has areas of Flood Zone 2 and 3 located along Hollins Brook, Whittle Brook and Brightley Brook. The extent of Flood Zone 2 is considered to be the floodplain. This is discussed further in the **Flood Risk Assessment**⁶ and is shown in **Figure 12.4**.
- 12.51 Modelling produced for the Assessment Boundary identifies areas at risk of flooding in 3.33% AEP, 1% AEP and 0.1% AEP events along all watercourses (Whittle Brook, Castle Brook, Brightley Brook, Pilsworth Clough and the unnamed watercourse adjacent to Plot BB and E).
- 12.52 There are areas of surface water flooding indicated in mapping⁷ throughout the Assessment Boundary. These are mostly aligned with the previously identified watercourses, topographical depressions and existing ponds and ditches. These areas of pooling are common in, but not confined to, the east of the Assessment Boundary.
- 12.53 There are areas identified as at risk of reservoir flooding¹⁰ during dry and wet days along Hollins Brook, Brightly Brook and the northernmost reaches of Whittle Brook. These extents are located within the Wetland Habitat Corridor and Landscape Mitigation in Plots FF, DD and D and outside of the Assessment Boundary.
- 12.54 A review of the Long-Term Flood Risk website¹⁰ indicates that groundwater flooding is considered to be unlikely in this area, therefore the risk of groundwater flooding is considered to be low.
- 12.55 There are areas of industrial and commercial use (less vulnerable) within and adjacent to the Assessment Boundary, and residential areas (more vulnerable) within and adjacent that are considered receptors of flood risk.

Water Quality

- 12.56 The Assessment Boundary is located within a Water Framework Directive (WFD) surface body catchment, the Whittle Brook (Irwell) catchment. The water quality can be inferred from the ecological status of the waterbody as a higher ecological classification is indicative of better water quality. This has an ecological WFD classification of moderate.

⁶ Flood Risk Assessment 784-B048805 P01, Tetra Tech, 2024

⁷Check Your Long Term Flood Risk, 2024, Environment Agency, [Accessed 04/07/2024], <https://check-long-term-flood-risk.service.gov.uk/risk>

- 12.57 The Assessment Boundary is also located within the Northern Manchester Carboniferous Aquifers WFD groundwater catchment. This has an overall classification of Poor status, this is due to the chemical status of the groundwater being poor quality.

Drainage (Surface and Foul)

- 12.58 It is suspected that a highway drain is present beneath Moss Hall Road, however there are no drainage records available. It is anticipated that the existing developments within the Assessment Boundary, including Birch Industrial Park, have their own dedicated surface water network, however their details and outfalls are unknown. Two existing culverts have been recorded adjacent to Moss Hall Road with an outfall into Brightley Brook, however the nature of these is not confirmed at this time.
- 12.59 There are existing foul treatment plants located across the Assessment Boundary, however details of these are currently unknown. It is assumed that the existing developments within the Assessment Boundary, including Birch Industrial Park, have their own dedicated foul water infrastructure and treatment system, however their details and outfalls are unknown at this time. There are no other known foul water assets recorded within the public highways nor within the Assessment Boundary.
- 12.60 Bury Wastewater Treatment Works is located to the west of the Assessment Boundary, whilst the sewer network is along Hareshill Road to the north. There is no information available on the existing capacity of the Bury Wastewater Treatment Works.

Water Availability

- 12.61 There are potable water connections servicing the Pike Fold Golf Club and Castle Brook Farm located in the west of the Assessment Boundary. These connections flow from the west, crossing the M66 and following the route of existing access roads. There is a further potable water connection to the north of the Assessment Boundary that flows in a westerly direction and connects to Pilsworth Cottages in the north-west.

Future Baseline

- 12.62 There are areas of surface water flood risk across the majority of the Assessment Boundary. It is considered that with the effects of climate change, these areas of surface water flood risk will expand in the future. Peak rainfall climate change allowances therefore need to be considered. For surface water flooding within the area known as the Irwell Management Catchment, the EA guidance on climate change allowances applies an upper end allowance of up to 45% on a 1% AEP rainfall event in the 2070s epoch. The Project for Assessment lifetime is expected to be >100 years therefore using the upper end allowance is considered appropriate.
- 12.63 Further to this, the areas of Flood Zone 2 and 3 may expand in future due to the impacts of climate change. The EA guidance on climate change allowances applies a central allowance of up to 35% to Irwell Management Catchment peak river flow in the 2080s epoch.
- 12.64 Due to the existing greenfield nature of the Project for Assessment, it is considered that the future baseline for wastewater infrastructure, SPZs, and groundwater bodies will remain unchanged.

12.65 In the future, climate change and population growth will increase the pressure on water availability. Current climate change projections for the UK suggest that by the 2050s, under the medium emissions scenario, summer temperatures may increase, and summer rainfall may decrease. Short duration droughts (12-18 months) are likely to become more frequent, so that droughts like 1976 could be more common despite the increased resilience of public water supply and more winter storage⁸. In future, the Project for Assessment will remain at the current water usage and therefore will not contribute to increased water scarcity directly, however water scarcity in the general area may increase due to the impacts of climate change and increased local demand. **Chapters 4 and 5** considers the effects of the Project for Assessment on climate change (climate change mitigation) and how the Project for Assessment has been designed to be resilient to the changing climate.

12.66 The location of sensitive receptors can be seen in **Figure 12.2** and are discussed below.

Primary and Tertiary Mitigation

Construction Stage

12.67 The following primary and tertiary mitigation which has been evaluated as part of the construction stage assessment is outlined in the table below. It is worth noting that those which are relevant to the Proposed Scheme can be controlled through **Volume 3: Environmental Management Plan**, although those that apply to the Project for Assessment will be a matter for when planning applications are made for those relevant areas.

Table 12.7: Primary and Tertiary Mitigation to Inform Assessment of Construction Effects

Mitigation	Relevant to	
	Project for Assessment	Proposed Scheme
Construction will take place in phases meaning temporary drainage infrastructure will be installed for each Plot/s as required	✓	✓
Temporary surface water drainage will be installed as necessary to mitigate flood risk and sediment loading and, where possible will align with the permanent drainage solution	✓	✓
Surface Water Drainage Strategy – attenuation features designed and constructed in accordance with appropriate guidance (UU S104 SuDS guidance, CIRIA SuDS Manual, local LLFA guidance). This includes the design of a freeboard, meaning that the features will be designed to accommodate flows over the design 1% AEP + 45% climate change design event.	✓	✓

⁸ The case for change – current and future water availability Report – GEHO1111BVEP-E-E, Environment Agency, 2011.

Mitigation	Relevant to	
	Project for Assessment	Proposed Scheme
Potable water infrastructure upgrades along Pilsworth Road to the UU water main (Infrastructure Area AAAA) would occur during the upgrades to Pilsworth Road (as well as off-site upgrades to foul water	✓	✓

Operational Stage

12.68 The following primary and tertiary mitigation which has been evaluated as part of the operational stage assessment is outlined in the **Table 12.8** below.

Table 12.8: Primary and Tertiary Mitigation to Inform Assessment of Operational Effects

Mitigation	Relevant to	
	Project for Assessment	Proposed Scheme
The alignments of Hollins Brook, Whittle Brook, Castle Brook, Brightley Brook / Pilsworth Clough and parts of the un-named water course on the eastern border of Application Plot E will be retained in their existing alignments within the Wetland Habitat Corridors and Landscape Mitigation (as shown in Figures 4.1 and 5.1).	✓	✓
No development of buildings within the Landscape Mitigation (as shown in Figures 4.1 and 5.1 and detailed in Chapters 4 and 5).	✓	✓
Development within the Wetland Habitat Corridors will be limited to structural interventions to allow primary and secondary access routes across the Assessment Boundary, where necessary (as shown in Figures 4.1 and 5.1 and detailed in Chapters 4 and 5).	✓	✓
Flood Risk Management – Surface Water Strategy (as detailed in Chapters 4 and 5).	✓	✓
Foul Drainage Strategy (as detailed in Chapters 4 and 5).	✓	✓
Potable water infrastructure upgrades along Pilsworth Road to the UU water main (as shown in Figures 4.1 and detailed in Chapter 5: Development Specification – Project for Assessment).	✓	✓ This is located outside of the boundary of the Proposed Scheme

Mitigation	Relevant to	
	Project for Assessment	Proposed Scheme
		but is required for the development to progress.
Water consumption rates of 110l/p/d for homes	✓	✗

Assessment of Effects, Secondary Mitigation and Residual Effects

Construction Stage

Flood risk as a result of flooding from failure of On-Site attenuation features installed as part of drainage strategy [Project for Assessment and Proposed Scheme]

- 12.69 The attenuation for the Proposed Scheme takes the form of large basins that will hold flows and discharge at a controlled rate to the watercourses within the Assessment Boundary. Due to the size of the development, these attenuation features are large in size (however these will be sized at 10,000m³ or less for standalone features or cumulatively less than 10,000 m³ for a hydraulically linked series of features and are therefore not considered to be reservoirs). There is a risk of a breach from these features releasing large volumes. The resultant flooding from this has the potential to have an adverse effect on the existing Less Vulnerable and More Vulnerable infrastructure receptors within the Assessment Boundary and Application Boundary through overland flows. This includes infrastructure that will be demolished but is present during construction phasing.
- 12.70 Less Vulnerable infrastructure receptors to flood risk include commercial properties within the Assessment Boundary, Heywood Distribution Park, Moto Birch Services Area and the Pike Fold Golf Club. More Vulnerable infrastructure receptors to flood risk include residential properties within the Assessment Boundary and the Hotel (at Moto Birch Services). These are defined on **Figure 12.2**.
- 12.71 During construction, temporary surface water drainage will be installed as necessary to mitigate flood risk. This temporary drainage will be subject to good site working practices and will be suitable to manage the surface water flows during construction. Further to this, the Proposed Scheme will be developed in phases and the drainage installation will be appropriate to manage the flows for each phase as it is developed. Attenuation features will be designed to UU S104 SuDS guidance, CIRIA SuDS Manual as well as local LLFA guidance. Therefore, by designing to these standards, the risk of a breach will be low, and the phased approach will mean that basins will only attenuate volumes once completed and for the phase that it is designed to and therefore it is not likely to be exceeded.
- 12.72 These principles will also be applied to the Project for Assessment.

Project for Assessment

- 12.73 The sensitivity of the Less Vulnerable and More Vulnerable infrastructure adjacent to and within the Assessment Boundary is considered to be low to medium, depending on the nature of the infrastructure receptor outlined above. The magnitude of change is considered

to be negligible. Therefore, there is likely to be a direct, temporary, long-term, adverse effect which is considered to be negligible.

Proposed Scheme

- 12.74 The effects of flood risk for Less Vulnerable and More Vulnerable infrastructure adjacent to and within the Application Boundary is the same as that reported for the Project for Assessment.

Secondary Mitigation or Enhancement

- 12.75 No secondary mitigation or enhancement is required/has been identified, provided the drainage strategy as set out in **Table 12.5** is implemented.

Residual Effect

- 12.76 In the absence of secondary mitigation the residual effects for Less Vulnerable and More Vulnerable infrastructure are the same as that reported in the pre-mitigation scenario.

Significance

- 12.77 This effect is considered to be **Not Significant** for the Project for Assessment and the Proposed Scheme.

Changes to biological and morphological features within the Main Rivers from structures within the Wetland Habitat Corridors [Project for Assessment and Proposed Scheme]

- 12.78 Works within the Wetland Habitat Corridors to facilitate crossings of the Main Rivers through the Assessment Boundary and the construction of outfalls for the Drainage Strategy have the potential to impact the waterbodies. Outfalls have the potential to cause changes to flow dynamics, and therefore morphological features of the watercourse, as well as potential impacts on water quality affecting the chemical and biological receptors within the watercourse. These potential impacts have been determined for the Project for Assessment within the **WFD Screening Assessment**.
- 12.79 These potential impacts relate to the installation of outfalls specifically within the Wetland Habitat Corridors. Throughout the Assessment Boundary these are only likely to occur at select small locations as needed therefore there is a risk of potential impacts on the WFD status of the water body within the Assessment Boundary and downstream waterbodies that are hydraulically linked. The impacts of outfalls on the flow dynamics and water quality have the potential to cause impacts on the biological and morphological features. Due to the expected size of outfalls compared to the watercourse, it is anticipated that these will be a long-term, medium impact.

Project for Assessment

- 12.80 The sensitivity of the Main Rivers within the Project for Assessment, Whittle Brook and Brightley Brook are considered to be low. The magnitude of change has the potential to be medium. Therefore, there is likely to be a direct, permanent, long-term, adverse effect which is considered to be minor.
- 12.81 The sensitivity of the Main Rivers downstream of the Project for Assessment, Hollins Brook and River Roch, is considered to be low and medium, respectively. The magnitude of change will be less than within the Assessment Boundary therefore has the potential to be small. Therefore, there is likely to be a direct, permanent, long-term, adverse effect but is considered to be minor.

- 12.82 The sensitivity of Hollins Vale and Pilsworth Fisheries which are downstream of the Project for Assessment but hydraulically linked, is considered to be medium. The magnitude of change will be less than within the Assessment Boundary therefore has the potential to be small. Therefore, there is likely to be a direct, permanent, long-term, adverse effect but is considered to be minor.

Proposed Scheme

- 12.83 The changes to biological and morphological features within the Main Rivers is the same as that reported for the Project for Assessment.

Secondary Mitigation or Enhancement

- 12.84 Secondary mitigation will be in place in the form of WFD assessments carried out on a Plot-by-Plot basis to further refine the potential effects based on detailed information and to present detailed mitigation measures when outfalls are proposed within the Wetland Habitat Corridors.
- 12.85 Measures may include material management, determination of outfall location, and detailed studies to ensure management of effects at the catchment level.
- 12.86 For the Proposed Scheme, the WFD assessments will be managed by planning condition. It is assumed that the same or similar conditions will apply to the Project for Assessment, although this will be a matter for when planning applications are made for those relevant areas.

Table 12.9: Summary of Secondary Mitigation for Construction Stage

Mitigation	Person Responsible	Secured by	Relevant to	
			Project for Assessment	Proposed Scheme
WFD Assessment and implementation of recommended mitigation on a Plot-by-Plot basis at Reserved Matters	Applicant / future applications	Planning Condition	✓	✓

Residual Effect

- 12.87 Following implementation of secondary mitigation, it is expected that the residual effect for the Main Rivers and downstream hydraulically connected sites is likely to be negligible.

Project for Assessment

- 12.88 The sensitivity of the Main Rivers within the Project for Assessment, Whittle Brook and Brightley Brook are considered to be low. The sensitivity of the Main Rivers downstream of the Project for Assessment, Hollins Brook and River Roch, is considered to be low and medium, respectively. The sensitivity of Hollins Vale and Pilsworth Fisheries which are downstream of the Project for Assessment but hydraulically linked, is considered to be medium. The magnitude of change following mitigation is negligible. Therefore, there is likely to be a direct, permanent, long-term, adverse residual effect which is considered to be negligible.

Proposed Scheme

12.89 The effects on the Main Rivers is the same as that reported for the Project for Assessment.

Significance

12.90 Following the implementation of the secondary mitigation, this effect is considered to be **Not Significant** for the Project for Assessment and the Proposed Scheme.

Changes to chemical status of the groundwater body from works that interface with the water table [Project for Assessment and Proposed Scheme]

12.91 Works throughout the Assessment Boundary and the construction of foundations for structures across all Plots as set out in **Chapter 4** and **Chapter 5** have the potential to impact waterbodies. Works, including dewatering, have the potential to introduce chemical pollution to groundwater encountered during construction or through infiltration of spilt chemicals. The impact will be dependent on the persistence and toxicity of the pollutant and the associated zone of influence. There is also a risk of contaminated land being disturbed and the contaminants mobilised into the groundwater resources.

12.92 However, tertiary mitigation will be in place in the form of sufficient investigation and assessment work, remedial works and a Piling Risk Assessment. These will inform the measures in the CEMP to manage potential contamination risks to groundwater. There is a high level of confidence that the possibility of potential contamination of groundwater will be mitigated, and the impact on the Northern Manchester Carboniferous Aquifer can be considered to be small.

Project for Assessment

12.93 The sensitivity of the aquifer beneath the Assessment Boundary is considered to be medium. Considering the tertiary mitigation in place, the magnitude of change has the potential to be small. Therefore, there is likely to be a direct, permanent, long-term, adverse effect which is considered to be minor.

Proposed Scheme

12.94 The effect on aquifers is the same as that reported for the Project for Assessment as the same aquifer is beneath all Plots of the Project for Assessment.

Secondary Mitigation or Enhancement

12.95 Secondary mitigation will be in place in the form of WFD assessments carried out on a Plot-by-Plot basis to further refine the potential effects and to present detailed mitigation measures where required when works are proposed that will interface with groundwater within the Assessment Boundary. The results of ground investigations and known mitigation measures will be taken into account within these assessments.

12.96 Measures may include material management, management of dewatering activities, foundation design and detailed protection measures for the watercourses.

12.97 For the Proposed Scheme, the WFD assessments will be managed by a planning condition. It is assumed that the same or similar conditions will apply to the Project for Assessment, although this will be a matter for when planning applications are made for those relevant areas.

Table 12.10: Summary of Secondary Mitigation for Construction Stage

Mitigation	Person Responsible	Secured by	Relevant to	
			Project for Assessment	Proposed Scheme
WFD Assessment and implementation of recommended mitigation on a Plot-by-Plot basis at Reserved Matters.	Applicant / future applications	Planning Condition	✓	✓

Residual Effect

12.98 Following secondary mitigation it is expected that the residual effect for Aquifers is that likely to be negligible.

12.99 The sensitivity of the aquifer beneath the Assessment Boundary is considered to be medium. The magnitude of change following mitigation is negligible. Therefore, there is likely to be a direct, permanent, long-term, adverse residual effect which is considered to be negligible.

Significance

12.100 Following the implementation of the Secondary Mitigation, this effect is considered to be **Not Significant** for the Project for Assessment and the Proposed Scheme.

Decrease in water quality due to disturbance of poor quality peat deposits [Project for Assessment and Proposed Scheme]

12.101 Peat is recorded by the BGS interactive viewer across Assessment Plot EE and into Assessment Plot DD, **Figure 13.2** and recorded as pockets or traces as located by **Figure 13.5**. There are some references to 'traces of peat' in the NCB boreholes in the northeast of the Assessment Boundary, (Assessment Plot BB) near Stock Nook Farm. However, this is from an openhole borehole record and as such was determined by chippings only and may be inaccurate. Similarly, in BH207, in Application Plot D, there is reference to a 2.50m thick 'soft clay peat', determined by openholing and which occurs in a low point onsite and as such is anticipated to be organic clay.

12.102 As part of the initial ground investigation, these locations will be reviewed using ground investigation techniques to accurately determine the potential presence / thickness of the peat in these areas. It is unlikely that significant areas of peat will be identified though there is the potential that localised pockets of peat within other strata will be encountered and therefore this impact cannot be discounted at this stage.

12.103 Disturbance of poor quality peat can lead to a decrease in water quality of receiving watercourses through sediment disturbance and runoff. However, tertiary mitigation will be in place in the form of the sufficient investigation and assessment work carried out to date and a CEMP to mitigate potential contamination risks to watercourses (**Volume 3: Environmental Management Plan**). There is a high level of confidence that the possibility of potential contamination of waterbodies will be mitigated, and the impact on the Main Rivers within the Project for Assessment can be considered to be negligible.

Project for Assessment

- 12.104 The sensitivity of the Main Rivers within the Project for Assessment, Whittle Brook and Brightley Brook are considered to be low. The magnitude of change is expected to be negligible. Therefore, there is likely to be a direct, temporary, short-term, adverse effect which is considered to be negligible.
- 12.105 The sensitivity of the Main Rivers downstream of the Project for Assessment, Hollins Brook and River Roch, is considered to be low and medium, respectively. The magnitude of change is expected to be negligible. Therefore, there is likely to be a direct, permanent, long-term, adverse effect but is considered to be negligible.
- 12.106 The sensitivity of Hollins Vale and Pilsworth Fisheries which are downstream of the Project for Assessment but hydraulically linked, is considered to be medium. The magnitude of change is expected to be negligible. Therefore, there is likely to be a direct, permanent, long-term, adverse effect but is considered to be negligible.

Proposed Scheme

- 12.107 The impact on water quality within the Main Rivers, is the same as that reported for the Project for Assessment.

Secondary Mitigation or Enhancement

- 12.108 No secondary mitigation or enhancement is required/has been identified.

Residual Effect

- 12.109 In the absence of secondary mitigation the residual effects for Main Rivers are that same as that reported in the pre-mitigation scenario and are negligible.

Significance

- 12.110 This effect is considered to be **Not Significant** for the Project for Assessment and the Proposed Scheme.

Operational Stage

Flood risk as a result of flooding from failure of On-Site attenuation features installed as part of drainage strategy [Project for Assessment and Proposed Scheme]

- 12.111 The attenuation for the Proposed Scheme takes the form of large basins that will hold flows and discharge at a controlled rate to the watercourses within the Project for Assessment Boundary. Due to the size of the development, these attenuation basins are large in size (however these will be sized at 10,000m³ or less and are therefore not considered to be reservoirs). There is a risk of a breach from these features releasing large volumes. The resultant flooding from this has the potential to have an adverse effect on the existing infrastructure within and adjacent to the Assessment Boundary through overland flows.
- 12.112 Tertiary mitigation is in place as the attenuation basins will be designed to UU S104 SuDS guidance, CIRIA SuDS Manual as well as local LLFA guidance. Therefore, by designing to these standards, the risk of a breach will be low. Further to this, the design of the basins will include a freeboard, meaning that the features will be designed to accommodate flows over the design 1% AEP + 45% climate change design event. Therefore the probability of exceedance and/or failure of the drainage network is reduced. Due to the proposed locations of the basins (within or adjacent to the Landscape Mitigation, any exceedance flows will be directed to lower topographies, towards the watercourses within the Assessment Boundary,

therefore the risk of flooding to Less Vulnerable and More Vulnerable infrastructure receptors within and adjacent to the Application Boundary is low.

- 12.113 Less Vulnerable infrastructure receptors to flood risk include commercial properties within the Assessment Boundary, Heywood Distribution Park, Moto Birch Services Area and the Pike Fold Golf Club. More Vulnerable infrastructure receptors to flood risk include residential properties within the Assessment Boundary and the Hotel (at Moto Birch Services). These are defined on **Figure 12.2**.

Project for Assessment

- 12.114 The sensitivity of the Less Vulnerable and More Vulnerable infrastructure adjacent to the Assessment Boundary is considered to be low to medium, depending on the nature of the infrastructure receptor outlined above. The magnitude of change is considered to be negligible. Therefore, there is likely to be a direct, temporary, short-to long term, adverse effect which is considered to be negligible.

Proposed Scheme

- 12.115 The effects of flood risk for Less Vulnerable and More Vulnerable infrastructure adjacent to and within the Application Boundary is the same as that reported for the Project for Assessment.

Secondary Mitigation or Enhancement

- 12.116 No secondary mitigation or enhancement is required/has been identified.

Residual Effect

- 12.117 In the absence of secondary mitigation the residual effects for Less Vulnerable and More Vulnerable infrastructure are that same as that reported in the pre-mitigation scenario.

Significance

- 12.118 This effect is considered to be **Not Significant** for the Project for Assessment and the Proposed Scheme.

Changes to biological and morphological features within the Main Rivers from structures within the Wetland Habitat Corridors [Project for Assessment and Proposed Scheme]

- 12.119 The structures proposed within the Wetland Habitat Corridors to facilitate crossings of the Main Rivers through the Assessment Boundary and the outfalls for the Drainage Strategy have the potential to impact the waterbodies. These can cause changes to flow dynamics, and therefore morphological features of the watercourse, as well as potential impacts on the chemical and biological status of the watercourse. These potential impacts have been determined for the Project for Assessment within the **WFD Screening Assessment**.
- 12.120 These potential impacts relate to the proposed structures specifically within the Wetland Habitat Corridors where there is interaction with the channel. Throughout the Assessment Boundary these are only likely to occur at select small locations as needed. Therefore there is a risk of potential impacts on the WFD status of Main Rivers within the Assessment Boundary (Whittle Brook and Brightley Brook), downstream Main Rivers (Hollins Brook and River Roch) and downstream waterbodies that are hydraulically linked, (Hollins Vale and Pilsworth Fisheries).
- 12.121 The impacts of outfalls on the flow dynamics and water quality have the potential to cause impacts on the biological and morphological features.

Project for Assessment

- 12.122 The sensitivity of the Main Rivers within the Project for Assessment, Whittle Brook and Brightley Brook, are considered to be low. The magnitude of change has the potential to be medium. Therefore, there is likely to be a direct, permanent, long-term, adverse effect which is considered to be minor.
- 12.123 The sensitivity of the Main Rivers downstream of the Project for Assessment, Hollins Brook and River Roch is considered to be low and medium, respectively. The magnitude of change will be less than within the Assessment Boundary therefore has the potential to be small. Therefore, there is likely to be a direct, permanent, long-term, adverse effect but is considered to be minor.
- 12.124 The sensitivity of Hollins Vale and Pilsworth Fisheries which are downstream of the Project for Assessment but hydraulically linked, is considered to be medium. The magnitude of change will be less than within the Assessment Boundary therefore has the potential to be small. Therefore, there is likely to be a direct, permanent, long-term, adverse effect but is considered to be minor.

Proposed Scheme

- 12.125 The changes to biological and morphological features within the Main Rivers is the same as that reported for the Project for Assessment.

Secondary Mitigation or Enhancement

- 12.126 Secondary mitigation will be in place in the form of WFD assessments carried out on a Plot-by-Plot basis to further refine the potential effects based on detailed information and to present detailed mitigation measures where required when works are proposed within the channel of a Main River within the Assessment Boundary.
- 12.127 Measures may include location advice on any proposed structure and detailed studies to ensure management of effects at the catchment level.
- 12.128 For the Proposed Scheme, the WFD assessments will be managed by planning condition. It is assumed that the same or similar conditions will apply to the Project for Assessment, although this will be a matter for when planning applications are made for those relevant areas.

Table 12.11: Summary of Secondary Mitigation for Operational Stage

Mitigation	Person Responsible	Secured by	Relevant to	
			Project for Assessment	Proposed Scheme
WFD Assessment and implementation of recommended mitigation on a Plot-by-Plot basis at Reserved Matters.	Applicant / future applications	Planning Condition	✓	✓

Residual Effect

- 12.129 Following secondary mitigation it is expected that the residual effect for the Main Rivers is that likely to be negligible.
- 12.130 The sensitivity of the Main Rivers within the Project for Assessment, Whittle Brook and Brightley Brook, are considered to be low. The sensitivity of the Main Rivers downstream of the Project for Assessment, Hollins Brook and River Roch is considered to be low and medium, respectively. The sensitivity of Hollins Vale and Pilsworth Fisheries which are downstream of the Project for Assessment but hydraulically linked, is considered to be medium. The magnitude of change following mitigation is negligible. Therefore, there is likely to be a direct, permanent, long-term, adverse residual effect but is considered to be negligible.

Significance

- 12.131 Following the implementation of the Secondary Mitigation, this effect is considered to be **Not Significant** for the Project for Assessment and the Proposed Scheme.

Changes to quantitative status of the groundwater body from foundations and structures that interface with the groundwater flow [Project for Assessment and Proposed Scheme]

- 12.132 The presence of foundations for structures across all Plots have the potential to impact the flow of groundwater and thereby alter the quantitative status of the groundwater body.
- 12.133 Tertiary mitigation will be in place in the form of sufficient investigation and assessment work. Therefore, there is a high level of confidence that the possibility of potential contamination of groundwater will be mitigated against, and the impact on the Northern Manchester Carboniferous Aquifer can be considered to be small. Further to this, secondary mitigation will be put in place, in the form of detailed WFD assessments, that will detail appropriate mitigation required.

Project for Assessment

- 12.134 The sensitivity of the Aquifers beneath the Assessment Boundary is considered to be medium. The magnitude of change has the potential to be small. Therefore, there is likely to be a direct, permanent, long-term, adverse effect which is considered to be minor.

Proposed Scheme

- 12.135 The effect of changes to quantitative status of the aquifers is the same as that reported for the Project for Assessment as the same aquifer is beneath all Plots of the Project for Assessment.

Secondary Mitigation or Enhancement

- 12.136 Secondary mitigation will be in place in the form of WFD assessments carried out on a Plot-by-Plot basis to further refine the potential effects based on detailed information and to present detailed mitigation measures where required when structures are proposed within the Plot that have the potential for foundations that will interface with groundwater. The results of ground investigations and known mitigation measures will be taken into account within these assessments.
- 12.137 Measures may include location advice on any proposed foundation solution/structure and detailed studies to ensure management of effects at the catchment level.

12.138 For the Proposed Scheme, the WFD assessments will be managed by planning condition. It is assumed that the same or similar conditions will apply to the Project for Assessment, although this will be a matter for when planning applications are made for those relevant areas.

Table 12.12: Summary of Secondary Mitigation for Construction Stage

Mitigation	Person Responsible	Secured by	Relevant to	
			Project for Assessment	Proposed Scheme
WFD Assessment and implementation of recommended mitigation on a Plot-by-Plot basis at Reserved Matters.	Applicant / future applications	Planning Condition	✓	✓

Residual Effect

12.139 Following secondary mitigation it is expected that the residual effect for Aquifers is that likely to be negligible.

12.140 The sensitivity of the Aquifers beneath the Assessment Boundary is considered to be medium. The magnitude of change following mitigation is negligible. Therefore, there is likely to be a direct, permanent, long-term, adverse residual effect which is considered to be negligible.

Significance

12.141 Following the implementation of the secondary mitigation, this effect is considered to be **Not Significant** for the Project for Assessment and the Proposed Scheme.

Decrease in water quality as a result of runoff [Project for Assessment and Proposed Scheme]

12.142 Run off from introduced hard surfaces and roads such as emission pollutants like copper and zinc as well as oil and petrol (hydrocarbons) can cause a decrease in the water quality of receiving watercourses. In addition to emission pollutants, it is expected that plant protection products will be used on a number of the green spaces and hard areas to control unwanted plant growth and pests as part of a routine site management plan. This run-off can enter the watercourse through the discharge of the drainage network or via overland flows.

12.143 Research⁹ has shown that pollution impacts from routine run off on receiving waters appear to be broadly correlated with Annual Average Daily Traffic (AADT) (Highways Agency, 2009). The proposed traffic flows on the internal Assessment Boundary roads are likely to be high (where high is considered to be >10,000 AADT) and therefore pollutants will occur in higher concentrations. Ongoing high concentration run-off of emission pollutants and plant protection products over an extended period can result in major adverse impacts on the ecology and chemical status of the watercourse. It can cause wide ranging effects including: ecotoxicological effects on aquatic flora and fauna, adverse effects on the habitat and food

⁹ The development of a risk-based approach to managing the ecological impact of pollutants in highway runoff, Crabtree, B., et al, 2008, Water Science & Technology, 57.10, pp 1595-1600

sources of terrestrial animals, depletion of dissolved oxygen resulting from decaying organic matter and the increase of BOD from increase in microorganisms from decaying biomass leading to eutrophication¹⁰. It is difficult to predict the volumes of plant protection products entering the watercourse, but these would be expected to be applied on a yearly basis.

- 12.144 Further to emission pollutants and plant protection products, the proposed use of Plots for uses such as data centres may have the potential to result in large amounts of water being used for cooling. Whilst the development and location of these data centres and the volumes of water required are not confirmed at this stage, there is a risk that the discharge of treated coolant water into existing waterbodies can have an adverse effect on the chemical status of the waterbody and subsequent effects on the ecosystem.
- 12.145 There is the potential for a decrease in water quality of watercourses and waterbody receptors within the Assessment Boundary (including Pilsworth Fisheries and Main Rivers) and those downstream receptors that are hydraulically connected (such as Hollins Vale Nature Reserve).
- 12.146 The Drainage Strategy identifies that the Plots will provide a suitable level of water quantity and quality management, the principles of which will be agreed with the contributing statutory undertakers. Additional attenuation and SuDS treatment for water quality is likely to be required within the Plots and this has been considered during the development of the Plans (**Figure 4.2** and **5.2**). These principles will be applied to the Project for Assessment, to mitigate the risk of decreased water quality for all potential receptors within the Assessment Boundary and therefore downstream receptors also.

Project for Assessment

- 12.147 The sensitivity of the ordinary watercourses and waterbody receptors within the Assessment Boundary is considered to be negligible. The sensitivity of the Main Rivers is considered to be low. The sensitivity of downstream Main Rivers within the area of interest (Hollins Brook and River Roch) are considered to be low and medium, respectively and the sensitivity of the downstream hydraulically connected non-statutory sites (Hollins Vale and Pilsworth Fisheries) is considered to be medium.
- 12.148 The magnitude of change is considered to be negligible for potential impacts from emission pollutants and plant protection products due to the implementation of the mitigation outlined above.
- 12.149 Therefore, there is likely to be a direct, temporary, long-term, adverse effect which is considered to be negligible.
- 12.150 However, the magnitude of change associated with the of the discharge of water used in data centres has the potential to be medium. Therefore, there is likely to be a direct, temporary, long-term, adverse effect associated with a data centre which is considered to be moderate.

¹⁰ Herbicides for Use in or Near the Aquatic Environment: Priorities for Environmental Quality Standard Development, Williams, D., et al, 1996, Environment Agency R&D Technical Report P25

Proposed Scheme

12.151 The effects of a decrease in water quality for ordinary watercourses, waterbody receptors, Main Rivers and hydraulically connected non-statutory sites are the same as that reported for the Project for Assessment.

Secondary Mitigation or Enhancement

12.152 Secondary mitigation will be in place in the form of water demand and disposal assessments carried out on a Plot-by-Plot basis as required. Where uses are proposed that have the potential to require large volumes of water that will be discharged into waterbody receptors, these assessments will be required to determine the potential effects and to present appropriate mitigation measures where required.

12.153 For the Proposed Scheme, the water demand and disposal assessments will be managed by planning condition. It is assumed that the same or similar conditions will apply to the Project for Assessment, although this will be a matter for when planning applications are made for those relevant areas.

Table 12.13: Summary of Secondary Mitigation for Operational Stage

Mitigation	Person Responsible	Secured by	Relevant to	
			Project for Assessment	Proposed Scheme
Water Demand and Disposal Assessment for data centre	Applicant / future applications	Planning Condition	✓	✓

Residual Effect

12.154 The sensitivity of the ordinary watercourses and waterbody receptors within the Assessment Boundary is considered to be negligible. The sensitivity of the Main Rivers is considered to be low. The sensitivity of downstream Main Rivers within the area of interest (Hollins Brook and River Roch) are considered to be low and medium, respectively and the sensitivity of the downstream hydraulically connected non-statutory sites (Hollins Vale and Pilsworth Fisheries) is considered to be medium. The magnitude of change following mitigation is considered to be negligible. Therefore, there is likely to be a direct, temporary, long-term, adverse residual effect associated with a data centre which is considered to be negligible.

Significance

12.155 This effect is considered to be **Not Significant** for the Project for Assessment and the Proposed Scheme.

Increase in surface water flood risk as a result of increased overland flows from changes to topography and increased areas of hardstanding [Project for Assessment and Proposed Scheme]

12.156 Currently, the majority of Assessment Boundary is greenfield. Therefore, changes in the topography and areas of new hardstanding have the potential to increase the risk of surface water flooding to Less Vulnerable and More Vulnerable infrastructure receptors within and adjacent to the Assessment Boundary. There is a risk that overland flows will take different pathways with the changes in topography and the increase in the hardstanding will increase the volume of these flows.

12.157 Tertiary mitigation is in place for the Proposed Scheme in the form of the Drainage Strategy. This is designed to accommodate all surface water flows within the Application Boundary and will discharge to watercourses at a greenfield rate. Therefore, there are no additional flows leaving the Application Boundary and the discharge rate remains the same, thereby mimicking the existing regime outlined in the baseline. These principles will be applied to the Project for Assessment, meaning that no additional flows will leave the Assessment Boundary and therefore increase the flood risk to receptors off-site. Less Vulnerable infrastructure receptors to flood risk include commercial properties within the Assessment Boundary, Heywood Distribution Park, Moto Birch Services Area and the Pike Fold Golf Club. More Vulnerable infrastructure receptors to flood risk include residential properties within the Assessment Boundary and the Hotel (at Moto Birch Services). These are defined on **Figure 12.2**.

Project for Assessment

12.158 The sensitivity of Less Vulnerable and More Vulnerable infrastructure is considered to be low to medium, depending on the nature of the infrastructure receptor outlined above. The magnitude of change is considered to be negligible. Therefore, there is likely to be a direct, permanent, long-term, adverse effect which is considered to be negligible.

Proposed Scheme

12.159 The effects of surface water flood risk for Less Vulnerable and More Vulnerable infrastructure receptors are the same as that reported for the Project for Assessment.

Secondary Mitigation or Enhancement

12.160 No secondary mitigation or enhancement is required/has been identified.

Residual Effect

12.161 In the absence of secondary mitigation the residual effects for Less Vulnerable and More Vulnerable infrastructure are the same as that reported in the pre-mitigation scenario.

Significance

12.162 This effect is considered to be **Not Significant** for the Project for Assessment and the Proposed Scheme.

Increased demand on existing drainage networks and Waste Water Treatment Works [Project for Assessment and Proposed Scheme]

12.163 During operation there will be additional loadings to the wastewater network from the increase in occupation of employees and residents within the area. Development of this size will result in large additional loads in the wastewater network. This has the potential to decrease the capacity of the network increasing the risk of flooding from surcharging and leakage and increase the demand on wastewater treatment works thereby decreasing the quality of the discharge from the treatment works.

12.164 Mitigation is in place as outfalls for foul water have been identified during early consultations with United Utilities. Foul water is proposed to drain to either the Bury Wastewater treatment works (indirectly via an identified large diameter combined sewer) or to existing public sewers in Hareshill Road. Primary pumping stations will be required to achieve the connection points that are agreed in principle with United Utilities. Further pumping stations will be required throughout the development to accommodate the phasing strategy and to limit the maximum depth of the foul sewer system to an acceptable design standard for

United Utilities. The foul water system will be designed to adoptable standards to allow maintenance responsibilities to transfer to United Utilities or other approved authority at an appropriate point in the development build out.

- 12.165 This consultation with United Utilities will ensure that appropriate network upgrades are in place to manage the additional loads and therefore mitigate the risks of increased demand on wastewater infrastructure.

Project for Assessment

- 12.166 The sensitivity of the existing drainage network and Wastewater Treatment Works and associated infrastructure is considered to be high. The magnitude of change is considered to be negligible. Therefore, there is likely to be a direct, permanent, long-term, adverse effect which is considered to be negligible.

Proposed Scheme

- 12.167 The effects on increased demand on existing drainage networks and the wastewater treatment works are the same as that reported for the Project for Assessment.

Secondary Mitigation or Enhancement

- 12.168 No secondary mitigation or enhancement is required/has been identified.

Residual Effect

- 12.169 In the absence of secondary mitigation the residual effects for the existing drainage network and wastewater treatment works are the same as that reported in the pre-mitigation scenario.

Significance

- 12.170 This effect is considered to be **Not Significant** for the Project for Assessment and the Proposed Scheme.

Increased demand on water resources and associated infrastructure [Project for Assessment and Proposed Scheme]

- 12.171 During operation there will be additional demand on potable water supplies from the increase in population within the area. This has the potential to deplete water resources such as the aquifers within the area and has the potential to have an adverse impact on the existing potable water infrastructure.
- 12.172 The Project for Assessment includes for potable water infrastructure upgrades proposed along Pilsworth Road and homes will be designed to achieve a water consumption rate of 110l/p/d, exceeding the Building Regulations higher water efficiency rate, thereby reducing the potential for adverse impacts on water resources in the area.
- 12.173 There are commercial and industrial uses proposed within the Proposed Scheme including the potential for data centre usage. These commercial and industrial uses will vary by Plot with some uses (e.g. data centres) potentially requiring much larger volumes of water demand than others (e.g. office space), depending on the technology adopted. Potable water required for non-industrial uses, such as office space and residential units is higher, but there is the potential for industrial uses to use a larger portion of non-potable water than potable water, thereby reducing the impact on the potable supply. Therefore, the impact on water supply and the associated infrastructure will vary by Plot and has the potential to be large depending on the volumes of both potable and non-potable water required.

Project for Assessment

12.174 The sensitivity of the aquifer is considered to be medium, and the sensitivity of the existing potable water infrastructure is considered to be high. The magnitude of change will vary dependant on the proposed use within each Plot and the volumes required of both potable and non-potable water resources, however this has the potential to be considered to be large. Therefore, there is likely to be a direct, permanent, long-term, adverse effect which is considered to be major.

Proposed Scheme

12.175 The effects of increased demand of water resources to the aquifer and existing potable water infrastructure are the same as that reported for the Project for Assessment.

Secondary Mitigation or Enhancement

12.176 Secondary mitigation will be in place in the form of water demand and disposal assessments carried out on a Plot-by-Plot basis as required. Where uses are proposed that have the potential to require large volumes of water, these assessments will be required to determine the potential effects and to present appropriate mitigation measures where required.

12.177 For the Proposed Scheme, the water demand and disposal assessments will be managed by planning condition. It is assumed that the same or similar conditions will apply to the Project for Assessment, but this will be a matter for when planning applications are made for those relevant areas.

Table 12.14: Summary of Secondary Mitigation for Operational Stage

Mitigation	Person Responsible	Secured by	Relevant to	
			Project for Assessment	Proposed Scheme
Water Demand and Disposal Assessment	Applicant / future applications	Planning Condition	✓	✓

Residual Effect

12.178 Following secondary mitigation it is expected that the residual effects for the aquifer and potable water infrastructure are the same as that reported in the pre-mitigation scenario.

12.179 The sensitivity of the aquifer is considered to be medium, and the sensitivity of the existing potable water infrastructure is considered to be high. The magnitude of change following mitigation is considered to be negligible. Therefore, there is likely to be a direct, permanent, long-term, adverse residual effect which is considered to be negligible.

Significance

12.180 This effect is considered to be **Not Significant** for the Project for Assessment and the Proposed Scheme.

Limitations and Assumptions

12.181 To ensure transparency within the EIA process, the following limitations and assumptions have been identified.

- There are assumptions on channel / pipe sizing within the fluvial modelling where surveys cannot be completed due to overgrown vegetation and associated safety concerns. Therefore, the modelled sizing will be based on other pipes within the vicinity and the width the channel shown in the LiDAR. These and any other assumptions and limitations of the modelling are detailed within the modelling report. These are based on best practices and industry standards and the methodology has been agreed with the EA. Therefore the resultant model can be considered acceptable and appropriate to inform this assessment;
- The assessment is based on the information available at the time of writing. A Site Investigation has not been completed prior to submission. The limitations of this are discussed within the Chapter and Drainage Strategy however, reasonable assumptions have been made based on available data that can be considered acceptable to inform this assessment;
- There is a lack of monitoring data for water quality on the watercourses within the Project for Assessment, however, the data supplied by the EA Catchment Explorer and previous studies undertaken and discussed within the **WFD Screening Assessment**, give an indication of the overall quality of the waterbodies in the catchment meaning there is sufficient data to inform the assessment for outline application. Therefore, there are no significant limitations to the other data availability for the assessment or the impact assessment. The assessment is a subjective and qualitative assessment based on experience and presented as value judgements and
- The water environment and flood risk receptors have been defined using a combination of published data sources and project-specific assessments. The availability of published data with which to inform this assessment is considered robust and therefore this approach is considered acceptable.

Summary

12.182 **Table 12.15** provides a summary of the effects, receptors, residual effects and conclusions of significance considered within the Chapter, with reference to both the Project for Assessment and Proposed Scheme.

12.183 The table only provides a summary of the residual effects identified within the assessment. Details of all primary, secondary and tertiary mitigation that has been taken into account is summarised within Volume **3: Environmental Management Plan**.

Table 12.15: Summary of Residual and Significant Effects for the Project for Assessment and Proposed Scheme

Effect	Receptor	Project for Assessment		Proposed Scheme	
		Residual Effect	Is the Effect Significant?	Residual Effect	Is the Effect Significant?
Construction Stage					
Flood risk as a result of flooding from failure of On-Site attenuation features installed as part of drainage strategy	Less Vulnerable and More Vulnerable infrastructure adjacent to and within the Project for Assessment boundary	Negligible adverse	NO	Negligible adverse	NO
Changes to biological and morphological features within the Main Rivers from structures within the Wetland Habitat Corridors	Main Rivers (Whittle Brook, Brightley Brook, Hollins Brook, River Roch) and downstream hydraulically connected sites (Hollins Vale and Pilsworth Fisheries)	Negligible adverse	NO	Negligible adverse	NO
Changes to chemical status of the groundwater body from works that interface with the water table	Northern Manchester Carboniferous Aquifers (Secondary A Aquifer)	Negligible adverse	NO	Negligible adverse	NO
Decrease in water quality due to disturbance of poor quality peat deposits	Main Rivers (Whittle Brook, Brightley Brook, Hollins Brook, River Roch) and downstream hydraulically connected sites (Hollins Vale and Pilsworth Fisheries)	Negligible adverse	NO	Negligible adverse	NO
Operational Stage					
Flood risk as a result of flooding from failure of On-Site attenuation features installed as part of drainage strategy	Less Vulnerable and More Vulnerable infrastructure adjacent to and within the Project for Assessment boundary	Negligible adverse	NO	Negligible adverse	NO

Effect	Receptor	Project for Assessment		Proposed Scheme	
		Residual Effect	Is the Effect Significant?	Residual Effect	Is the Effect Significant?
Changes to biological and morphological features of the waterbody from structures within the Wetland Habitat Corridors	Main Rivers (Whittle Brook, Brightley Brook, Hollins Brook, River Roch) and downstream hydraulically connected sites (Hollins Vale and Pilsworth Fisheries)	Negligible adverse	NO	Negligible adverse	NO
Changes to quantitative status of the groundwater body from foundations and structures that interface with the groundwater flow	Northern Manchester Carboniferous Aquifers (Secondary A Aquifer)	Negligible adverse	NO	Negligible adverse	NO
Decrease in water quality as a result of runoff	Ordinary watercourses and waterbody receptors within the Project for Assessment, Main Rivers and downstream hydraulically connected non-statutory sites	Negligible adverse	NO	Negligible adverse	NO
Increase in surface water flood risk as a result of increased overland flows from changes to topography and increased areas of hardstanding	Less Vulnerable and More Vulnerable infrastructure adjacent to and within the Project for Assessment boundary	Negligible adverse	NO	Negligible adverse	NO
Increased demand on existing drainage networks and Waste Water Treatment Works	Wastewater Treatment Works and associated infrastructure	Negligible adverse	NO	Negligible adverse	NO
Increased demand on water resources and associated infrastructure	Aquifers and existing potable water infrastructure	Negligible adverse	NO	Negligible adverse	NO

References

- ¹ National Planning Policy Framework, Department for Levelling Up, Housing & Communities, 2024.
- ² Planning Practice Guidance: Flood Risk and Coastal Change, Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government, 2022 [Flood risk and coastal change - GOV.UK (www.gov.uk)]
- ³ Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.
- ⁴ The Flood and Water Management Act 2010.
- ⁵ The SUDS Manual, Ciria C753, 2015.
- ⁶ Sustainable drainage systems: non-statutory technical standards, Department for Environment, Food & Rural Affairs, 2015.
- ⁷ Technical guidance To support you in making a Section 104 application, United Utilities.
- ⁸ Rochdale Core Strategy, Adopted October 2016, Rochdale Borough Council, 2017.
- ⁹ In Draft. <https://www.bury.gov.uk/planning-building-control/policy-and-projects/planning-policy/bury-local-plan>.
- ¹⁰ Rochdale Borough's Strategy for Flood Risk Management 2014- 2024, Rochdale Borough Council, 2014.
- ¹¹ Bury Local Flood Risk Management Strategy, Bury Council, 2018.
- ¹² Oldham and Rochdale Urban Design Guide Supplementary Planning Document, Rochdale Borough Council and Oldham Borough Council.