



Trustees of J.P. Milne Will Trust **STAKEHILL INDUSTRIAL ESTATE**

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Environment

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The Milne Trust

STAKEHILL DEVELOPMENT

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12 WATER ENVIRONMENT

ABBREVIATIONS

Term	Description
BGS	British Geological Survey
CEMP	Construction Environmental Management Plan
CIRIA	Construction Industry Research and Information Association
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges
EA	Environment Agency
ES	Environmental Statement
FRA	Flood Risk Assessment
LLFA	Lead Local Flood Authority
NH	National Highways
NPPF	National Planning Policy Framework
PPG	Planning Practice Guidance
QBAR	Equivalent greenfield annual average runoff rate
SAC	Special Area of Conservation
SDS	Sustainable Drainage Statement
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage Systems
WFD	Water Framework Directive

GLOSSARY

Term	Description
Environmental Statement	Document setting out the findings of an Environmental Impact Assessment and produced in accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2011.

Term	Description
Flood Zone 1	Land having less than a 1 in 1000 annual probability of river or sea flooding (<0.1% Annual Exceedance Probability). All land outside of Flood Zone 2 and 3.
Flood Zone 2	Land having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1% AEP); or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% - 0.1% AEP).
Flood Zone 3	Land having a 1 in 100 or greater annual probability of river flooding (>1% AEP); or land having a 1 in 200 or greater annual probability of flooding from the sea (>0.5% AEP).

12.1 INTRODUCTION

- 12.1.1 This Chapter reports the outcome of the assessment of likely significant effects arising from the Proposed Development upon the Water Environment. This Chapter has been produced by BWB Consulting Limited.
- 12.1.2 The assessment of potential effects on the Water Environment has established that the following additional mitigation measures are required:
- A Construction Environmental Management Plan (CEMP).
- 12.1.3 The following residual effects have been identified with regards to the construction phase:
- there is likely to be a direct, temporary, medium-term **negligible** residual effect on construction workers and existing downstream properties ('**not significant**').
 - there is likely to be a direct, temporary, medium-term **negligible** residual effect on local surface water bodies and the wider catchment ('**not significant**').
 - there is likely to be a direct, temporary, medium-term **negligible** residual effect on the underlying aquifers and Water Framework Directive (WFD) groundwater body ('**not significant**').
 - there is likely to be a direct, temporary, medium-term **negligible** residual effect on the local foul water sewer network ('**not significant**').
 - there is likely to be a direct, temporary, medium-term **negligible** residual effect on the local potable water supply ('**not significant**').
- 12.1.4 The following residual effects have been identified with regards to the operational phase:
- there is likely to be a direct, permanent, long-term **negligible** residual effect on Site users and existing downstream properties ('**not significant**').
 - there is likely to be a direct, permanent, long-term **minor beneficial** residual effect on local surface water bodies and the wider catchment ('**not significant**').
 - there is likely to be a direct, permanent, long-term **negligible** residual effect on the underlying aquifers and WFD groundwater body ('**not significant**').
 - there is likely to be a direct, permanent, long-term **negligible** residual effect on the local foul water sewer network ('**not significant**').
 - there is likely to be a direct, permanent, long-term **negligible** residual effect on the local potable water supply ('**not significant**').
- 12.1.5 The following monitoring requirements have been identified:
- Water quality monitoring of surface water flows leaving the site, as specified in the CEMP.
- 12.1.6 The following environmental enhancement opportunities have been identified:
- The proposed watercourse de-culverting and diversion may have amenity and biodiversity benefits. This is also expected to have positive implications on water quality and the WFD status of local surface water bodies.
 - As the Site currently comprises significant areas of arable farmland, there may be a net reduction in diffuse pollution sources from the site from agrichemicals, such as fertiliser and pesticides, which would in turn support an improvement in water quality in the receiving watercourses.
 - The use of sustainable drainage systems (SuDS), such as above ground surface water attenuation, will provide treatment of surface water runoff to an appropriate level. This will ensure runoff from the Site is not having detrimental effects on downstream surface water quality.

- 12.1.7 The remainder of this Chapter describes the assessment methodology and the baseline conditions relevant to the assessment, which have been used to reach these conclusions, as well as a summary of the likely significant effects leading to the additional mitigation measures required to avoid, prevent, reduce or, if possible, offset any likely significant adverse effects, and the likely residual effects and any required monitoring after these measures have been employed. Opportunities for environmental enhancement, where such opportunities exist, are also discussed.
- 12.1.8 This Chapter (and its associated figures and appendices) is intended to be read as part of the wider ES, with particular reference to the Flood Risk Assessment (**Appendix 12.1**) and the Sustainable Drainage Statement (**Appendix 12.2**).

12.2 CONSULTATION, SCOPE, METHODOLOGY AND SIGNIFICANCE CRITERIA

CONSULTATION UNDERTAKEN TO DATE

- 12.2.1 **Table 12-1** provides a summary of the consultation activities undertaken in support of the preparation of this assessment.

Table 12-1 - Summary of consultation undertaken

Body / organisation	Individual / stat body / organisation	Meeting dates and other forms of consultation	Summary of outcome of discussions
Environment Agency (EA)	-	General enquiry via email. 8 th March 2024.	General enquiry submitted which requested any flood risk data for the site. The EA confirmed they do not hold any flood risk data for the Site. No further actions required.
National Highways (NH)	-	Enquiry via email. 30 th August 2024.	General enquiry submitted which requested information on culverts and highway drainage for the strategic road network adjacent to the site. NH provided the requested data. No further actions required.
Rochdale Borough Council	Planning Services	EIA Scoping Opinion. 8 th October 2024.	Rochdale Borough Council requested that the Water Environment was scoped into the ES, due to the potential for environmentally significant effects. An ES Chapter of the Water Environment was prepared in response to this.
United Utilities	-	Pre-development enquiry. 17 th January 2025.	Enquiry for pre-development advice on wastewater drainage submitted and an initial response was received.

Body / organisation	Individual / stat body / organisation	Meeting dates and other forms of consultation	Summary of outcome of discussions
			Continued consultation with United Utilities will be undertaken.
Rochdale Borough Council	Lead Local Flood Authority (LLFA)	Enquiry via email. 20 th January 2025.	A specific enquiry relating to the calculation of the equivalent greenfield annual average runoff rate was submitted. The proposed parameters for the calculation were found to be acceptable by the LLFA.

SCOPE OF THE ASSESSMENT

- 12.2.2 The scope of this assessment has been established through an ongoing scoping process. Further information can be found in **Chapter 5: Approach to EIA**.
- 12.2.3 Within the Scoping Opinion, Rochdale Borough Council requested that the Water Environment was scoped into the Environmental Statement (ES), due to the potential for environmentally significant effects. In particular, the need for consideration of the treatment of water bodies on-Site and the potential effects of the Proposed Development on these was raised.

ELEMENTS SCOPED OUT OF THE ASSESSMENT

- 12.2.4 No elements have been agreed to be scoped out of the assessment, to fully assess potential effects on the Water Environment, in line with the Scoping Opinion.

ELEMENTS SCOPED INTO THE ASSESSMENT

Construction Phase

- 12.2.5 The following elements are considered to have the potential to give rise to likely significant effects during construction of the Proposed Development and have therefore been considered within this assessment:
- Change in Flood Risk On and Off Site;
 - Change in the Quantity and Quality of Surface Water Runoff;
 - Change in the Quality of Runoff Infiltrating to Groundwater Sources;
 - Increase in Pressure on Local Foul Water Sewer Network; and
 - Increase in Pressure on Local Potable Water Supply.

Operation Phase

- 12.2.6 The following elements are considered to have the potential to give rise to likely significant effects during operation of the Proposed Development and have therefore been considered within this assessment:
- Change in Flood Risk On and Off Site;
 - Change in the Quantity and Quality of Surface Water Runoff;
 - Change in the Quality of Runoff Infiltrating to Groundwater Sources;
 - Increase in Pressure on Local Foul Water Sewer Network; and

- Increase in Pressure on Local Potable Water Supply.

EXTENT OF THE STUDY AREA

- 12.2.7 The study area for this Chapter comprises the Site. However, it is noted that other significant receptors may exist beyond the study area, as well as cumulative effects, and these are also included within this Chapter.
- 12.2.8 The Environment Agency (EA) assesses surface water at a river catchment level. Therefore, when considering a potential for effects on downstream water quality, the potential for effects at a river catchment level have been considered in this Chapter.

METHOD OF BASELINE DATA COLLATION

DESK STUDY

- 12.2.9 This ES Chapter is based on the following assessments:
- Flood Risk Assessment (FRA) prepared by BWB Consulting Limited in January 2025 (**Appendix 12.1**) (reference: 233493-BWB-ZZ-XX-T-W-0007_FRA); and
 - Sustainable Drainage Statement (SDS), including a surface water and foul water strategy, prepared by BWB Consulting Limited in January 2025 (**Appendix 12.2**) (reference: 233493-BWB-ZZ-XX-T-W-0005_SDS).
- 12.2.10 The desktop study of baseline conditions is based on EA datasets, local flood risk guidance, United Utilities sewer records and British Geological Survey (BGS) mapping. The following reports were also reviewed to inform the baseline conditions:
- Phase 1 Geo-Environmental Desk Study Report prepared by Robert E Fry & Associates Ltd in April 2018 (reference: 18061/GEDS); and
 - Utility Statement prepared by Utilities Connections Management Limited in June 2018 (reference: M239).

SITE VISIT AND SURVEYS

- 12.2.11 A site visit was undertaken by BWB Consulting Limited in March 2024 to observe the local hydrological features and to identify possible appropriate outfalls for the Site.
- 12.2.12 An investigation of the surface water and foul water drainage systems was undertaken by Terrain Surveys in July 2024 (reference: TS24-386). The survey confirmed the presence of surface water sewers in Bentley Avenue and Stakehill Lane and of combined sewers within the Site and Stakehill Lane. A catchpit was identified within the west of the Site, along the alignment of the culverted watercourse; however, the full alignment of the culverted watercourse was unable to be determined as further tracing was not possible.

ASSESSMENT METHODOLOGY

- 12.2.13 This assessment outlines the potential direct and indirect effects of the Proposed Development on the Water Environment, specifically on the effects scoped in as above, during the construction and operational phases.

SIGNIFICANCE CRITERIA

- 12.2.14 The significance level attributed to each effect has been assessed based on the sensitivity/value of the affected receptor(s) and the magnitude of change arising from the Proposed Development, as

well as a number of other factors that are outlined in more detail in **Chapter 5: Approach to EIA**. The sensitivity of the affected receptor is assessed on a scale of high, medium and low, and the magnitude of change is assessed on a scale of major, moderate, minor and negligible, as set out in **Chapter 5: Approach to EIA**.

- 12.2.15 The significance of each direct and indirect effect will be measured in accordance with **Table 12-2**, which takes into account the quality and rarity of a resources as well as its sensitivity to change. The thresholds have been derived with reference to the best practice and professional judgment.

Table 12-2 - Receptor value / sensitivity assessment

Criteria	Sensitivity	Commentary
Flood risk receptors	Low	Land use types defined as 'Water Compatible' in the NPPF flood risk vulnerability classification.
	Medium	Land use types defined as 'Less Vulnerable' and 'More Vulnerable' in the NPPF flood risk vulnerability classification.
	High	Land use types defined as 'Highly Vulnerable' and 'Essential Infrastructure' in the NPPF flood risk vulnerability classification.
Surface Waterbodies	Low	Waterbody having a WFD classification of 'Poor' to 'Bad'.
	Medium	Waterbody having a WFD classification of 'Moderate'.
	High	Waterbody having a WFD classification of 'Good' or 'High'.
Surface and foul water sewers	Low	Private water drainage infrastructure in rural areas or within a commercial facility.
	Medium	Private water drainage infrastructure in urbanised or industrial areas and public water drainage infrastructure in urbanised and rural areas.
	High	Drainage infrastructure within or draining towards a critical drainage area.
Water Supply	Low	Private water supply infrastructure in rural areas or within a commercial facility.
	Medium	Private water supply infrastructure in urbanised or industrial areas and

Criteria	Sensitivity	Commentary
		public water supply infrastructure in an area of 'not serious' water stress.
	High	Public water supply infrastructure in an area of 'serious' water stress.

12.2.16 The magnitude of each direct or indirect effect will be measured according to the likely effects as detailed in **Table 12-3**. The importance of each receptor should be considered as well as the scale, duration, reversibility and frequency of impact.

Table 12-3 – Criteria for magnitude of impact

Magnitude	Description	
	Adverse	Beneficial
Negligible	No appreciable change in flood risk. No measurable effects on WFD quality elements. No change to demand for surface and/or foul water infrastructure or capacity. No change to demand for the capacity of water supply and the existing water supply infrastructure.	
Minor	Minor local-scale increases in flood risk. Localised adverse effects on WFD quality elements, although not sufficient to change WFD status of water body. Increase in surface and / or foul water discharge which would require modifications to existing infrastructure. Increase in water supply demand which would place additional pressure on existing local supplies and existing water supply infrastructure.	Minor local-scale reductions in flood risk. Localised beneficial effects on WFD quality elements, although not sufficient to change WFD status of water body. Temporary local scale reduction in demand for surface and / or foul water infrastructure. Temporary local scale reduction in demand for water supply.
Moderate	Moderate local-scale or minor regional-scale increases in flood risk. Contribution to a reduction in water body WFD classification. Increase in surface and / or foul water discharge which would place undue pressure on existing infrastructure. Increase in water supply demand which would place undue pressure on existing local supplies and existing water supply infrastructure.	Moderate local-scale or minor regional-scale reductions in flood risk. Contribution to an improvement in water body WFD classification. Minor permanent reduction in demand for surface and / or foul water infrastructure. Permanent local scale reduction in water demand.
Major	Substantial local-scale or moderate to substantial regional-scale increases in flood risk.	Substantial local-scale or moderate to substantial regional-scale reductions in flood risk.

Magnitude	Description	
	Adverse	Beneficial
	Reduction in water body WFD classification. Increase in surface and / or foul water discharge which would require new infrastructure. Increase in water supply demand which would exceed the water resource capacity of the region and therefore require new sources e.g. application of an abstraction licence.	Improvement in water body WFD classification. Major permanent reduction in demand for surface and / or foul water infrastructure. Permanent regional scale reduction in water supply demand.

EFFECT SIGNIFICANCE

12.2.17 The following terms have been used to define the significance of the effects identified and apply to both beneficial and adverse effects:

- **Major effect:** where the Proposed Development could be expected to have a substantial improvement or deterioration on receptors;
- **Moderate effect:** where the Proposed Development could be expected to have a noticeable improvement or deterioration on receptors;
- **Minor effect:** where the Proposed Development could be expected to result in a perceptible improvement or deterioration on receptors; and
- **Negligible:** where no discernible improvement or deterioration is expected as a result of the Proposed Development on receptors, including instances where no change is confirmed.

12.2.18 The predicted significance of effect is based on the consideration of the magnitude of impact and the sensitivity of the resource/receptor to come to a professional judgement as to how significant this effect is, using **Table 12-4** as a guide.

Table 12-4 – Magnitude / significance of effect

Receptor Sensitivity	Magnitude of Impact			
	Major	Moderate	Minor	Negligible
High	Major	Moderate	Minor	Negligible
Medium	Moderate	Moderate	Minor/ Negligible	Negligible
Low	Moderate	Minor	Negligible	Negligible

12.2.19 As set out in **Chapter 5: Approach to EIA**, effects that are classified as **moderate or above** are considered to be **significant**. Effects classified as below **moderate** are considered to be **not significant**.

12.3 LEGISLATIVE FRAMEWORK, POLICY AND GUIDANCE

LEGISLATIVE FRAMEWORK

12.3.1 The applicable legislative framework is summarised as follows:

- Flood and Water Management Act 2010 (**Ref. 12.1**);
- Water Act 2014 (**Ref. 12.2**);
- Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (**Ref. 12.3**); and
- Water Industry Act 1991 (**Ref. 12.4**).

POLICY

12.3.2 The following local policy documents are of relevance to this ES Chapter:

- Rochdale Borough Council (2016) Rochdale Adopted Core Strategy (**Ref. 12.5**);
- Greater Manchester Combined Authority (2024) Places for Everyone Plan 2022 to 2039 (**Ref. 12.6**); and
- Rochdale Metropolitan Borough Council (2012) Climate Change Adaptation Supplementary Planning Document (**Ref. 12.7**).

12.3.3 In addition, this Chapter has been prepared in accordance with the Government's National Planning Policy Framework (NPPF) (**Ref. 12.8**), last revised in 2024, and the Planning Practice Guidance (PPG) (**Ref. 12.9**).

GUIDANCE

12.3.4 The following guidance documents have been used during the preparation of this ES Chapter:

- Design Manual for Roads and Bridges (DMRB) LA113 Road drainage and the water environment guidance (**Ref. 12.10**);
- EA 'Flood Risk Assessments: Climate Change Allowances' (**Ref. 12.11**);
- EA North West River Basin District River Basin Management Plan (**Ref. 12.12**);
- Level 1 Strategic Flood Risk Assessment for Greater Manchester – Update (**Ref. 12.13**);
- Greater Manchester Level 2 Hybrid Strategic Flood Risk Assessment (**Ref. 12.14**);
- Greater Manchester Strategic Flood Risk Management Framework (**Ref. 12.15**);
- Rochdale Metropolitan Borough Council Preliminary Flood Risk Assessment (PFRA) (**Ref. 12.16**) and addendum (**Ref. 12.17**);
- Rochdale Borough's Strategy for Flood Risk Management 2014 - 2024 (**Ref. 12.18**);
- CIRIA C532 Control of Water Pollution from Construction Sites (**Ref. 12.19**);
- CIRIA C624 Development and Flood Risk (**Ref. 12.20**);
- CIRIA C753 SuDS Manual (**Ref. 12.21**);
- EA's 'Pollution Prevention Guidance' (**Ref. 12.22**); and
- Department for Environment, Food and Rural Affairs (Defra) Non-Statutory Technical Standards for Sustainable Drainage Systems (**Ref. 12.23**).

12.3.5 Whilst the EA's Pollution Prevention Guidance (**Ref. 12.22**) was revoked in 2015, this guidance provides advice on best practice to minimise the risk of pollution from activities including construction.

12.4 BASELINE CONDITIONS

- 12.4.1 The baseline conditions at the Site are outlined in the associated FRA and SDS (**Appendix 12.1** and **Appendix 12.2**). A summary is provided below.

HYDROLOGY

- 12.4.2 The Whit Brook, an EA Main River, is located to the west of the Site and flows east to west through the study area. Upstream of the A627(M) Motorway and within the Site itself, the Whit Brook is an ordinary watercourse. It is assumed that this is culverted under the south-eastern extents of the Site, discharging to the west of Stakehill Lane.
- 12.4.3 A tributary of the Whit Brook, also an EA Main River, is located to the south-west of the north-western extents of the Site, south of the A6644/A627(M) roundabout. This tributary flows north to south away from the Site.
- 12.4.4 There is a series of fishery ponds within the centre of the Site, which are fed by an ordinary watercourse. This watercourse issues to the east of the Site and is culverted under the A627(M) Motorway. These ponds are understood to be managed by an angling club and not used by United Utilities.
- 12.4.5 Another minor watercourse is understood to be located within the Site, to the south of the ponds. This issues to the east of the Site and is culverted under the A627(M) Motorway. The ordinary watercourse issues from culvert in the east of the site, to re-enter a culvert within the Site.
- 12.4.6 A culverted watercourse is also mapped within the west of the site, where the system is understood to originate. The watercourse flows south through the site, towards Stakehill Industrial Estate.
- 12.4.7 The Rochdale Canal is located approximately 140m west of the site. This is noted to be a Special Area of Conservation (SAC) and a Site of Special Scientific Interest (SSSI).
- 12.4.8 Other minor surface waterbodies are located within the vicinity of the Site. This includes a surface waterbody within Stakehill Industrial Estate, to the south-west, known as Stakehill Pond.
- 12.4.9 BGS mapping depicts the Site is predominantly underlain by bedrock of the Pennine Lower Coal Measures Formation (Mudstone, Siltstone and Sandstone). Bands of Royley Sandstone (Sandstone) is mapped through the north-east of the site. These bedrock geologies are designated by the EA as Secondary A Aquifers, suggesting permeable layers underlying the Site.
- 12.4.10 Superficial deposits of Till (Devensian – Diamicton) are mapped across the majority of the site. Glaciofluvial deposits (Devensian – Sand and Gravel) are indicated on BGS mapping in the west, north and south-east of the site. These superficial deposits are also designated by the EA as Secondary A Aquifers.

Flood Risk

- 12.4.11 The Site is located entirely within Flood Zone 1, which is defined as land at low probability of flooding from rivers and sea. The nearest EA Flood Zone extents are located approximately 760m west of the Site, associated within the Trub Brook. The nearest EA Flood Zone extents associated with the Whit Brook are located approximately 780m south-west. The Site is not located within an area considered to be at risk of flooding from tidal sources.

- 12.4.12 EA Risk of Flooding from Surface Water mapping shows the majority of the Site is at very low risk of flooding from pluvial sources. There are areas of low (1 in 1000-year) to high (1 in 30-year) risk associated with potential overland flow routes and topographical low points.
- 12.4.13 The Site is depicted on EA mapping to be located outside of the maximum extent at risk of flooding in the event of a reservoir failure.
- 12.4.14 The Site is topographically above the Rochdale Canal; as such, this is not considered to pose a flood risk to the Site.

Surface Water

- 12.4.15 The site is not anticipated to be served by a positive surface water drainage system, given its greenfield condition. This is with the exception of the culverted watercourse mapped within the west of the site.
- 12.4.16 Public sewerage infrastructure is located within Stakehill Lane and Bentley Avenue, as detailed in the SDS (**Appendix 12.2**). This includes two 300mm diameter combined sewers which flow in a southerly and north-westerly direction along Stakehill Lane. These combined sewers converge within the west of the site, to form a 225mm diameter combined sewer which passes through the Site in a south-westerly direction.
- 12.4.17 The existing drainage regime is anticipated to consist of limited infiltration followed by rapid surface water runoff which will follow existing topography and flow towards the watercourses within the Site or surrounding surface water sewers.

Water Quality

- 12.4.18 The Site is located within the Irk (Source to Wince Brook) water body. Under the Water Framework Directive (WFD), this is designated as a heavily modified water body and has a WFD overall water body quality classification of 'moderate', with an ecological status of 'moderate' and a 'fail' chemical status. The catchment has an objective of achieving 'moderate' overall and ecological statuses by 2027. It is noted that there is low confidence in achieving this objective, due to disproportionate expense and technical infeasibility.
- 12.4.19 With regards to groundwater, the Site is located within the Northern Manchester Carboniferous Aquifers water body. This groundwater body is classified to have a 'poor' overall waterbody status under the WFD. The protected areas associated with this groundwater body include the Northern Manchester Carboniferous Aquifers Drinking Water Protected Area.
- 12.4.20 The Site is not located within a groundwater Source Protection Zone (SPZ).

Foul Water

- 12.4.21 The Site is located within United Utilities' sewerage area. Properties in the vicinity of the Site are expected to be served by the network of combined sewers within Stakehill Lane and Bentley Avenue, as described above. Alternatively, foul water may also be disposed of through on-site management or disposal systems.

Local Clean Water Supply

- 12.4.22 Clean water is supplied to the area by United Utilities. The EA classifies the United Utilities region as being 'not seriously water stressed', although it is noted that a degree of pressure on water resources may still be present.

FUTURE BASELINE

- 12.4.23 Climate change may lead to increased rainfall intensity and peak flows within watercourses, and also increased pressure on water resources. The FRA and the SDS (**Appendix 12.1** and **Appendix 12.2**), including the surface water drainage strategy, will consider future climate change.
- 12.4.24 Surface water and groundwater quality within the Site is expected to remain as current condition due to no changes in activity in the future baseline scenario. The EA Catchment Data Explorer does not identify any planned measures to improve the classification of the local surface water or groundwater bodies.
- 12.4.25 The area in which United Utilities operate is considered by the EA to be 'not seriously water stressed'. This classification reportedly considers future climate change scenarios.

12.5 SENSITIVE RECEPTORS

- 12.5.1 The following sensitive receptors have been assessed, as summarised in **Table 12-5**:

Table 12-5 – Sensitive Receptors

Environmental Effect	Receptor	Sensitivity
Change in flood risk on and off site	Construction workers and future site users	High
	Existing downstream residential properties	High
	Existing downstream commercial properties	Medium
Change in the quantity and quality of surface water runoff	Local surface water bodies Irk (Source to Wince Brook) WFD surface water body	Medium
Change in the quality of runoff infiltrating to groundwater	Underlying aquifers Northern Manchester Carboniferous Aquifers WFD groundwater body	Medium
Increase in pressure on the local foul water sewer network	Local public foul water network	Medium
Increase in pressure on the local potable water supply	Local public potable water supply	Medium

12.6 ASSESSMENT OF POTENTIAL EFFECTS, MITIGATION AND RESIDUAL EFFECTS

CONSTRUCTION PHASE

Change in Flood Risk On and Off Site

- 12.6.1 There is potential for fluvial floodplain and overland flow routes within the Site to be disrupted, through the inappropriate location of the site compound or material stores. This could redirect flood water onto third party land, and result in increased flood risk to sensitive receptors downstream. The potential effect of flood risk on and off Site is considered to be **major adverse** due to a major adverse magnitude effect on a high sensitivity receptor prior to mitigation.
- 12.6.2 Tertiary mitigation, in the form of the Construction Environmental Management Plan (CEMP), will include measures that will direct the location of welfare facilities and the storage of material to outside of both the pluvial and fluvial floodplains, to prevent any adverse displacement of the floodplain and prevent Site users from being put at risk.
- 12.6.3 Recommendations within the CEMP will include for construction workers, Site managers and Site visitors to sign up for Met Office weather warnings, to monitor local weather warnings and forecasts and to avoid existing topographical depressions or pluvial flow routes within the Site during times of heavy rainfall. Best practice and health and safety measures should be adhered to when working within or near surface water bodies, including the fishery ponds and ordinary watercourses within the Site. These recommendations will further manage the risk to Site users during construction.
- 12.6.4 Any change in flood risk on or off Site during the construction phase is considered to be direct, of medium term and temporary in nature.
- 12.6.5 Overall, following mitigation, the magnitude of the impact is considered to be negligible. Considering the high sensitivity of the potential receptors, the residual effect of changes in flood risk on and off Site is deemed to be **negligible** (not significant).

Table 12-6 – Assessment of potential effects, additional mitigation, residual effects and monitoring during construction: Change in Flood Risk On and Off Site

Sensitive receptor	Construction workers and existing downstream properties.
Potential effects	The sensitivity of the above receptors are medium to high and the magnitude of change is major adverse. Therefore, there is likely to be a direct, temporary, medium-term major adverse effect on construction workers and existing downstream properties ('significant').
Additional mitigation	A CEMP will be prepared which will prevent any adverse displacement of the floodplain and prevent Site users from being put at risk. This will be secured through a planning condition, to implemented by a competent contractor during construction.
Residual effects and monitoring	The sensitivity of construction workers and existing downstream properties is high and the magnitude of change, following mitigation, is negligible. Therefore, there is likely to be a direct, temporary, medium-term negligible residual effect ('not significant') on construction workers and existing downstream properties following the implementation of mitigation measures.

Change in the Quantity and Quality of Surface Water Runoff

Surface Water Quantity

- 12.6.6 The operation of construction plant, heavy machinery and vehicles on the Site could result in soil compaction. This could lead to reduced infiltration rates, which could in turn result in an increase in surface water runoff rates. An increase in runoff may increase downstream flood risk, as considered above. The potential effect on surface water quantity is considered to be **moderate adverse** based on a medium sensitivity receptor and a moderate magnitude of the effect, prior to mitigation.
- 12.6.7 However, as part of tertiary mitigation associated with the Proposed Development, a CEMP will ensure that appropriate surface water management measures are in place at the construction stage. Measures may include:
- designated pathways for large vehicles to limit areas of sediment compaction; and
 - implementing temporary surface water conveyance routes and temporary attenuated storage measures which will ensure surface water runoff is intercepted, safely stored and discharged from the Site at a rate no greater than existing.
- 12.6.8 Any change in the quantity (namely the rate and volume) of surface water runoff during the construction phase is considered to be direct, of short to medium term and temporary in nature.
- 12.6.9 Following mitigation, the magnitude of the impact is therefore considered to be negligible. The receptors, namely local surface water bodies and the wider surface water catchment, are considered to be of medium sensitivity. The residual effect is therefore predicted to be **negligible**, which is not significant.

Surface Water Quality

- 12.6.10 The construction works will introduce excavations, exposed ground, stockpiles, dust and mud to the Site, which could lead to an increase in suspended sediments and contribute to water pollution. In the event of heavy rainfall during construction works, suspended sediments may be mobilised and impact on the quality of surface water runoff leaving the Site. This in turn could lead to the disruption of habitats, blockage of restrictive structures and alteration to flow regimes, in addition to a decline in water quality, in surface water bodies downstream of the Site.
- 12.6.11 The construction works will also introduce vehicles to the Site that may require wash-down, particularly in the case of concrete production. As a result, particulate pollution may enter local surface water bodies.
- 12.6.12 The use of construction plant and vehicles could also result in hazardous substances, such as oils or fuels, entering the receiving surface waters by spillages or leakages whilst operating. In addition, construction activities may introduce polluting substances including, but not limited to, solvents, cleaning agents and paints to the Site. Incorrect storage or use of polluting substances on the Site may lead to the pollution of downstream surface water bodies.
- 12.6.13 Prior to mitigation, the potential effects on surface water quality on local surface water bodies is considered to be **moderate adverse** due to a moderate magnitude effect on a medium sensitivity receptor.
- 12.6.14 However, as part of the proposed mitigation measures, construction phase surface water management measures will be included within a CEMP. These will manage the quality of surface

water runoff and prevent significant adverse effects on downstream surface water quality. Measures may include:

- providing appropriate measures to provide treatment to runoff prior to discharge from the Site through the surface water management plan;
- monitoring the water quality of surface water flows leaving the Site;
- providing welfare facilities including the proper disposal of foul water;
- covering the surfaces of stockpiles or large areas of bare ground, or treating such as through hydroseeding, to reduce sediment mobilisation;
- undertaking wheel washing facilities and regular sweeping, to reduce sediment build-up;
- dust management;
- appropriate management of waste water from wheel and lorry washing facilities and concrete production, if mixed on Site;
- regular inspection and maintenance of vehicles used on Site;
- a designated bunded impermeable area for on-site refuelling; and
- locating oil and fuel storage in appropriate above ground storage tanks, with facilities to include drip trays for use under vehicles to prevent contaminated runoff.

12.6.15 On the basis of the above, the magnitude of the impact is, therefore, considered to be negligible. The local surface water bodies and wider catchment are considered to be of medium sensitivity to surface water quality, due to a WFD classification of 'moderate'. As such, the significance of the residual effect on surface water quality on local surface water bodies and the wider surface water catchment are considered to be **negligible** (not significant).

Table 12-7 – Assessment of potential effects, additional mitigation, residual effects and monitoring during construction: Change in the Quantity and Quality of Surface Water Runoff

Sensitive receptor	Local surface water bodies and the wider surface water catchment.
Potential effects	The sensitivity of the above receptors is medium and the magnitude of change is moderate adverse. Therefore, there is likely to be a direct, temporary, medium-term moderate adverse effect on local surface water bodies and the wider catchment (' significant ').
Additional mitigation	A CEMP will be prepared which will include appropriate construction phase surface water management measures. This will be secured through a planning condition, to implemented by a competent contractor during construction.
Residual effects and monitoring	The sensitivity of local surface water bodies and the wider catchment is medium and the magnitude of change, following mitigation, is negligible. Therefore, there is likely to be a direct, temporary, medium-term negligible residual effect ('not significant') on these sensitive receptors following the implementation of mitigation measures. Within the CEMP, measures may include monitoring water quality of surface water flows leaving the Site, to ensure any mitigation measures are operating as intended.

Change in the Quality of Runoff Infiltrating to Groundwater

12.6.16 The above impacts on surface water quality may also lead to reduced quality of the local groundwater receptors. The Site is underlain by Secondary A Aquifers, whilst the wider groundwater management catchment has a poor overall WFD status; as such, the underlying groundwater

receptor is considered to be of medium sensitivity. Therefore, prior to mitigation, the effect is considered to be **moderate adverse** based on a moderate magnitude effect on a medium sensitivity receptor.

- 12.6.17 The implementation of an appropriate CEMP, as part of the proposed tertiary mitigation measures, will ensure any potential effects are of a negligible magnitude, through measures to manage the quality of surface water runoff. The residual effect on groundwater quality is therefore considered to be **negligible**, which is not significant.

Table 12-8 – Assessment of potential effects, additional mitigation, residual effects and monitoring during construction: Change in the Quality of Runoff Infiltrating to Groundwater

Sensitive receptor	Underlying aquifers and the underlying WFD groundwater body.
Potential effects	The sensitivity of the above receptors is medium and the magnitude of change is moderate adverse. Therefore, there is likely to be a direct, temporary, medium-term moderate adverse effect on the underlying aquifers and WFD groundwater body (' significant ').
Additional mitigation	A CEMP will be prepared which will include appropriate measures to manage surface water runoff quality. This will be secured through a planning condition, to implemented by a competent contractor during construction.
Residual effects and monitoring	The sensitivity of the underlying aquifers and WFD groundwater body is medium and the magnitude of change, following mitigation, is negligible. Therefore, there is likely to be a direct, temporary, medium-term negligible residual effect ('not significant') on these sensitive receptors following the implementation of mitigation measures. Within the CEMP, measures may include monitoring water quality of surface water flows leaving the Site, to ensure any mitigation measures are operating as intended.

Increase in Pressure on Local Foul Water Sewer Network

- 12.6.18 There is expected to be an increase to the foul water generated on Site due to the temporary presence of construction workers and associated welfare facilities. However, it is anticipated that welfare facilities will be self-contained with built-in drainage tanks; as such, there will be no interaction with the local foul sewer network and, therefore, no change to the baseline conditions. The significance of this effect is therefore **negligible** as a result of a negligible magnitude effect on a medium sensitivity receptor, prior to mitigation.
- 12.6.19 Furthermore, mitigation within a CEMP will include appropriate measures to dispose of the foul water generated.
- 12.6.20 As no significant adverse effects have been predicted, no additional mitigation is considered to be required and the residual effect is predicted to remain **negligible**, which is not significant.

Table 12-9 – Assessment of potential effects, additional mitigation, residual effects and monitoring during construction: Increase in Pressure on Local Foul Water Sewer Network

Sensitive receptor	Local foul water sewer network.
Potential effects	The sensitivity of the above receptor is medium and the magnitude of change is negligible. Therefore, there is likely to be a direct, temporary, medium-term negligible effect on the local foul water sewer network (' not significant ').
Additional mitigation	A CEMP will be prepared which will include appropriate measures to dispose of foul water generated during the construction phase. This will be secured through a planning condition, to implemented by a competent contractor during construction.
Residual effects and monitoring	The sensitivity of the local foul water sewer network is medium and the magnitude of change, following mitigation, is negligible. Therefore, there is likely to be a direct, temporary, medium-term negligible residual effect (' not significant ') on these sensitive receptors following the implementation of mitigation measures.

Increase in Pressure on Local Potable Water Supply

- 12.6.21 As a result of construction activities and the presence of constructions workers, there may be an increased demand on the local water supply. Consultation should be undertaken with the local water supplier to understand the requirements for sufficient water supply during the construction phase including any necessary mitigation measures. If required, mitigation measures may include upgrades by the water supplier to supply pipe sizes or pressures. The developer will work with the water supplier to ensure that any reinforcement measures are in place prior to the construction phase as required, thus avoiding potential adverse impacts. This minor magnitude effect on a medium sensitivity receptor is therefore considered to have a **negligible** (not significant) effect.
- 12.6.22 As no significant adverse effects have been predicted, no additional mitigation is considered to be required and the residual effect is predicted to remain **negligible**, which is not significant.

Table 12-10 – Assessment of potential effects, additional mitigation, residual effects and monitoring during construction: Increase in Pressure on Local Potable Water Supply

Sensitive receptor	Local potable water supply.
Potential effects	The sensitivity of the above receptor is medium and the magnitude of change is minor. Therefore, there is likely to be a direct, temporary, medium-term negligible effect on the local potable water supply (' not significant ').
Additional mitigation	Subject to consultation with the water supplier and any reinforcement measures that may be undertaken by the water supplier, no additional mitigation is considered to be required.
Residual effects and monitoring	The sensitivity of the local potable water supply is medium and the magnitude of change, following mitigation, is negligible. Therefore, there is likely to be a direct, temporary, medium-term negligible residual effect (' not significant ') on these sensitive receptors following the implementation of mitigation measures.

OPERATIONAL PHASE

Change in Flood Risk On and Off Site

- 12.6.23 The Proposed Development has the potential to cause disruption or displacement of the fluvial floodplain associated with the ordinary watercourses within the Site, which could affect downstream receptors. The Proposed Development also has the potential to impede or displace surface water flow routes through the Site. However, as part of the primary mitigation embedded within its design, the Proposed Development will be sequentially arranged such that all built development is located outside of appropriate easements associated with the ordinary watercourses within the Site, when flowing both within culvert and within open channel.
- 12.6.24 It is proposed that the ordinary watercourse immediately south of the fishery ponds is diverted. This diversion should be appropriately designed to ensure sufficient capacity is available and to avoid cross-catchment transfer of flows. This will ensure that there are no adverse effects on flood risk within and downstream of the Site.
- 12.6.25 Where possible, the development has been designed for pluvial flow routes to be maintained, for example in public open space. Where this is not feasible, ground levels will be profiled to direct runoff into the positive drainage system and away from the proposed built development.
- 12.6.26 The FRA (**Appendix 12.1**) identified residual flood risks within the Site and provided relevant mitigation recommendations. As part of primary design mitigation within the Proposed Development, finished floor levels should be raised above immediate surrounding ground levels to offer mitigation from any residual flood risk, such as exceedance or blockage of the nearby sewer network or risk of localised pluvial flooding. The raising of finished floor levels and profiling of external ground levels, as part of the inherent design mitigation measures, will mitigate residual flood risks to the Proposed Development.
- 12.6.27 The delivery of an appropriate drainage strategy in accordance with the principles set out in the SDS (**Appendix 12.2**), as part of the primary design mitigation, will ensure that the Proposed Development does not increase flood risk elsewhere. The proposed surface water drainage strategy will be designed to intercept and attenuate the additional surface water generated by the Proposed Development.
- 12.6.28 Therefore, taking into consideration the above primary mitigation measures, the effect of the Proposed Development on flood risk on and off Site is considered to be **negligible**, which is not significant.

Table 12-11 – Assessment of potential effects, additional mitigation, residual effects and monitoring during operation: Change in Flood Risk On and Off Site

Sensitive receptor	Site users and existing downstream properties.
Potential effects	The sensitivity of the above receptors are medium to high and the magnitude of change is major adverse. Therefore, there is likely to be a direct, permanent, long-term negligible effect on Site users and existing downstream properties (' not significant ').
Additional mitigation	Subject to the implementation of the primary design mitigation embedded within the Proposed Development, as detailed above, no additional mitigation is considered to be required.
Residual effects and monitoring	The sensitivity of Site users and existing downstream properties is high and the magnitude of change, following mitigation, is negligible. Therefore, there is likely to be a direct, permanent, long-term negligible residual effect (' not significant ') on Site users and existing downstream properties following the implementation of mitigation measures.

Change in the Rate, Volume and Quality of Surface Water Runoff

Surface Water Quantity

- 12.6.29 The Proposed Development will lead to an increase in the extent of impermeable surfacing with the Site. This could lead to an increase in surface water runoff rates and volumes from the Site. Prior to mitigation, there is the potential for increased surface water flood risk to the surrounding area.
- 12.6.30 Any changes in surface water quantity during the operational phase are considered to be direct, of long term and permanent in nature.
- 12.6.31 However, the primary design mitigation in the form of the surface water drainage strategy will preserve the existing runoff regime of the Site. The proposed drainage infrastructure and storage will accommodate flows up to and including the 1 in 100-year storm with an appropriate allowance for future climate change, as well as an allowance for future urban creep for over the lifetime of the proposed residential development. The discharge rate from the Proposed Development will be restricted to the equivalent greenfield annual average runoff rate (QBAR). Therefore, the increase in runoff will be managed appropriately within the Proposed Development so that there are no adverse downstream impacts.
- 12.6.32 Therefore, the significance of the negligible magnitude effect on the medium sensitivity receptor is considered to be **negligible** (not significant).

Surface Water Quality

- 12.6.33 Pollutants associated with run-off from the Proposed Development have the potential to detrimentally affect water quality. There is potential for increased pollutant emissions and fuel contamination, associated with a potential increase in vehicles present on the Site and the Proposed Development itself. Surface water runoff may be of a lower quality as a result, which could reduce the quality of runoff directed to downstream surface water bodies.
- 12.6.34 However, the surface water drainage strategy, as primary design mitigation, will include measures that will provide an appropriate level of treatment to surface water runoff prior to discharge from the

Site. It is also noted that the Proposed Development may lead to a net reduction in diffuse pollution, following the proposed change in land use. This may result in an improvement in water quality in the receiving watercourses.

- 12.6.35 In addition, the primary design mitigation includes a proposed diversion of one of the ordinary watercourses within the Site. As a heavily modified water body under the WFD, the proposed de-culverting is expected to offer betterment to its existing condition, for example introducing aquatic habitat within new stretches of open channel. The proposed de-culverting is therefore considered to result in localised beneficial effects on WFD quality elements.
- 12.6.36 The magnitude of impact is therefore considered to be **minor beneficial**. Any changes in surface water quality during the operational phase are considered to be direct, of long term and permanent in nature. However, on the basis of the above discussion, it is predicted that the minor beneficial impact on the medium sensitivity receptor would result in a **minor beneficial** effect, which is not significant.

Table 12-12 – Assessment of potential effects, additional mitigation, residual effects and monitoring during operation: Change in the Quantity and Quality of Surface Water Runoff

Sensitive receptor	Local surface water bodies and the wider surface water catchment.
Potential effects	The sensitivity of the above receptors is medium and the magnitude of change is minor beneficial. Therefore, there is likely to be a direct, permanent, long-term minor beneficial effect on local surface water bodies and the wider catchment (' not significant ').
Additional mitigation	Subject to the implementation of a surface water drainage strategy as part of the primary design mitigation embedded within the Proposed Development, no additional mitigation is considered to be required.
Residual effects and monitoring	The sensitivity of local surface water bodies and the wider catchment is medium and the magnitude of change, following mitigation, is negligible. Therefore, there is likely to be a direct, permanent, long-term minor beneficial residual effect (' not significant ') on these sensitive receptors following the implementation of mitigation measures.

Change in the Quality of Runoff Infiltrating to Groundwater

- 12.6.37 There is the potential for water of a lower quality to enter groundwater as a result of increased vehicular presence and the possible introduction of pollutants, emissions and fuel spills. This may lead to reduced quality of local groundwater.
- 12.6.38 However, as above, the surface water drainage strategy will include appropriate measures that will treat runoff prior to it being discharged. The SDS (**Appendix 12.2**) outlines the use of above ground storage to provide a level of treatment to surface water runoff from the Proposed Development. As above, any changes in runoff quality to groundwater sources during the operational phase are considered to be direct, of long term and permanent in nature. The negligible magnitude effect on the medium sensitivity receptors is considered to be of **negligible** (not significant) significance.

Table 12-13 – Assessment of potential effects, additional mitigation, residual effects and monitoring during operation: Change in the Quality of Runoff Infiltrating to Groundwater

Sensitive receptor	Underlying aquifers and the underlying WFD groundwater body.
Potential effects	The sensitivity of the above receptors is medium and the magnitude of change is negligible. Therefore, there is likely to be a direct, permanent, long-term negligible effect on the underlying aquifers and WFD groundwater body (' not significant ').
Additional mitigation	Subject to the implementation of a surface water drainage strategy as part of the primary design mitigation embedded within the Proposed Development, no additional mitigation is considered to be required.
Residual effects and monitoring	The sensitivity of the underlying aquifers and WFD groundwater body is medium and the magnitude of change, following mitigation, is negligible. Therefore, there is likely to be a direct, permanent, long-term negligible residual effect (' not significant ') on these sensitive receptors following the implementation of mitigation measures.

Increase in Pressure on Local Foul Water Sewer Network

- 12.6.39 The occupation of the Proposed Development has potential to increase pressure on the local foul sewer network. Consultation with United Utilities will continue to be undertaken to confirm the magnitude of the potential impact on the local foul water network from an increase in flows from the Proposed Development. Should the existing network capacity not be sufficient, network upgrades may be required to be undertaken by the sewerage undertaker. Further consultation with United Utilities will continue as necessary to ensure the sewerage undertaker is aware of the development programme and can make any network upgrades that are considered necessary.
- 12.6.40 Any changes in foul flows from the Site, including trade effluent from the proposed employment use, during the operational phase are expected to be direct, of long term and permanent in nature. Based on the above, the magnitude of this effect is assumed to be minor adverse.
- 12.6.41 The minor adverse magnitude effect on the medium sensitivity receptor is considered to result in a **negligible** effect, which is not significant. Based on the assumptions above, no significant adverse effects have been predicted and no further mitigation is expected to be required.

Table 12-14 – Assessment of potential effects, additional mitigation, residual effects and monitoring during operation: Increase in Pressure on Local Foul Water Sewer Network

Sensitive receptor	Local foul water sewer network.
Potential effects	The sensitivity of the above receptor is medium and the magnitude of change is minor. Therefore, there is likely to be a direct, permanent, long-term negligible effect on the local foul water sewer network (' not significant ').
Additional mitigation	Subject to consultation with United Utilities and any network upgrades that may be taken by the sewerage undertaker, no additional mitigation is considered to be required.
Residual effects and monitoring	The sensitivity of the local foul water sewer network is medium and the magnitude of change, following mitigation, is negligible. Therefore, there is likely to be a direct, permanent, long-term negligible residual effect (' not significant ') on these sensitive receptors following the implementation of mitigation measures.

Increase in Pressure on Local Potable Water Supply Network

- 12.6.42 Whilst it is noted that United Utilities is considered by the EA to be in an area where water stress is 'not serious', the occupation of the Proposed Development is expected to increase demand for potable water. Consultation should be undertaken with the local water supplier to confirm that the local clean water network has capacity for the Proposed Development. Should any reinforcement works be required to meet the demand for the Proposed Development, these are the responsibility of the water supplier. The developer will work with the water supplier to ensure that any reinforcement measures are in place prior to the occupation of the Proposed Development, thus avoiding potential adverse impacts.
- 12.6.43 Subject to any measures to be undertaken by United Utilities, the effect is considered to be of minor magnitude. With regard for the medium sensitivity receptor, the impact is therefore considered to be of **negligible** significance (not significant).

Table 12-15 – Assessment of potential effects, additional mitigation, residual effects and monitoring during operation: Increase in Pressure on Local Potable Water Supply

Sensitive receptor	Local potable water supply.
Potential effects	The sensitivity of the above receptor is medium and the magnitude of change is minor. Therefore, there is likely to be a direct, permanent, long-term negligible effect on the local potable water supply (' not significant ').
Additional mitigation	Subject to consultation with the water supplier any reinforcement measures that may be undertaken by the water supplier, no additional mitigation is considered to be required.
Residual effects and monitoring	The sensitivity of the local potable water supply is medium and the magnitude of change, following mitigation, is negligible. Therefore, there is likely to be a direct, permanent, long-term negligible residual effect (' not significant ') on these sensitive receptors following the implementation of mitigation measures.

CUMULATIVE EFFECTS

- 12.6.44 All nearby committed developments will be subject to similar requirements of national planning policy and best practice as the Proposed Development, to limit surface water runoff and to manage water efficiently and sustainably, including with regards to climate change. As such, there are predicted to be no cumulative effects with other committed development with regards to the Water Environment. No additional mitigation measures are therefore required with regards to potential cumulative effects.

12.7 OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT

- 12.7.1 The use of above ground attenuation within the surface water drainage strategy will provide treatment through a 'SuDS treatment train' to ensure a suitable water quality standard of any surface water runoff generated from the Proposed Development.
- 12.7.2 As the Site currently comprises significant areas of arable farmland, there may be a net reduction in diffuse pollution sources from the site from agrichemicals, such as fertiliser and pesticides. This would in turn support an improvement in water quality in the receiving watercourses, which may have a positive implication on the WFD status of the wider surface water body.
- 12.7.3 As part of the Proposed Development, a watercourse diversion is proposed within the Site. The proposed de-culverting is expected to have amenity and biodiversity benefits, for example introducing aquatic habitat within new stretches of open channel. As a heavily modified water body under the WFD, the proposed de-culverting is expected to offer betterment to its existing condition and is considered to result in localised beneficial effects on WFD quality elements.

12.8 DIFFICULTIES AND UNCERTAINTIES

- 12.8.1 The desktop studies (**Appendix 12.1** and **Appendix 12.2**) undertaken as part of this assessment are based on available data from the EA, United Utilities and BGS. The accuracy of this information has not been verified. The EA data utilised to inform the Chapter and supporting FRA is understood to be the latest available data.

- 12.8.2 There is limited information available on the minor watercourses within the Site at the time of preparing this assessment. Additional information, such as additional CCTV surveys, will be required to inform the detailed design of the Proposed Development, the proposed drainage strategy and the proposed watercourse diversion.
- 12.8.3 This assessment assumes that a competent contractor will follow the latest best practice guidance on working near water, particularly when working in proximity to the ordinary watercourses within the Site. This assessment assumes that the use of latest best practice guidance will be formalised via a suitably worded planning condition.
- 12.8.4 This assessment assumes that a competent contractor will follow an appropriate CEMP to prevent effects on the Water Environment during the construction of the Proposed Development. It is assumed that a CEMP will be prepared prior to the commencement of each phase of development to secure the delivery of the identified mitigation, construction methods and monitoring requirements. This assessment assumes that the requirement of a CEMP will be formalised via a suitably worded planning condition.

12.9 SUMMARY

- 12.9.1 **Table 12-16** provides a summary of the findings of the assessment.

Table 12-16 - Summary of effects on the water environment

Receptor	Potential Effects	Significance of Effects Prior to Mitigation/Enhancement	Additional Mitigation	Residual Effects	Monitoring
Construction Phase					
Construction workers Existing downstream properties	Potential increase in fluvial and pluvial flood risk on and off Site.	Major Adverse (significant) T / D / MT	A CEMP will prevent adverse displacement of floodplain and prevent Site users being put at risk. This will be secured through a planning condition, to implemented by a competent contractor during construction.	Negligible (not significant) T / D / MT	N/A
Local surface water bodies Wider surface water catchment	Increased quantity (rate and volume) of surface water runoff. Decline in surface water quality of downstream receptors due to pollution resulting from construction works.	Moderate Adverse (significant) T / D / MT	A CEMP will include appropriate surface water management measures, to provide mitigation on surface water runoff quantity and quality. This will be secured through a planning condition, to implemented by a competent contractor during construction.	Negligible (not significant) T / D / MT	Within the CEMP, measures may include monitoring water quality of surface water flows leaving the Site, to ensure any mitigation measures are operating as intended.

Receptor	Potential Effects	Significance of Effects Prior to Mitigation/Enhancement	Additional Mitigation	Residual Effects	Monitoring
Underlying aquifers Underlying WFD groundwater body	Decline in quality of runoff infiltrating to groundwater due to pollution resulting from construction works.	Moderate Adverse (significant) T / D / MT	A CEMP will include appropriate surface water management measures, to manage surface water runoff quality. This will be secured through a planning condition, to implemented by a competent contractor during construction.	Negligible (not significant) T / D / MT	Within the CEMP, measures may include monitoring water quality of surface water flows leaving the Site, to ensure any mitigation measures are operating as intended.
Local foul water sewer network	Increase in foul water generated on Site, resulting in increased pressure on the local foul water network.	Negligible (not significant) T / D / MT	A CEMP will include appropriate measures to dispose of foul water generated during the construction phase. This will be secured through a planning condition, to implemented by a competent contractor during construction.	Negligible (not significant) T / D / MT	N/A
Local potable water supply	Increased demand on the local water supply.	Negligible (not significant) T / D / MT	Subject to consultation, no additional mitigation measures are considered to be required.	Negligible (not significant) T / D / MT	N/A

Receptor	Potential Effects	Significance of Effects Prior to Mitigation/Enhancement	Additional Mitigation	Residual Effects	Monitoring
Operational Phase					
Site users Existing downstream properties	Potential increase in fluvial and pluvial flood risk on and off Site.	Negligible (not significant) P / D / LT	N/A	Negligible (not significant) P / D / LT	N/A
Local surface water bodies Wider surface water catchment	Increased quantity (rate and volume) of surface water runoff. Decline in surface water quality of downstream receptors due to pollution from the Proposed Development.	Minor Beneficial (not significant) P / D / LT	N/A	Minor Beneficial (not significant) P / D / LT	N/A
Underlying aquifers Underlying WFD groundwater body	Decline in quality of runoff infiltrating to groundwater due to pollution from the Proposed Development.	Negligible (not significant) P / D / LT	N/A	Negligible (not significant) P / D / LT	N/A
Local foul water sewer network	Increase in foul water generated on Site, resulting in increased pressure on the local foul water network.	Negligible (not significant) P / D / LT	Subject to consultation, no additional mitigation measures are considered to be required.	Negligible (not significant) P / D / LT	N/A

Receptor	Potential Effects	Significance of Effects Prior to Mitigation/Enhancement	Additional Mitigation	Residual Effects	Monitoring
Local potable water supply	Increased demand on the local water supply.	Negligible (not significant) P / D / LT	Subject to consultation, no additional mitigation measures are considered to be required.	Negligible (not significant) P / D / LT	N/A

Key to table:

P / T = Permanent or Temporary, D / I = Direct or Indirect, ST / MT / LT = Short Term, Medium Term or Long Term, N/A = Not Applicable

12.10 REFERENCES

- **Reference 12.1:** UK Government (2010) The Flood and Water Management Act.
- **Reference 12.2:** UK Government (2014) The Water Act.
- **Reference 12.3:** UK Government (2017) The Water Environment (Water Framework Directive) (England and Wales) Regulations.
- **Reference 12.4:** UK Government (1991) The Water Industry Act.
- **Reference 12.5:** Rochdale Borough Council (2016) Rochdale Adopted Core Strategy.
- **Reference 12.6:** Greater Manchester Combined Authority (2024) Places for Everyone Plan 2022 to 2039.
- **Reference 12.7:** Rochdale Metropolitan Borough Council (2012) Climate Change Adaptation Supplementary Planning Document.
- **Reference 12.8:** UK Government (2024) National Planning Policy Framework.
- **Reference 12.9:** UK Government (2023) Planning Practice Guidance.
- **Reference 12.10:** Highways England (2020) LA 113 Road Drainage and the Water Environment.
- **Reference 12.11:** Environment Agency (2022) Flood Risk Assessments: Climate Change Allowances.
- **Reference 12.12:** Environment Agency (2022) North West River Basin District River Basin Management Plan.
- **Reference 12.13:** JBA Consulting (2019) Level 1 Strategic Flood Risk Assessment for Greater Manchester – Update.
- **Reference 12.14:** JBA Consulting (2020) Greater Manchester Level 2 Hybrid Strategic Flood Risk Assessment.
- **Reference 12.15:** JBA Consulting (2018) Greater Manchester Strategic Flood Risk Management Framework.
- **Reference 12.16:** JBA Consulting (2011) Rochdale Metropolitan Borough Council Preliminary Flood Risk Assessment.
- **Reference 12.17:** Rochdale Metropolitan Borough Council (2017) Preliminary Flood Risk Assessment Addendum.
- **Reference 12.18:** Rochdale Borough Council (2014) Rochdale Borough's Strategy for Flood Risk Management 2014 - 2024.
- **Reference 12.19:** Masters-Williams H., Heap A., Kitts H., Greenshaw L., Davis S., Fisher P., Hendrie M. and Owens D. (2001) Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors.
- **Reference 12.20:** Lancaster J. W., Preene M. and Marshall C. T. (2004) Development and Flood Risk – Guidance for the Construction Industry.
- **Reference 12.21:** Woods Ballard B., Wilson S., Udale-Clarke H., Illman S., Scott T., Ashley R. and Kellagher R. (2015) The SuDS Manual.
- **Reference 12.22:** Environment Agency (2014) Pollution Prevention Guidance.
- **Reference 12.23:** Department for Environment, Food and Rural Affairs (2015) Sustainable Drainage Systems: Non-Statutory Technical Standards for Sustainable Drainage Systems.

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