



**DRAINAGE & WASTEWATER
MANAGEMENT PLAN (DWMP24):
ENVIRONMENTAL REPORT**

STRATEGIC ENVIRONMENTAL
ASSESSMENT –ENVIRONMENTAL
REPORT

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Prepared for:

Yorkshire Water

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Stantec



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

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Table of Contents

1.0	INTRODUCTION	5
1.1	INTRODUCTION.....	5
1.2	OVERVIEW OF YORKSHIRE WATER’S DWMP24	5
1.3	CHANGES FROM DRAFT TO FINAL DWMP	9
1.4	RELEVANT DWMP24 GUIDANCE.....	12
1.5	STRATEGIC ENVIRONMENTAL ASSESSMENT PROCESS	14
1.6	DIFFICULTIES FACED AND LIMITATIONS.....	16
2.0	POLICY CONTEXT	18
2.1	REVIEW OF RELEVANT PLANS, PROGRAMMES AND OBJECTIVES.....	18
3.0	BASELINE ENVIRONMENT	21
3.1	BASELINE CONTEXT	21
3.2	KEY ISSUES AND OPPORTUNITIES.....	22
3.3	SPATIAL BASELINE CONTEXT	27
4.0	SEA ASSESSMENT METHODOLOGY	30
4.1	SEA OBJECTIVES AND FRAMEWORK	30
4.2	SEA ASSESSMENT METHODOLOGY.....	33
4.3	HOW ARE LEVEL 2 SPAS TO BE ASSESSED?	35
5.0	DEVELOPMENT AND ASSESSMENT OF INDIVIDUAL OPTIONS	36
5.1	DWMP24 PROCESS AND COMPATIBILITY WITH THE SEA	36
5.2	OPTION DEVELOPMENT AND CONSIDERATION OF REASONABLE ALTERNATIVES	37
5.3	SEA ASSESSMENT OF OPTIONS (LEVEL 1).....	41
5.4	SEA ASSESSMENT OF OPTIONS (LEVEL 2).....	53
6.0	DEVELOPMENT AND ASSESSMENT OF THE OPTIONS FOR THE OVERALL DWMP	63
6.1	DEVELOPMENT OF APPROACH AND SCENARIOS	63
6.2	SEA ASSESSMENT OF THE PLANS	65
6.3	OTHER RELATED ASSESSMENTS INCLUDING HRA	68
7.0	SEA ASSESSMENT OF THE PREFERRED PLAN DWMP24 AND CUMULATIVE EFFECTS	70
8.0	MEASURES TO PREVENT, REDUCE AND AS FULLY AS POSSIBLE OFFSET ANY SIGNIFICANT ADVERSE EFFECT	76
8.1	MEASURES ADOPTED WITHIN THE DEVELOPMENT OF THE PLAN.....	76
8.2	PROJECT STAGE IMPLEMENTATION	78
8.3	RECOMMENDATIONS FOR SUBSEQUENT DWMP CYLCES	81



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

9.0 MONITORING THE SIGNIFICANT EFFECTS OF THE PLAN.....83
9.1 PROPOSED MONITORING83

APPENDICES.....85
APPENDIX A CONSULTEE COMMENTS
APPENDIX B REVIEW OF RELEVANT PLANS, PROGRAMMES AND ENVIRONMENTAL PROTECTION OBJECTIVES
APPENDIX C ENVIRONMENTAL BASELINE REVIEW AND FUTURE TRENDS
APPENDIX D SEA LEVEL 2 RESULTS



Abbreviations

List of Abbreviations	
AMP	Asset Management Plan
AONB	Area of Outstanding Natural Beauty
AQMA	Air Quality Management Area
BNG	Biodiversity Net Gain
BRAVA	Baseline Risk and Vulnerability Assessment
Defra	Department for Environment, Food and Rural Affairs
DWF	Dry Weather Flow
DWMP24	Drainage and Wastewater Management Plan
GhG	Greenhouse Gas
HRA	Habitats Regulations Assessment
INNS	Invasive non-native species
L1/ L2/ L3	Level 1, 2, or 3 areas within the DWMP24
LLFA	Lead Local Flood Authority
LNR	Local Nature Reserve
MCZ	Marine Conservation Zone
NCA	National Character Area
NNR	National Nature Reserve
NRV	Non-Return Valves
ODA	Option Development and Appraisal
ODPM	Office of the Deputy Prime Minister
Ofwat	Water Services Regulation Authority



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

PC	Performance Commitment
PO	Planning Objective
PR24	2024 Price Review
PRoW	Public Rights of Way
RBCS	Risk Based Catchment Screening
RBD	River Basin District
RBMP	River Basin Management Plan
RNAG	Reason for Not Achieving Good
SAC	Special Areas of Conservation
SEA	Strategic Environmental Assessment
SO	Storm Overflow
SODRP	Storm Overflow Discharge Reduction Plan
SPA	Strategic Planning Area (please note that SPA to an environmental audience usually refers to a 'Special Protection Area' - in this report this term is not abbreviated)
SSSI	Sites of Special Scientific Interest
STW	Sewage Treatment Works
SuDS	Sustainable Drainage Systems
uFMfSW	updated Flood Map for Surface Water
UKCP	UK Climate Projections
WASCS	Water and Sewerage Companies
WFD	Water Framework Directive
WHS	World Heritage Site
WRZ	Water Resource Zones
YW	Yorkshire Water
P4Y	Partnership for Yorkshire



1.0 INTRODUCTION

1.1 INTRODUCTION

This Environmental Report sets out the findings of Stages B and C of the Strategic Environmental Assessment (SEA) process, to support the development of the Yorkshire Water (YW) Drainage and Wastewater Management Plan (DWMP24). DWMPs are guided by Water UK's 'A framework for the production of Drainage and Wastewater Management Plans' (subsequently referred to as the 'Water UK framework'). DWMPs set out the long-term investment plan for drainage, wastewater and environmental water quality, defining priorities for investment.

SEA provides an opportunity to consider ways by which the plan can contribute to improvements in environmental conditions; as well as a means of identifying and mitigating any potential adverse environmental effects that the plan might otherwise have. It informs the decision-making process through the identification and assessment of significant and cumulative effects a plan or programme may have on the environment. By doing so, it helps make sure that the proposals in the plan are the most appropriate given the reasonable alternatives. The SEA process is conducted at a strategic level and enables consultation on the potential effects of a plan with a wide range of stakeholders.

The Water UK framework advises that as DWMPs are not currently a statutory requirement, they do not fall within the remit of the SEA Regulations; however, it is best practice to undertake SEA on the final optimised plan. DWMPs will become a statutory requirement under the Environment Act 2021 which introduces Drainage and Sewerage Management Plans (otherwise known as a DWMP24) for cycle 2. None the less, YW have undertaken steps to fulfil the requirements of the SEA Regulations. In order that the SEA process is effective in influencing the plan, YW has chosen to integrate SEA into the earlier option definition and appraisal stages in addition to the final optimised plan.

YW recognises that to get the best outcomes for all in the region, it needs to work collaboratively with customers and all organisations who have an interest in the issues – including stakeholders with an interest in planning, development, risk management and the environment.

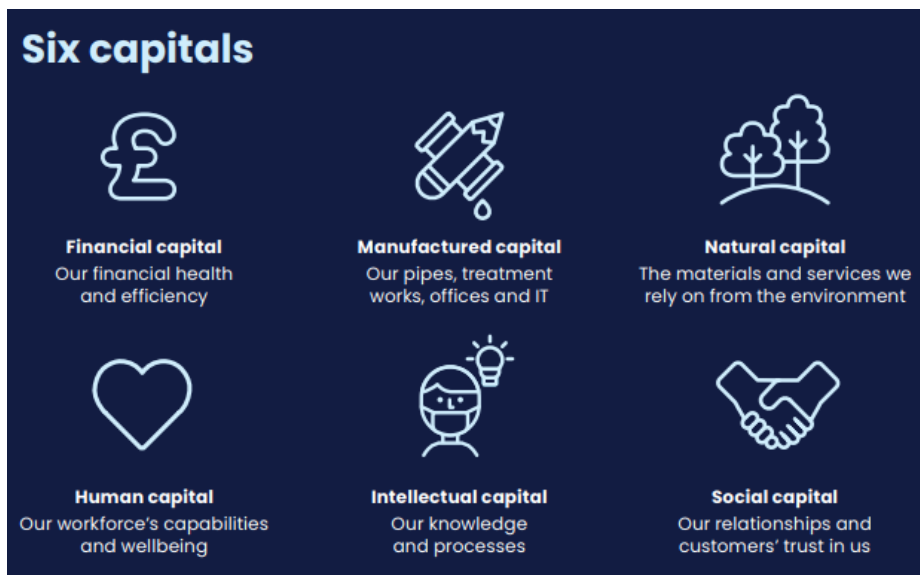
1.2 OVERVIEW OF YORKSHIRE WATER'S DWMP24

The DWMP24 takes a long-term view to set out how YW intend to extend, improve, and maintain a robust and resilient drainage and wastewater system encompassing the next 25 years and beyond to meet the requirements of YW's long-term ambitions of reducing the risk of hydraulic modelled flooding and protecting and enhancing the environment. Reducing the impact of their storm overflows on river water quality.



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

Overall, YW adopt a Six Capitals approach within decision making, to represent the resources on which they rely and impact and to expand understanding of risk. The Six Capitals are shown below:



The DWMP24 considers all aspects of the existing YW wastewater networks (foul, combined and surface water), Wastewater Treatment Works (WwTW), the interconnecting drainage systems from other Risk Management Authorities, such as local authorities and the EA and how these impact the environment, including discharges to rivers, streams, and other waterbodies.

The DWMP24 identifies changes in level of risk to the core YW wastewater services across a range of time horizons, exploring the risks arising from climate change, population growth and creep and the effects these may have on the levels of service provided. A baseline of 2020 has been used, with the plan covering 2025-2050 risks.

The first cycle of the DWMP24 for YW is primarily focused on modelled hydraulic capacity of the wastewater system and changing future risk to sewer flooding, storm overflow operation and wastewater treatment works compliance, as a result of factors such as growth and climate change.

The levels of service considered through the DWMP24 are:

- Modelled storm overflow performance – spills
- Modelled hydraulic flood risk (internal sewer flooding and external sewer flooding)
- WwTW compliance flow and quality

The DWMP has considered different scenarios to meet statutory requirements for these issues, along with non-statutory ambitions, whilst providing the preferred plan, or the least cost. The DWMP24 will inform the PR24 (Price Review 24) planning process and represents an overall strategic 25-year plan. As



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

such, the outputs of the DWMP24 will be reviewed in context with all other priorities affecting water companies including affordability to customers.

The overall study area aligns with the operational boundary for YW's provision of wastewater services, as shown by the red line boundary in **Figure 1.2.1**. This 'Level 1' is split into seventeen Strategic Planning Areas (SPA) (Level 2) which are generally aligned with the Environment Agency's (EA) river basins alongside four urban areas (Hull, Leeds, Sheffield, and York). These are further split into 617 catchments, (Level 3) (depicted by green shading). **Figure 1.2.2** visualises these levels for the reader's assistance.



Figure 1.2.1 – DWMP24 Study Area

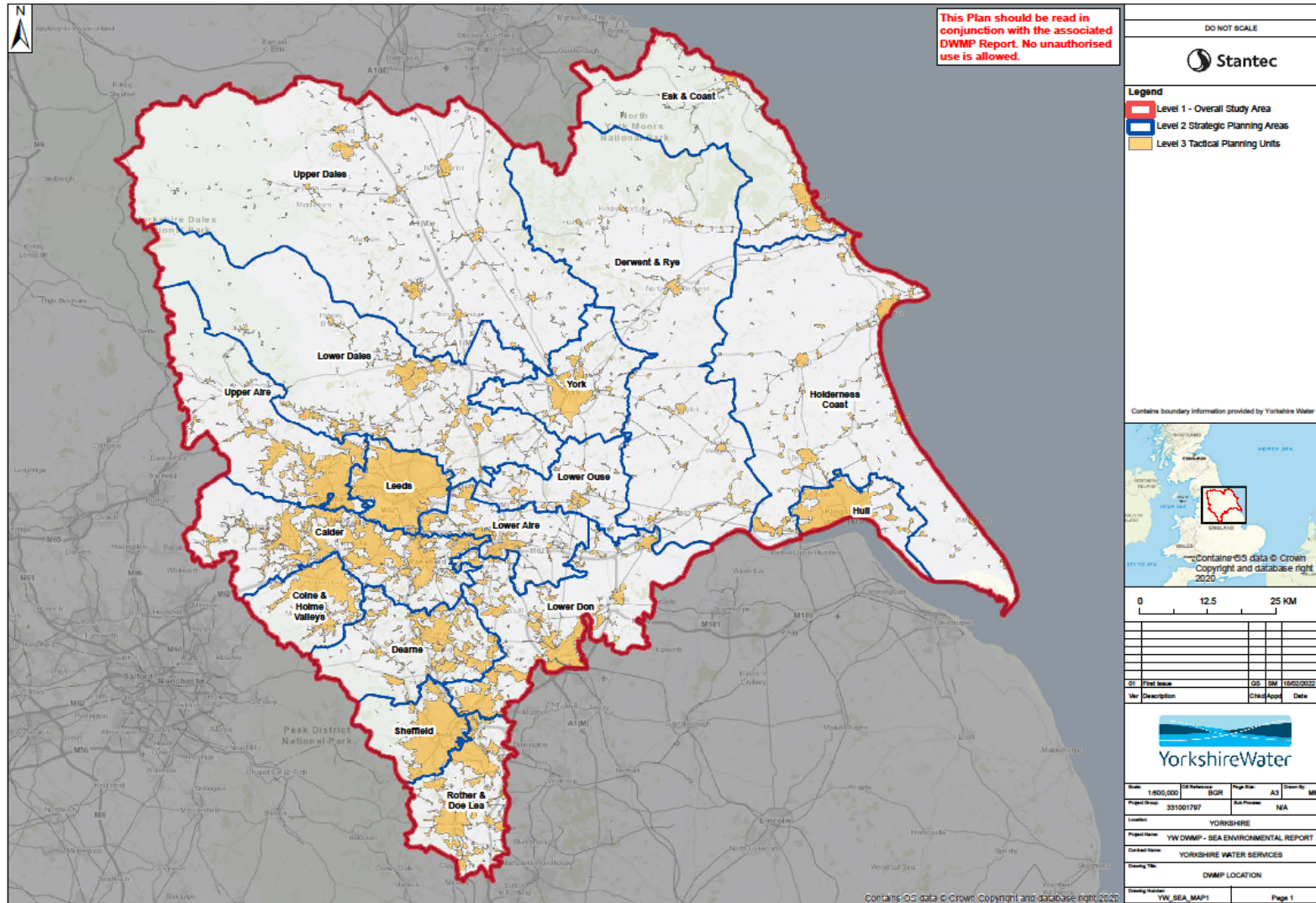
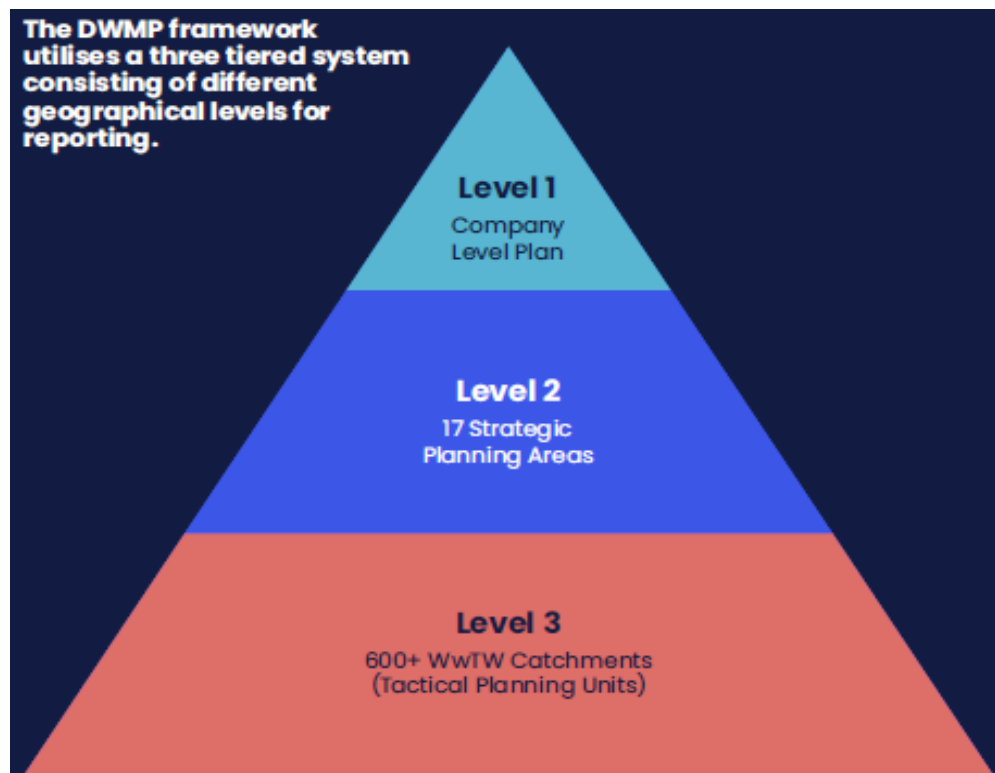


Figure 1.2.2 visualises these levels for the reader's assistance.

Figure 1.2.2 – Visualised Level System for the DWMP24



1.3 CHANGES FROM DRAFT TO FINAL DWMP

1.3.1 Consultation of draft DWMP24

Consultation was launched on the 1 July 2022 on the draft DWMP24 and ran for 12 weeks until 23 September 2022. A number of questions were posed to help understand what the customers, stakeholders and regulators wanted in terms of direction of the plan, how the plan had been built up and also thinking about the proposed scenarios, and the costs of plan presented. The outcomes of this survey were analysed and informed the final DWMP.

Responses on the dDWMP24 and Strategic Environmental Assessment (SEA) were received from the regulators Ofwat, the Environment Agency and a number of other stakeholders including the Consumer Council for Water (CCW), Natural England and Historic England, a number of Rivers Trusts, five local councils, a catchment-based partnership, a National Park and eleven customers. Ofwat and the Environment Agency provided full written responses with recommendations for improvements. This was also followed up by a multi-agency feedback session facilitated by Defra, which CCW also attended.



There are several key themes included in the responses received:

- Importance of partnership working.
- Support for a Best Value Plan (BVP) approach.
- Requirement to demonstrate compliance with all aspects of the Storm Overflows Discharge Reduction Plan (SODRP1).
- Provide increased clarity on the short, medium, and long-term elements of our plan.
- Support for reducing the levels of flood risk at properties.

Figure 1, Figure 1.3.2 and Error! Reference source not found. **summarise** the outcomes from the consultation.



Figure 1.3.1 - Consultation Responses Summary

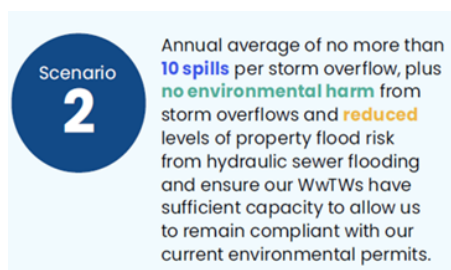


Figure 1.3.2 - Preferred Scenario Feedback

¹ <https://www.gov.uk/government/publications/storm-overflows-discharge-reduction-plan>



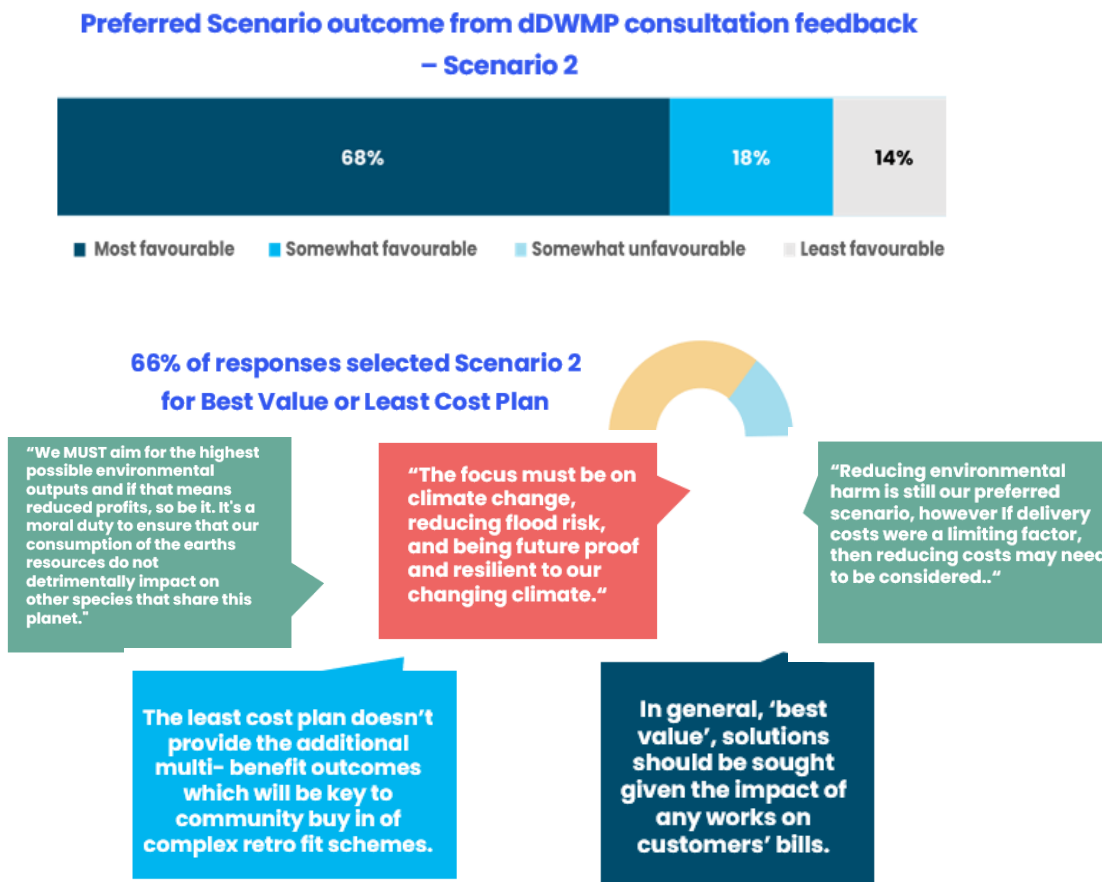


Figure 1.3.3 - Support for Scenario 2 Best Value Plan (BVP) or Least Cost Plan

In addition to the individual response to the Yorkshire Water draft DWMP, Ofwat and the Environment Agency provided an industry overview which have been taken into consideration in the development of the final DWMP. The responses have been provided within the Statement of Response (**Appendix A**).

1.3.2 Statement of Response

The statement of response to consultation feedback was published in January 2023. Here is a link to the document: yw-statement-of-response-january-2023.pdf (yorkshirewater.com) and also provided in **Appendix A**. It outlines feedback to points raised by our regulators, stakeholders and customers. We have answered the query, signposted inclusion in our final draft or will look to incorporate the feedback in cycle 2.

1.3.3 Changes from Draft to Final

The publication of the Storm Overflows Discharge Reduction Plan (SODRP) in August 2022 amended the focus of the DWMP to achieve the following time-bound targets:



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

- by 2035, water companies to improve all storm overflows discharging into or near every designated bathing water; and improve 75% of overflows discharging to high priority nature sites.
- by 2050, this will apply to all remaining storm overflows, regardless of location

Based on the feedback received, the approach to the DWMP between draft and final has changed, predominately to incorporate all the storm overflow assets at YW but also to develop flood clusters at level 4 catchments, linking them to storm overflows where applicable.

Sensitivity testing has been incorporated within the plan to allow for more adverse climate change rates and also population growth predictions. Potential bill impacts have been included for the plan, but this is stand alone and not linked to any bill increases for AMP8 and beyond. This will be determined by Ofwat based on the PR24 submission.

All aspects of the WINEP have been included within the plan costs (these are appraised and submitted separately on a scheme by scheme basis through the WINEP process) and the approach to short-, medium- and long-term planning has been reviewed. Asset health metric and performance commitment information have been included within our final plans to increase the robustness of the plan in the long-term.

The Options Development and Appraisal sections have been reworked to reflect the new approach to solution build up, costing and benefits appraisal.

The plan has changed from a true catchment-based approach to one of specific delivery of the SODRP whilst trying to maintain links to modelled hydraulic flood risk and WwTW performance to ensure that the most effective solutions are delivered. All available data will be reviewed as schemes are developed, including asset health metrics.

1.4 RELEVANT DWMP24 GUIDANCE

The Water UK framework sets out the following steps for developing the DWMPs, as shown in **Figure 1.4.1**.



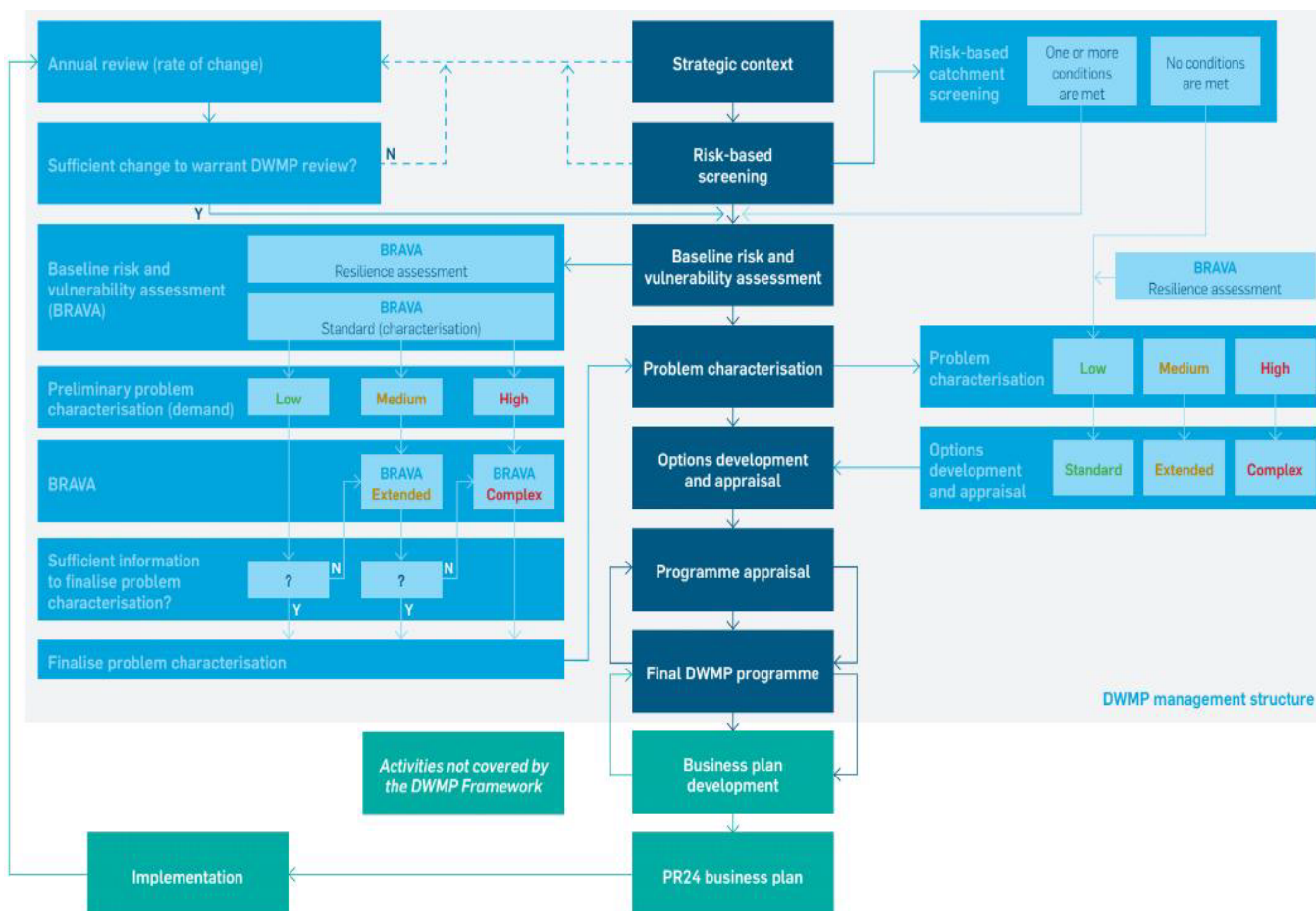


Figure 1.4.1 – DWMP24 Process Diagram from Water UK framework

English and Welsh water and wastewater companies that are subject to regulatory price controls have committed to produce DWMPs in accordance with the Water UK framework^{Error! Bookmark not defined.}. The framework results from collaboration between many organisations including Blueprint for Water; Consumer Council for Water; Defra; the Environment Agency; Natural Resources Wales; Ofwat; the Association of Directors of Environment, Economy, Planning and Transport; the Welsh Government; and water companies themselves.

The SEA Process has been completed on the overall plan but has also fed into its creation as is good practice. That means that SEA is not a standalone activity within a stage of the DWMP24 process shown above and aligns to many of the stages shown in dark blue within **Figure 1.4.1**. Further details on the alignment of the SEA to the DWMP24 process are set out in **Section 1.5** below.



1.5 STRATEGIC ENVIRONMENTAL ASSESSMENT PROCESS

Article 2(b) of the SEA Directive (Directive 2001/42/EC) defines 'environmental assessment' as a procedure including:

- Preparation of an Environmental Report (including documenting the likely significant environmental effects of the plan, including reasonable alternatives).
- Undertaking consultation on the plan.
- Taking the Environmental Report and consultation results into account in decision-making.
- Providing information when the plan is adopted and showing how the results of the environmental assessment have been considered.

The SEA Directive was transposed into UK law via the Environmental Assessment of Plans and Programmes Regulations 2004 ('SEA Regulations'). The SEA Regulations require an assessment of the effects on the environment of "plans and programmes which are prepared for water management and sets the framework for development consents". The UK Government Practical Guide to SEA, the 'Practical Guide'², establishes the following stages of the SEA process, summarised as:

- Stage A of the SEA process sets the context, identifies objectives, problems, and opportunities, and establishes an environmental baseline through a scoping stage.
- Stage B is the impact assessment phase when options are developed and refined through assessment.
- Stage C is the recording stage which cumulates in the preparation of this Environmental Report.
- Stage D is a consultation phase on the draft Plan and Environmental Report.
- Stage E is the subsequent monitoring of the significant effects of the implementation of the DWMP24 on the environment.

Stage A was completed through preparation and consultation on an SEA Scoping Report during early 2022.

Schedule 2 of the SEA Regulations sets out what information environmental reports should contain, and this is detailed in **Table 1.5.1**, which also identifies where the information is provided in this report.

² Office of the Deputy PM (2005) A Practical Guide to the Strategic Environmental Assessment Directive, available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/7657/practicalguidesea.pdf, accessed May 2022.



Table 1.5.1. – Environmental Report requirement and where this information is provided

SEA Regulations, Schedule 2 Information for Environmental Reports	Where the information is provided in this SEA Environmental Report
1. An outline of the contents and main objectives of the plan or programme, and of its relationship with other relevant plans and programmes.	Section 1.
2. The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme.	Section 3 and Appendix C.
3. The environmental characteristics of areas likely to be significantly affected.	Section 3 and Appendix C.
4. Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Council Directive 79/409/EEC on the conservation of wild birds and the Habitats Directive.	Section 3, and Appendices B, and C.
5. The environmental protection objectives, established at international, (European) Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation.	Section 2 and Appendix B.
6. The likely significant effects on the environment, including short, medium and long-term effects, permanent and temporary effects, positive and negative effects, and secondary, cumulative and synergistic effects, on issues such as— (a) biodiversity; (b) population; (c) human health; (d) fauna; (e) flora; (f) soil; (g) water; (h) air; (i) climatic factors; (j) material assets; (k) cultural heritage, including architectural and archaeological heritage; (l) landscape; and (m) the inter-relationship between the issues referred to in sub-paragraphs (a) to (l).	Section 5, 6 and 7
7. The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme.	Section 8
8. An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information.	Section 5 and 6
9. A description of the measures envisaged concerning monitoring in accordance with regulation 17.	Section 9
10. A non-technical summary of the information provided under paragraphs 1 to 9.	Non-Technical Summary

The draft Environmental Report was published in June 2022 for consultation, with the draft DWMP. This Environmental Report represents the output from the consultation of the draft plan or programme and the Environmental Report.

A key aim of the SEA process is to ensure the appraisal is proportionate, relevant, and informative to the Plan being assessed. The Scoping Report ‘scoped in’ all the ‘SEA topics’ identified in item 6 within **Table 1.5.1.**

The relationship between the DWMP24 process and SEA process is set out in **Table 1.5.2:**



Table 1.5.2. – Relationship between DWMP24 Process and SEA

DWMP24 Stage	Overview	SEA Stage
Strategic Context	The strategic context document outlines the purpose of the DWMP24, the objectives and the needs and drivers to be considered in producing the first DWMP24.	SEA scoping phase, documented in Scoping Report.
Risk Based Catchment Screening (RBCS)	A process to assess and prioritise catchments for further investigation based on a number of screening criteria set out in the DWMP24 framework.	
Baseline Risk and Vulnerability Assessment (BRAVA)	Hydraulic modelling and desk top studies to quantify changing risks over time from climate change and population growth. The assessment considers historic performance data such as flooding incidents.	
Problem Characterisation	The risks ('problems') identified by BRAVA are characterised to assess the scale of the risk and the impact it may have to determine the level of optioneering needed.	
Options Development and Appraisal (ODA)	Exploration of the available options and solutions to mitigate the risks. Including identification of solutions which may be delivered in partnership with others.	Assessed in Section 5 and 6 of this report.
Programme Appraisal	Select options for delivery based on 'best value' and prioritise the interventions, balancing the impact of cost to customers and the natural capital approaches.	Assessed in Section 6 of this report.
Draft DWMP24	The draft DWMP24 was issued at the end of June 2022 for a period of consultation and customer research.	The draft DWMP was assessed through the SEA process to inform the development of the plan.
Final DWMP24	The final DWMP is being published in May 2023, taking into account the views of consultees. The final plan will inform Business Plan development as part of Price Review (PR24).	Following consultation feedback, the final DWMP was assessed through the SEA to inform the development of the plan. This final SEA Environmental Report is being published in parallel with the plan.

1.6 DIFFICULTIES FACED AND LIMITATIONS

This report relies on baseline data and information published by third parties. The datasets used have been published by third party organisations and as such neither Stantec or YW are liable for their accuracy. Whilst the most up to date information has been considered, datasets are regularly reviewed and therefore could change during the SEA Process.



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

Section 3 (Baseline) has used professional judgement to review published datasets. The baseline information is provided at the strategic level, thus it does not identify some local issues, as these may not represent wider trends across the region. Post SEA, optioneering and project development will identify specific locations and schemes where additional local datasets and baseline information are likely to be required to assess and manage environmental and social impacts. The baseline environment appendix also includes an assessment of a future environmental baseline. The very nature of this predictive assessment means that there is uncertainty in the reporting; for some topics predictions are available (albeit with variability in the spatial and temporal projections (e.g., predictions over 20-years or 25-years); others are reliant on professional judgement and observed trends.

Within **Section 5**, options are assessed as stand-alone measures; **Section 6** assesses the overall approach taken in the plan based on the combination of options and wider measures within the plan, along with other reasonable alternative approaches. The plan's preferred approach is at the strategic level, using a grey or green/grey approach for catchments. As the plan progresses through implementation these will be developed into more specific schemes, such as below ground storage with uses of green surface water management options. There will naturally be some fluidity within the implementation of measures that arise from the plan, such as the proportion of blue-green and grey options within a catchment based on subsequent more detailed work. Whilst this limits the certainty within the assessment, it offers the potential to increasingly adopt the green and collaborative approaches as practices develop.

The Storm Overflows Discharge Reduction Plan (SODRP) was published on 26 August 2022, changing the targets to be met by DWMPs (refer to Section 2.2 for more details). The DWMP24 prioritises investment over a 25-year horizon from 2025, PR24 will focus the investment over the next five-years (AMP8). It is recognised that levels of confidence of the impacts and uncertainty increase in the longer-term planning horizon, noting that the plan is to be reviewed every five-years.

As the development of DWMPs is a new evolving area, some iteration in the DWMP and SEA process is expected as the next cycles of the DWMP are developed. The five-year review cycle provides an opportunity to review the current findings based on the experience gained within the implementation of this first DWMP24.

The DWMP24 adopts an adaptive planning approach to ensure that the DWMPs are adaptive and responsive to issues such as climate change, based on early warning markers (such as climate modelling forecasts and emerging research) whereby higher levels of investment maybe required if higher risks emerge. By its nature, this increases uncertainty in the environmental effects (both positive and negative) of the plan, although is anticipated to improve the environmental effects.



2.0 POLICY CONTEXT

The SEA Regulations require the environmental report to include:

An outline of the contents and main objectives of the plan or programme, and of its relationship with other relevant plans and programmes. (SEA Regulations (2004), Schedule 2, paragraph 1).

The environmental protection objectives, established at international, Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation. (SEA Regulations (2004), Schedule 2, paragraph 5).

2.1 REVIEW OF RELEVANT PLANS, PROGRAMMES AND OBJECTIVES

A full review of the Plans, Programmes and Environmental Protection Objectives relevant to the DWMP24 can be found in **Appendix B** in tabular format. These have been reviewed to establish, where relevant, the requirements applicable to the plan, identify constraints, opportunities, and potential inconsistencies and to inform the development of the SEA Framework and subsequent assessment. The next two sections identify the key requirements of the SODRP, which is a key driver for the plan, and the key themes and messages from other relevant plans, programmes and objectives.

2.1.1 Key Requirements of SODRP

The Storm Overflows Discharge Reduction Plan (SODRP) was published on 26 August 2022 changing the targets to be met by DWMPs (refer to Section 2.2 for more details).

Protecting the environment

Headline target: Water companies will only be permitted to discharge from a storm overflow where they can demonstrate that there is no local adverse ecological impact.

Sub-targets:

- *The headline target must be achieved for most (at least 75%) of storm overflows discharging in or close to high priority sites by 2035.*
- *It must be achieved for all (100%) storm overflows discharging in or close to high priority sites by 2045.*
- *Water companies must achieve this target for all remaining storm overflows sites by 2050.*

Protecting public health in designated bathing waters



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

Headline target: Water companies must significantly reduce harmful pathogens from storm overflows discharging into and near designated bathing waters, by either: applying disinfection; or reducing the frequency of discharges to meet Environment Agency spill standards by 2035.

Ensuring storm overflows operate only in unusually heavy rainfall events

Headline target: Storm overflows will not be permitted to discharge above an average of 10 rainfall events per year by 2050.

Sub-target: Water companies will be required to ensure all storm overflows have screening controls.

2.1.2 Key Themes of Plans, Programmes and Objectives

The key themes and messages arising from the applicable plans, programmes, and objectives can be cumulatively summarised as follows in **Table 2.2.1**:

Table 2.2.1. – Key themes and messages of applicable Plans, Programmes and Objectives

SEA Topic	Key theme and messages
Biodiversity and Geodiversity	<ul style="list-style-type: none"> • Conserve and enhance biodiversity, including designated and non-designated sites, priority habitats and species. • Contribute to nature recovery networks to increase habitat connectivity, including through green infrastructure. • Prevent habitat fragmentation. • Increase resilience of biodiversity to climate change. • Support biodiversity net gain (BNG). • Support the UK Government 25-Year Plan to Improve the Environment. • Protect resources such as high-quality soils, good quality agricultural land and mineral resources. • Promote catchment-wide approach to land management by relevant stakeholders. • Have regard to the requirements of the Habitats Directive, including restoring favourable conservation status to sites. • Use all reasonable endeavors to avoid any pollution or deterioration in the habitat of wild birds. • Reduce risk of contamination and contribute to remediation.
Human Health	<ul style="list-style-type: none"> • Recognise open spaces, water resources and access to nature are important to support human health, well-being, community cohesion and meet recreation needs. • Ensure communities are safe, prevent flood risks to human health. • Ensure communities have secure water supplies and effective wastewater services. • Promote efficient use of water • Foster social inclusion and community stakeholder participation.
Socio-economic	<ul style="list-style-type: none"> • Promote a sustainable economy for social and economic prosperity, such as through protection of important infrastructure. • Reduce social deprivation and inequality.



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

SEA Topic	Key theme and messages
	<ul style="list-style-type: none"> Promote a green economy
Carbon & Material Assets	<ul style="list-style-type: none"> Contribute to net zero carbon targets. Utilise resources efficiently throughout the lifecycle of a scheme. Prevent and reduce waste generation, including hazardous wastes. Encourage effective use of land, such as reuse of previously developed land and multifunctional use of land. Reduce harmful air pollutants, especially in sensitive areas.
Water Resources	<ul style="list-style-type: none"> Improve water quality in all water bodies to meet WFD targets and designated site targets (for water quality and flow), as outlined in SSSI Definitions of Favourable Conservation Status. Prevent or limit pollutants into water resources (groundwater, surface water, coastal water), including wastewater discharges from treatment works and storm overflows. Develop approaches resilient to climate change (extremes of weather, flood, drought, low flow etc). Promote efficient use of water. Contribute to healthy seas and oceans. Support aquatic biodiversity and ensure high quality drinking water resources. Support improvements that will benefit bathing water quality.
Flood Risk	<ul style="list-style-type: none"> Reduce and manage flood risk. Increase resilience to flooding from all sources. Support a catchment wide approach to water management.
Heritage	<ul style="list-style-type: none"> Assess, and avoid, minimise and/or mitigate as appropriate, any impacts to heritage assets. Avoid effects resulting from changes to water level (surface or sub-surface) on all historical and cultural assets, including undiscovered resources. Reduce the vulnerability and improve the resilience of heritage assets to flooding where works are proposed. Assess the potential impact of change in groundwater flows and chemistry on preserved organic and paleoenvironmental remains. Promote the conservation and enhancement of the historic environment, including historic landscapes.
Landscape	<ul style="list-style-type: none"> Protection of landscape, townscape, and seascape (including designated landscapes and landscape character). Changes in water levels in the landscape (such as through low flows in rivers or flooding) could affect landscape and visual amenity.
Climate Change Resilience	<ul style="list-style-type: none"> Increase resilience to the impacts of climate change both at present and in the future (such as changes to water availability, extremes of weather and flooding).



3.0 BASELINE ENVIRONMENT

The SEA Regulations require the environmental report to include:

The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme.

(SEA Regulations (2004), Schedule 2, paragraph 2).

The environmental characteristics of areas likely to be significantly affected.

(SEA Regulations (2004), Schedule 2, paragraph 3).

Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Council Directive 79/409/EEC on the conservation of wild birds and the Habitats Directive.

(SEA Regulations (2004), Schedule 2, paragraph 4).

3.1 BASELINE CONTEXT

An important element of SEA is to identify the current environmental baseline both to identify existing issues and opportunities, and to inform the assessment of potential impacts of the DWMP24. Data informing the baseline has been predominantly sourced from publicly available national datasets and much is associated with the plans, policies, and objectives listed within **Appendix B**, as set out in **Section 2**.

SEA also requires consideration of the likely future baseline in the absence of the DWMP24. This has been considered through review of the publicly available information (such as climate change projections) and consideration of the underlying trends and the likely effects of other plans and projects. Often it is based on professional judgement.

The Baseline Environment Review are presented in **Appendix C** and organised into SEA topics, as set out below. The SEA topics have been selected and organised by considering SEA guidance and the context of the region and the plan being assessed. The future baseline is presented at the end of each SEA topic. The baseline review has been updated in light of feedback received through consultation. The baseline information provides an evidence base on which environmental issues or opportunities resulting from the DWMPs can be predicted and assessed.

The topics have evolved through the process of assessment and consultation, since the Scoping Report, published in early 2022 (see **Section 5.1** for the reasons for these changes).

The SEA topics are:



- Biodiversity and Geodiversity;
- Human Health;
- Socio-economic;
- Carbon & Material Assets;
- Water Resources;
- Flood Risk;
- Heritage;
- Landscape; and
- Climate Change Resilience.

Section 3.2 sets out issues and opportunities for the DWMP24 from the relevant information collected and analysed. This allows YW to analyse where the DWMP24 could prioritise, and where sensitive sites could be most affected by the proposals set out in the DWMP24.

3.2 KEY ISSUES AND OPPORTUNITIES

The key issues and opportunities identified through the baseline environment review and of relevance to the DWMP24 are identified in **Table 3.2.1**. Crossover is inherent across some SEA topics, for example resilience to flood risk resulting from climate change. These occurrences have been outlined where applicable.

Issues and opportunities are broad and therefore not aligned to a particular option, such as installing SuDS or a flow transfer. Rather the issues and opportunities are aligned to the scope of the SEA within the context of drainage and wastewater, and ultimately the DWMP24. This allows us to consider all options, including innovative solutions.



Table 3.2.1 – Issues and Opportunities Summary Table

SEA Topic	Issues	Opportunities
<p>Biodiversity and Geo-diversity</p>	<ul style="list-style-type: none"> • Loss or fragmentation of ecological habitats. • Loss or fragmentation of habitats leads to the loss or reduction in species biodiversity. • Poor drainage services and wastewater pollution could affect aquatic, marine, and terrestrial ecology. This could further impact food chains and natural capital. • Spread of Invasive Non-Native Species (INNS). • Reduced access for people to utilise or visit important habitats with human health, well-being, social education, and recreation consequences. • Loss or degradation of soils and/ or increased soil erosion. • High rates of coastal erosion, • Loss or degradation of good quality agricultural land. • Negative impacts on drinking water sources, including groundwater sources. • Poor soil quality can increase surface runoff with flood risk and erosional impacts. • Contamination risks from operation/ construction. • Intrusion into historical or current landfill sites. • Ever-evolving farming practices such as increased automation may negatively impact soil quality. 	<ul style="list-style-type: none"> • Reduce loss of biodiversity, support recovery, and reduce fragmentation. • Support objectives for BNG where required and seek to achieve it possible in other instances. • Incorporate a natural capital approach to grow the area’s natural capital. • Use soft engineering techniques for solutions where possible that can improve or create new habitats and/ or sequester carbon. • Support the removal of INNS where future planned options interact with them. • Connect people to nature by improving access to green spaces. • Catchment based land use management, including drainage, can improve soil structure and prevent/ reduce soil erosion at the landscape scale, with subsequent benefits for flood risk, carbon storage and biodiversity. • Ensure soils are protected from contamination, such as during construction and flood events. • Reduce soil erosion, particularly from construction activity when effects on soil can quickly become permanent. • Reduce nutrient loads in surface water and groundwater (such as through catchment management) • Protect better quality agricultural land from disturbance. • Promote sustainable farming principles, • Commit to avoiding peat in schemes and follow recommendations in the good soils guide.
<p>Human Health</p>	<ul style="list-style-type: none"> • Increased population and associated development will generate additional demand for wastewater and drainage services. • Construction activities can impact health/ amenity for communities. • Some specific options may impact amenity in negative ways such as odour or dust. • If Public Rights of Way (PRoW) or other access routes are impacted, this could reduce access to green spaces and exercise opportunities. • Poor drainage impacts environmental receptors such as water bodies which can impact human health through consumption 	<ul style="list-style-type: none"> • Provide a resilient plan for sustainable drainage and wastewater management for customers, one that can handle current and future demand. • Ensure construction activities mitigate/ reduce disturbance to local communities. • Enhance the natural environment for recreation purposes to improve wellbeing. • Green infrastructure can help to reduce the urban heat island effect. • Reduce the quantity and/ or frequency of discharge events during storms with benefits to natural capital and bathing areas.



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

SEA Topic	Issues	Opportunities
	<p>(e.g., shellfish consumption), or recreation (e.g., bathing waters).</p> <ul style="list-style-type: none"> • Climate change and hotter summers expected to increase heatwave risk to elderly, especially with an ageing population 	
Socio-economic	<ul style="list-style-type: none"> • Uncertainty over inflation and the rising cost of living may impact the region for the considerable future. This may impact different sectors disproportionately. • Deprivation is high in parts of the region; within urban areas this is often accompanied by lack of access to green spaces. • Construction work resulting from the implementation of the DWMP has the potential to cause temporary disruption and disturbance to services. 	<ul style="list-style-type: none"> • Recent increased levels of working from home has stimulated certain sectors; other opportunities exist through the nationally promoted green recovery. • Economic prosperity and employment opportunities/ stability are likely to be more secure when improving the scale, quality, and resilience of the drainage and wastewater network. • Poor drainage can impact important infrastructure such as transport, especially through flooding. A more resilient network will assist regional connectivity.
Carbon & Material Assets	<ul style="list-style-type: none"> • New built infrastructure is highly likely to generate GhG emissions from embodied carbon, usually contributing negatively towards carbon neutrality objectives. • During operation, some built infrastructure may be carbon/material intensive, such as through significant power and/ or transport requirements. • Siting new wastewater infrastructure can be difficult because of perceptions and local objection. • Globally, resource use is more competitive than ever with increasing prices and dwindling resources available. • Some current wastewater assets are carbon intensive in their operation. • Increased demand from growth in population or the economy is likely to increase overall energy use across the network and the overall waste generation. • Landfills are becoming more difficult to source and more expensive. • Assets can be vulnerable to extreme weather events and from excessive heat. • Air quality is poor in 65 areas across the region, suggesting high sensitivity to any increase in emission of pollutants to the atmosphere. Local plans aim to reduce air pollution, particularly from industry and transport. 	<ul style="list-style-type: none"> • Opportunity to secure measures with lower resource intensity throughout their life cycle such as green rather than grey options. • Opportunity when modifying existing assets to reduce resource use and emissions (such as to air) through use of newer/innovative approaches. • Building, or rebuilding, assets in a more sustainable way can contribute to sustainable resource use, including supporting reduced carbon, and promoting a circular economy. • Opportunities for increased usage of renewable energy and potential for electricity generation from assets such as utilising heat or water flow. • Opportunity to apply the waste hierarchy within design to prevent, reduce, reuse, recycle, recover waste. • Opportunity to reduce emissions to the atmosphere, to aid improved air quality. • Opportunity to consider the whole life GhG emissions and aim to achieve carbon neutrality through construction, embodied carbon, and operation. • Catchment and sustainable drainage based solutions to reduce surface water flows provide the opportunity to reduce the volume of wastewater requiring treatment (reducing infrastructure requirements and associated embodied carbon, along with operational carbon)



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

SEA Topic	Issues	Opportunities
		<ul style="list-style-type: none"> DWMP optioneering should look to promote nature-based solutions, offering the potential to create and restore habitats to sequester carbon dioxide.
Water Resources	<ul style="list-style-type: none"> Population and economic growth will add pressures on the quantity of drainage and wastewater treatment. Pollution can affect water quality with subsequent effects to biodiversity, the food chain (such as shellfish) and human health through potable water supplies and recreation (such as swimming). Contamination can occur, or areas previously contaminated can be subject to increased levels. WFD may fail criteria on achieving Good Ecological Status/ Potential. Drought conditions can negatively impact surface water flows and quality, as well as the treatment of wastewater by limiting water. Increased risks for local sensitive environments, such as chalk streams and Ilkley river bathing site. Sewer leakage can increase nitrate loading, which is especially problematic near/ at drinking water sources. Ongoing risks from unsewered areas to public drinking water sources in source protection zones/ safeguard zones. 	<ul style="list-style-type: none"> Provide a resilient plan for sustainable drainage and wastewater management for customers, one that can handle current and future demand. Promote lower water consumption schemes which will reduce the amount of wastewater needing to be treated. Ensure the sustainable use of all receiving waterbodies. Avoid and control water contamination. Allow more water to remain in the natural environment. Improve water quality in all waterbodies to meet WFD targets and designated site targets (for water quality and flow), as outlined in SSSI Definitions of Favourable Conservation Status. Consider Common Standards Monitoring Guidelines for key freshwater SSSIs and their water quality targets. These can be found via the Designated Sites View System Site Search (naturalengland.org.uk) Ensure nitrate safeguard zones are not negatively impacted. Early integration of climate change resilience measures will have long term benefits to customers and stakeholders. As the DWMP would help address drainage issues, there is potential to reduce the construction of deep soakaways by others in certain zones where there is limited sewer capacity and low permeability glacial drift is present.
Flood Risk	<ul style="list-style-type: none"> Flood risk, including internal and external sewer flooding. Existing infrastructure may be entering the later stages of its lifetime; it may have been designed to accommodate lower capacity when population levels were lower; it may have been designed when climate change impacts were not considered; or designed when soft engineering techniques were infrequently used. Many assets are located close to water bodies, and this ultimately places them at greater flood risk which is anticipated to be intensified by climate change. 	<ul style="list-style-type: none"> Reduce flood risk from all sources. Work with partners such as the Environment Agency to reduce overall flood risk for communities. Increase infrastructure resilience to flooding including climate change. Encourage soft engineering techniques to sustainably manage wastewater where possible.



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

SEA Topic	Issues	Opportunities
Heritage	<ul style="list-style-type: none"> • Potential impacts on designated and non-designated heritage assets (including built heritage and its setting, archaeological remains and its settings and the historic landscape character), particularly where these are related to the water environment or may be affected by drainage arrangements, flood risk (including occasional flooding) and changes to water catchment areas. • There is potential for disturbance of known and unknown heritage assets as well as their setting, especially during construction. • Organic-rich deposits, both archaeological and 'natural' (alluvium, peat, etc.), can include organic artefacts (wood, leather, etc.) and paleoenvironmental indicators / proxies (macroscopic plant remains, pollen, etc.), generally resulting from waterlogged anoxic conditions, which are particularly sensitive to any hydrological and geochemical changes to their burial environments. • The potential impact of water catchment and abstraction measures on heritage assets and their settings, including impacts on water-related or water dependent heritage assets. • The potential impact of changes in groundwater flows and chemistry on preserved organic and paleoenvironmental remains: where ground water levels are lowered as a result of measures to reduce flood risk, this may result in the possible degradation of remains through de-watering, whilst increasing groundwater levels and the effects of re-wetting/ changes in salinity brought about by coastline modification could also be harmful. • The potential impact of hydro-morphological adaptations on heritage assets: this can include the modification / removal of historic in-channel structures, such as weirs / coastal and estuarine features such as historic sea defenses; as well as physical changes to rivers / the coastline with the potential to impact on archaeological and paleoenvironmental remains. • The potential for unrecorded deeply buried and waterlogged archaeology within the 'natural' floodplain / estuarine / coastal deposit sequence. 	<ul style="list-style-type: none"> • Assess, and avoid, minimise and/or mitigate as appropriate, any impacts to heritage assets. • Incorporate improved access to heritage assets where possible, especially for communities where this is previously limited or those who are deprived. • Opportunities exist to discover and preserve archaeological assets which may be previously unknown. • The opportunities for conserving and enhancing heritage assets as part of an integrated approach to flood risk management and catchment-based initiatives, this includes sustaining and enhancing the local character and distinctiveness of historic townscapes and landscapes; • The opportunity for increasing public awareness and understanding of appropriate responses for heritage assets in dealing with the effects of flooding as well as the design of measures for managing flood risk and improving resilience • The opportunities for improving access, understanding or enjoyment of the historic environment and heritage assets as part of the design and implementation of flood risk management measures



SEA Topic	Issues	Opportunities
	<ul style="list-style-type: none"> The potential implications of flood risk on securing a sustainable use for heritage assets, including their repair and maintenance. Many wastewater options are intrusive into the ground in a region with strong archaeological heritage. Hadrian’s Wall World Heritage Site (WHS) and close proximity designations, plus buffers, cover a large area in the North East which will constrain some option locations. 	
Landscape	<ul style="list-style-type: none"> The area is rich in designated landscapes which could be affected by the plan. Some option types could affect visual amenity. Construction can directly impact landscape character and visual amenity. Some landowners in the region (predominantly upland areas) control large areas such as whole stream catchments which may present difficulties if they are opposed. Townscape, heritage, and visual amenity within high value urban areas may constrain options. 	<ul style="list-style-type: none"> Excellent opportunity to develop catchment based sustainable solutions that add to designated areas like National Parks. Protect and enhance the diverse landscape character across the region. Opportunity to redevelop assets with current landscape impacts. Promote sustainable land use. Opportunities to work with large landowners to implement catchment driven solutions. Nature-based flood prevention measures such as appropriate vegetation planting have the potential to enhance the landscape.
Climate Change Resilience	<ul style="list-style-type: none"> Climate change is anticipated to increase extremes of weather and thus the frequency and severity of flood risk. Climate change is anticipated to increase extremes of weather with implications for biodiversity, such as through low flows within watercourses and habitat fragmentation. Those least able to adapt to climate change are likely to be more sensitive to the effects, this could increase socio-economic inequalities. 	<ul style="list-style-type: none"> Options that are resilient to climate change are likely to have wider ranging benefits across almost all other SEA topics from biodiversity to flood risk, and human health. Increased resilience to extreme weather and extreme flows can have significant positive effects on human exposure to pollutants and sewer flooding; and environmental pollution/ quality. Improve place making and resilience to climate change to reduce socio-economic inequality and level up disadvantaged areas. DWMP optioneering should look to promote nature-based solutions, offering the potential to increase resilience to climate change (such as through habitat connectivity and reduce urban heat island effect)

3.3 SPATIAL BASELINE CONTEXT

The Yorkshire region is a diverse mixture of landscapes, topography and geography including small rural villages and large urban and industrial conurbations.



Across this large region, there are a range of climates, from wet and windy moors high in the Dales to flat lowland coastal plains. Water, wool, and coal have all played an important role in driving where and how settlements have developed, with many of Yorkshire’s towns and cities built on rivers which have been straightened, diverted, or canalised to harness power for mills.

The Level 2 SPAs were first introduced in **Section 1** and **Figure 1.2.1**, the Study Area. These Level 2 areas provide a more formalised way to engage with stakeholders and customers alongside facilitating a more strategic level of planning above the more detailed catchment (Level 3) assessments. A brief, high level summary of each SPA is provided in **Table 3.3.1**.

Table 3.3.1 – Summary of each Level 2 SPA

Level 2 SPA	Key characteristics
Calder	Mix of urban and rural with more rural density westwards and more urban density in central and eastern areas. Big towns like Wakefield and Halifax with a history of industry across the catchment.
Colne & Holme Valleys	A steep Level 2 SPA with the Peak District National Park covering approximately 25% of the total area. The area to the west is rural and to the east is quite urban around Huddersfield and surrounding towns with a strong industrial history.
Dearne	The Peak District National Park covers less than 25% of the total area. The area to the west is rural and to the east in quite urban around Barnsley and surrounding towns.
Derwent & Rye	A large Level 2 SPA running north to south east of the coastal region. The area is rural in nature with good quality arable land. A mix of flat areas (within the context of Yorkshire) and undulating areas. The far north is quite steep where the North York Moors National Park intersects, covering between 10-25% of the Level 2 SPA area.
Esk & Coast	Over 75% within the North York Moors National Park and farmland (mix of pastoral and arable). Rural catchment with some small coastal towns like Scarborough.
Holderness Coast	Rural in nature, with areas to the south and east being flat with the Yorkshire Wolds being towards the west and north. Good quality arable land across most of the area with some small coastal towns like Bridlington and Hornsea
Hull	High urban density, some farmland/ rural areas surrounding Hull included. Flat topography.
Leeds	High urban density, rural areas/ greenbelt surrounding Leeds included, with an undulating topography.
Lower Aire	Mix of small towns (coal history of many) and rural areas of good farmland. The area has a flat topography.
Lower Dales	Mostly rural, towns more frequent in central, southern, and eastern areas. Steeper topography in the north west becoming gradually flatter east. Mostly pastoral farming in the uplands, and approximately 25% of the area is in the Yorkshire Dales National Park.



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

Level 2 SPA	Key characteristics
Lower Don	Mix of small town sized settlements (coal history of many) and rural areas of good quality farmland. The area has a flat topography and becomes more undulating towards the west and south-west.
Lower Ouse	Mostly rural and flat with areas of good quality agricultural land. Most of the Level 2 SPA has a history of flooding, with high quality farmland resulting from this.
Rother & Doe Lea	Mixture of urban and rural. Peak District National Park covers less than 10% in the west and the steeper topography is found in the west, becoming better described as undulating towards the east. Towns such as Chesterfield and Bolsover are located here.
Sheffield	Urban, particularly in the east, Peak District National Park covers about 25% in the west, steeper topography in the west, becoming better described as undulating towards the east.
Upper Aire	Mix of rural and urban with the city of Bradford in the far east, and steeper topography in the west. Topography becoming better described as undulating eastwards. Yorkshire Dales National Park covers about 25% in the west.
Upper Dales	Rural catchment with higher quality farmland in a south easterly direction. Two National Parks intersect (Yorkshire Dales and North York Moors) and make up over 25% of the Level 2 SPA area. Steeper topography in the north west, becoming more undulating in the south-easterly direction.
York	Mix of urban and rural with the city of York in the centre. York is flat and areas around are good quality agricultural land. Most of the Level 2 SPA has a history of flooding, with high quality farmland resulting from this.



4.0 SEA ASSESSMENT METHODOLOGY

4.1 SEA OBJECTIVES AND FRAMEWORK

As proposed in the Scoping Report, this SEA adopts an objective-led approach, in line with the ODPM Practical Guide to the SEA Directive^{Error! Bookmark not defined.}. The purpose of the SEA objectives is to:

- State the direction and priorities of the SEA
- Give a structure to assess the DWMP against, ensuring a comprehensive and robust appraisal
- Provide the basis for the identification of relevant indicators

The scope of the objectives has been carefully considered to reflect:

- the SEA Regulations
- Water UK framework on undertaking a DWMP24
- regional information
- the context of drainage and wastewater
- key policy messages and environmental protection objectives identified in the review of policies, other plans, and programmes
- environmental baseline conditions and their likely evolution

The nine SEA objectives are set out in **Table 4.1.1**. Use of these objectives in the assessment of the DWMP is supported by guiding questions (**Table 4.1.2**).

When working through the assessment following the scoping stage, the geodiversity SEA objective was found to fit well as part of the biodiversity SEA objective, and it was not adding value to score it individually in the topic of soils and land use. The climate change objective was also edited so that resilience to climate change could be assessed separately to the causes of climate change, which are now clearly included within the material asset's objective. As such, the final SEA objectives are as follows:



Table 4.1.1 – SEA Topics and SEA Objectives

SEA Topic	Overarching SEA objectives
Biodiversity and Geodiversity	Protect, conserve, restore and enhance biodiversity and geodiversity, including soils
Human Health	Protect, conserve, and enhance human health and well-being, including resilient communities
Socio-economic	Protect, conserve, and enhance social and economic prosperity
Carbon & Material Assets	Address the causes of climate change and manage and improve efficient use of resources, including embodied carbon, carbon emissions, emissions to air and waste generation
Water Resources	Protect, conserve, and enhance water resources
Flood Risk	Reduce and manage flood risk, increasing flood resilience
Heritage	Protect, conserve, and enhance the historic environment, including archaeology
Landscape	Conserve, protect and enhance the landscape, townscape, and visual amenity
Climate Change Resilience	Adapt, and improve resilience to climate change

Table 4.1.2 – SEA Objectives and their guiding questions

SEA Topic	Overarching SEA objectives	Guiding Questions
Biodiversity and Geo-diversity	Protect, conserve, and enhance biodiversity and geodiversity, including soils	<p>Will it affect the conservation status of any internationally designated sites (Special Protection Areas, Special Areas of Conservation (SACs), Ramsar sites)?</p> <p>Will it affect the conservation status of any nationally designated sites (Sites of Special Scientific Interest (SSSIs)?</p> <p>Will it affect the conservation status of any other designated sites (local wildlife sites)?</p> <p>Will it contribute to biodiversity loss/ gain?</p> <p>Will it affect habitat connectivity/ fragmentation?</p> <p>Will it affect the freshwater or coastal environment, habitats, and species?</p> <p>Will it affect irreplaceable habitat such as ancient woodland?</p> <p>Will it affect the introduction or spread of INNS?</p> <p>Will it affect natural capital and ecosystem services?</p> <p>Will it avoid damage to geologically important sites (e.g., geological SSSIs)?</p> <p>Will it protect and enhance the quality of soils?</p> <p>Will it protect, conserve, and enhance resources, such as high-quality agricultural land, sterilisation of mineral resources, soil erosion and nutrient loading of waterbodies?</p> <p>Will it promote the sustainable use of land, such as using previously developed land?</p> <p>Will it create contamination or contribute to remediation?</p> <p>Will it affect access to nature, particularly for those living within urban or deprived areas?</p>



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

SEA Topic	Overarching SEA objectives	Guiding Questions
		Will it achieve legislative & policy targets for biodiversity protection & enhancement?
Human Health	Protect, conserve, and enhance human health and well-being, including resilient communities	<p>Will it affect access to nature, particularly for those living within urban or deprived areas?</p> <p>Will it affect the environment for other users including for recreation, tourism and navigation?</p> <p>Will it affect human health and well-being through access to resilient, high quality, sustainable and affordable wastewater systems?</p> <p>Will it affect human health and well-being through access to a resilient, high quality, sustainable and affordable supply of water?</p> <p>Will it address specific customer concerns?</p>
Socio-economic	Protect, conserve, and enhance social and economic prosperity	<p>Will it affect opportunities for recreation and tourist activities?</p> <p>Will it affect economic development/ prosperity?</p> <p>Will it affect social deprivation and inequality?</p> <p>Will it affect important infrastructure (such as hospitals, roads, rail)?</p>
Carbon & Material Assets	Address the causes of climate change and manage and improve efficient use of resources, including embodied carbon, carbon emissions, emissions to air and waste generation	<p>Will it contribute towards net zero targets?</p> <p>Will it use natural rather than built solutions where appropriate?</p> <p>Will it make efficient use of existing infrastructure?</p> <p>Will it minimise the demand for resources during construction (such as through the use of soft engineering solutions rather than hard engineering solutions)?</p> <p>Will it minimise the demand for resources during operation (such as through avoiding pumping requirements)?</p> <p>Will it affect emissions of pollutants to air, including in sensitive locations (e.g., in proximity to an AQMA/ an ecologically sensitive site)?</p> <p>Will it affect waste generation, including hazardous wastes?</p>
Water Resources	Protect, conserve, and enhance water resources	<p>Will it enable better management of surface water before entering sewers?</p> <p>Will it affect coastal water quality (including bathing waters, shellfish waters)?</p> <p>Will it affect surface water quality or quantity?</p> <p>Will it affect groundwater quality or groundwater recharge?</p> <p>Will it affect drinking water or water abstraction zones?</p> <p>Will it contribute to or conflict with the achievement of WFD objectives (e.g., Good Ecological Status)?</p> <p>Will it affect contaminants entering the receiving environment?</p> <p>Will it reduce the volume and frequency of SOs?</p> <p>Will it achieve legislative & policy targets for water resources protection & enhancement?</p>
Flood Risk	Reduce and manage flood risk, increasing flood resilience	<p>Will it promote catchment-based, and Sustainable Drainage Systems (SuDS) based solutions?</p> <p>Will it affect the resilience of water and wastewater systems?</p> <p>Will it affect flood risk elsewhere?</p> <p>Will it affect sewer flooding events?</p> <p>Will it be vulnerable to flood risk itself?</p>
Heritage	Protect, conserve, and enhance the historic environment, including archaeology	<p>Will it affect archaeology, including unknown archaeology?</p> <p>Will it affect an historic designation/ feature?</p> <p>Will it affect the setting, the buffer, or significance of a historic designation/ feature?</p> <p>Will it affect access to important heritage assets within the region?</p>
Landscape	Conserve, protect and enhance the	Will it affect designated landscapes and features, including National Parks and Areas of Outstanding National Beauty (AONBs)?



SEA Topic	Overarching SEA objectives	Guiding Questions
	landscape, townscape, and visual amenity	Will it affect landscape character, including tranquillity and visual impact? Will it affect the townscape? Will it affect the seascape?
Climate Change Resilience	Adapt, and improve resilience to climate change	Will it help to restore the natural ecosystem function and promote resilience to climate change? Will it affect the environmental resilience of the water environment to climate change, flood risk and drought? Will it affect vulnerability to risks associated with climate change effects (e.g., reduce the adverse effects of droughts and floods, reduce the heat island effect)? Is it vulnerable to climate change?

4.2 SEA ASSESSMENT METHODOLOGY

The DWMP24 has been assessed using the SEA objectives and guiding questions above. The assessment considers if the plan, the components of the plan, and their reasonable alternatives are likely to bring positive, negative, neutral, or uncertain effects in relation to the SEA objectives. Consideration is given to the likely significance of identified effects in accordance with Schedule I to the SEA Regulations, listed below.

Criteria for determining the Likely Significance of Effects on the Environment (SEA Regulations, Schedule 1)

- 1) The characteristics of plans and programmes, having regard, in particular, to:
 - a) the degree to which the plan or programme sets a framework for projects and other activities, either with regard to the location, nature, size and operating conditions or by allocating resources;
 - b) the degree to which the plan or programme influences other plans and programmes including those in a hierarchy;
 - c) the relevance of the plan or programme for the integration of environmental considerations in particular with a view to promoting sustainable development;
 - d) environmental problems relevant to the plan or programme; and
 - e) the relevance of the plan or programme for the implementation of Community legislation on the environment (for example, plans and programmes linked to waste management or water protection).

- 2) Characteristics of the effects and of the area likely to be affected, having regard, in particular to:
 - a) the probability, duration, frequency and reversibility of the effects;
 - b) the cumulative nature of the effects;
 - c) the transboundary nature of the effects;
 - d) the risks to human health or the environment (for example, due to accidents);
 - e) the magnitude and spatial extent of the effects (geographical area and size of the population likely to be affected);
 - f) the value and vulnerability of the area likely to be affected due to — i) special natural characteristics or cultural heritage; ii) exceeded environmental quality standards or limit values; or iii) intensive land-use; and
 - g) the effects on areas or landscapes which have a recognised national, Community or international protection status.



The SEA process is concerned with likely significant effects, including the measures envisaged to prevent, reduce, and as fully as possible offset any significant adverse effects of implementing the plan. For the purposes of this appraisal, a significant negative assessment (indicated by a 'red' score within the appraisal matrix) is considered to be a significant adverse effect; where the option is implemented by the plan, measures will be required to prevent, reduce, and offset the significant adverse effects.

The following terms are used in the appraisal:

- **Likely future without the plan:** if the plan is not adopted, the likely future based on the effects of other expected plans, projects, and underlying trends.
- **Secondary or indirect effects:** effects that are not the direct result of the plan but occur away from the original effect or as a result of a complex pathway.
- **Cumulative effects:** for instance, where several options each have insignificant effects but together have a significant effect; or where more than one policy in the plan has a combined effect.
- **Synergistic effects:** individual effects interact to produce a total effect greater than (or less than) the sum of their total effects.
- **Total effects of the plan:** the combined effects of all the policies within the plan.
- **Cumulative effects of the plan:** the total effects of the plan together with the likely future without the plan.
- **Cross border effects:** effects outside of the area.
- **Temporary effects:** effects that are not permanent, such as occur during construction. These may be short- to longer-term temporary effects.
- **Short term** (0-5 years, i.e., the next AMP cycle), **medium term** (up to 2050), **long term** (beyond 2050).
- **Certainty:** the level of surety of an effect.

The above types of effects have been considered when conducting the assessment and where relevant they are referenced in this report.

It is important to note that the assessment has been undertaken at the strategic level, in line with the nature of SEA and the DWMP24. There will naturally be variation in the effects of the plan across the plan area as the receiving environment and the implementation of options vary.



4.3 HOW ARE LEVEL 2 SPAS TO BE ASSESSED?

The Water UK framework recommends undertaking SEA on the final Plan, which is for Level 1, the highest and most strategic level of the DWMP24. However, a requirement of the Water UK framework is also to undertake the development of options with an understanding of the environmental and social impacts, supported by SEA requirements.

Undertaking SEA of the final plan was deemed unlikely to be effective in influencing the plan, development of options, and its environmental effects, as such the SEA was carried out during the development of the plan.

To keep the assessment manageable and informative, the assessment of options has been kept relatively strategic within the SEA, and as such each Level 2 SPA was judged appropriate for assessment. As there were 17 Level 2 SPAs, this was judged to be a good number for a meaningful assessment. The alternative would be to apply options to each of 600+ Level 3 catchments that passed through risk analysis (Level 3), or to have grouped these Level 3 catchments into categories based on criteria such as urbanisation and land use. However, this would be too broad and result in an overly detailed assessment (so not appropriately 'strategic') and would be unmanageable.



5.0 DEVELOPMENT AND ASSESSMENT OF INDIVIDUAL OPTIONS

5.1 DWMP24 PROCESS AND COMPATIBILITY WITH THE SEA

The DWMP24 has been produced following a risk and benefits-based approach, following the guidance provided in the DWMP24 Framework set out in **Section 1**. This process is expanded upon in **Table 5.1.1** below, including setting out the factors considered in the development of the DWMP24.

Table 5.1.1 – DWMP24 Framework Process

DWMP24 Stage	Overview
Risk Based Catchment Screening (RBCS)	<p>High level risk-based assessment of all Level 3 catchments within the YW region against 17 indicators to establish potential levels of risk, both now and in the future. Those catchments identified as carrying higher levels of risk proceed to the more detailed Baseline Risk and Vulnerability Assessment (BRAVA). The indicators included:</p> <ul style="list-style-type: none"> • Bathing or Shellfish Waters (SOs discharging to Bathing Waters or Shellfish Waters) • Continuous or intermittent discharges to sensitive waters (Part A) • Storm Overflow Assessment Framework (SOAF) (those overflows previously triggered based on spill frequency and included in the WINEP programme for PR19) • Capacity Assessment Framework (CAF) (the overall capacity of each L3) • Internal Sewer Flooding • External Sewer Flooding • Pollution incidents • WwTW Quality Compliance • WwTW Dry Weather Flow (DWF) Compliance • Storm Overflows (breach of Environment Agency permit) • Risk from interdependencies with other sources of flooding • Planned residential development • Sewer collapse • Sewer blockages
Baseline Risk and Vulnerability Assessment (BRAVA)	<p>Hydraulic modelling and desk top studies to quantify changing risks over time from climate change and population growth. The assessment considers historic performance data such as flooding incidents.</p>
Problem Characterisation	<p>The risks ('problems') identified by BRAVA are characterised to assess the scale of the risk and the impact it may have to determine the level of optioneering needed.</p>
Option Development and Appraisal (ODA)	<p>Exploration of the available options and solutions to mitigate the risks using YW's Decision Making Framework analytical tool (the 'optimiser tool'). The assessment identifies options to achieve the outcomes identified within Scenarios 1 to 4 (see Section 1.2) through consideration of: CAPEX costs, OPEX costs, length of river where water quality would improve (both in terms of ecology and bathing), area from which surface water would be intercepted or separated from combined sewer, internal flooding incidents, external flooding incidents, SO spill frequency and volume, area of</p>



DWMP24 Stage	Overview
	green space restored or protected, overflow pump run time, operation carbon, embodied carbon, and total storage volume.
Programme Appraisal	Select options for delivery based on the preferred (or least cost) and prioritise the interventions, balancing the impact of cost to customers and the natural capital approaches.

The DWMP24 process itself provides a good coverage of the SEA topics, particularly in relation to water resources, flood risk, carbon, climate resilience and biodiversity – reflecting the nature of the plan and its objectives for the (water) environment, flood risk and wastewater compliance and the wider Six Capitals approach. The assessment shows less consideration of the historic environment and landscape than other SEA topics, again reflecting the nature of the plan. These topics are however considered through the SEA and will be subject to the usual development management controls as the plan is implemented hence this is not considered to be an issue. Overall, the SEA topics are well covered within the DWMP24 development process, demonstrating integrated consideration of the SEA themes throughout the plan production.

5.2 OPTION DEVELOPMENT AND CONSIDERATION OF REASONABLE ALTERNATIVES

When developing the draft DWMP, Yorkshire Water identified generic options to address storm overflows for consideration in line with the Water UK Framework. As set out in Section 5.2 of the SEA Environmental Report of the Draft DWMP, these options were reviewed by the SEA team to ensure all reasonable alternatives were being considered (listed for completeness below). **Figure 5.2.1** below shows the DWMP hierarchy of approach to risk.



Figure 5.2.1 DWMP hierarchy of approach to risk

DWMP Risk Management Hierarchy		
1	Monitor	Monitor performance.
2	Investigate	Gather additional data and/or information to improve understanding of risk and support development of cost beneficial interventions, if required.
3	Optimise (operate and invigorate)	Operate and maintain systems to maximise existing capacity and minimise risk. Domestic and business customer education.
4	Reduce or remove	The management and control of rainfall induced flows to reduce the quantity of flow within the wastewater system. Where appropriate schemes should be developed (and funded) in Partnership with stakeholders to develop mutually beneficial solutions.
		Generic customer side management options to manage the use of water in customer properties (domestic and trade).
		Measures to reduce the contaminant load within the wastewater system.
		Measures to reduce the receptor risk (where other options have been demonstrated to be non cost beneficial).
5	Enhance (fabricate)	Construct new assets using efficient construction approaches to manage flows and loads within the conveyance system or at wastewater treatment works to minimise impacts on customers and the environment.

Subsequently, a more extensive list of options were identified and reviewed within the DWMP24 Option Development and Appraisal stage for storm overflows, as shown in **Table 5.2.1**.



Table 5.2.1 – Unconstrained options considered in the DWMP24 for storm overflows

<i>Built catchment flow reduction</i>	Side stream excess flows through passive systems (e.g. Reedbed to treat flows)	<i>Political engagement</i>
<i>Membrane filtration</i>	Impermeable area surface water management - SuDS	Impermeable area surface water management - Removal at source
<i>Chemical disinfection</i>	<i>Work with other water and sewerage companies (WASCS)</i>	Full surface water separation
<i>Chemical dosing</i>	<i>Accelerated rollout of IOT / SMART monitors</i>	Infiltration reduction
<i>Dilution assessment</i>	<i>Cross sector planning</i>	Customer education (blockages)
Increase treatment capacity	Capture storm water, treat and use as sub-potable	Misconnections
<i>Industry collaboration</i>	<i>Citizen science</i>	Property level surface water management
<i>Trade effluent management</i>	<i>Catchment Nutrient Balancing</i>	Per capita consumption reduction
Nature-Based Solutions – wetlands	<i>Geographical synergies</i>	<i>SMART Water Networks</i>
Network storage	<i>Innovative treatment process</i>	<i>System Operator</i>
<i>Permit trading</i>	Catchment Partnership support	
Rationalise assets	<i>Payment for ecosystem services</i>	

Within this unconstrained list of options, those identified in italics were screened from further assessment because they did not deliver the SODRP outcomes, or in the case of innovative treatment processes, no suitable processes were identified. The SEA queried the removal of the following options which would appear to be more sustainable, which were screened out for the following reasons:

- SMART monitors and SMART water networks – it was evident in the Capacity Assessment Framework, completed for Water UK, there is limited capacity within Yorkshire Water’s existing combined sewerage networks, where a significant number of sewers are predicted to spill on 1-year return period events. Based on this, and considering the DWMP is a strategic assessment, it was concluded that SMART networks and the associated SMART monitoring, would be of limited benefit at a strategic level. To further test this finding, Yorkshire Water are undertaking a number of SMART network innovation studies this AMP. From the results of these, they will be able to assess the benefits and consider if they should be used in future AMPs. They consider that there are benefits in the SMART monitoring for managing other causes flooding and pollution, but not to make significant changes to the available hydraulic capacity within our networks. The SMART projects are also looking at improving the mapping of the networks and capturing data to improve the corporate asset databases. The majority of our networks are dendritic (branching like a tree) in their nature, limiting opportunities to operate them differently in times of rainfall.



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

- Side stream passive treatment of excessive flows – the treatment of SO discharges was discounted as currently it is not an approved technique with the Environment Agency. Yorkshire Water are working hard to influence their views on this and have set up a working trial site. These types of solution, a reedbed style system, would currently bring in the treatment works regulations, which is considered excessive given the purpose of the wetland. Yorkshire Water are working with other WASCs in challenging the current approaches, but at the time of developing the solutions for the DWMP this was not considered a viable option.

Other potential alternative options suggested by the SEA team at the draft plan stage, and discounted were:

- Disinfection (such as ultraviolet radiation) of SO discharges to reduce harmful pathogens to bathing waters, as suggested within the headline target of the SODRP consultation. The focus has instead been reducing the frequency of SO discharges. Disinfection is energy intensive, has a high capital cost and requires a large area of land. Further consideration may be given to disinfection within later DWMP cycles as technologies improve and full understanding of this method of reducing local ecological harm from storm overflows is developed.
- Catchment management in relation to nutrient load is beyond the scope for the first DWMP24 as it is typically considered by water companies in relation to drinking water quality. However, this issue has increased in profile recently in relation to the need to demonstrate 'nutrient neutrality' within plans and projects to demonstrate there is no net increase in nutrients so that they do not add to existing nutrient burdens at certain sites. Applications for land uses which might impact upon the wastewater system are affected, including applications for new homes. At this stage this is considered outside of the scope of the DWMP24, however this situation will need to be kept under review. Consideration will be given to inclusion of this issue within later DWMP cycles. Catchment management in relation to flows is however within the scope.
- Tankering wastewater to WwTW sites. It is deemed unacceptable as a permanent solution due to volumes, carbon and social disruption on local residents.
- Greywater and blackwater treatment and reuse domestically will be addressed through influencing planning policy at this stage and considered further within subsequent DWMP cycles; further understanding is required as to its acceptability to customers.

The constrained list of options taken forward for further consideration are summarised in **Table 5.2.2**. These are the reasonable alternative individual options and are assessed using the SEA framework in **Table 5.3.1** in the next section.

Table 5.2.2 –Constrained options considered in the DWMP24 for storm overflows



Constrained Options for DWMP24	
•	Increase treatment capacity
•	Nature-Based Solutions - Wetlands
•	Network storage
•	Rationalise assets
•	Side stream excess flows through passive systems (e.g. Reedbed to treat flows)
•	Impermeable area surface water management – SuDS
•	Capture storm water, treat and use as sub-potable
•	Catchment Partnership support
•	Impermeable area surface water management – Removal at source
•	Full surface water separation
•	Infiltration reduction
•	Customer education (blockages)
•	Misconnections
•	Property level surface water management
•	Per capita consumption reduction

5.3 SEA ASSESSMENT OF OPTIONS (LEVEL 1)

The unconstrained list of options have been first assessed across the whole Level 1 plan area using the SEA framework (Table 4.1.1 and 4.1.2). Results are presented in Table 5.3.1 below, with further details of the options, assumptions made, and narrative supporting the assessment provided in Table 5.3.2.

KEY:

Major positive	+++	Moderate positive	++	Minor positive	+	Neutral	0
Major negative	---	Moderate negative	--	Minor negative	-	No relationship	



Table 5.3.1 - Assessment of reasonable alternative individual options using SEA framework (applied to the Level 1 DWMP24 area)

Level 1 – Whole Study Area										
Options:	SEA Topic:	Biodiversity and Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
Increase treatment capacity		-	-	-	--	++	++	--	--	+
Nature-Based Solutions - Wetland		+++	++	-	+	++	+++	0	+++	+++
Network Storage		-	0		-	++	++	-	-	+
Rationalise assets		-	0	0	-	++	0	-	0	+
Side stream excess flows through passive systems (e.g Reedbed to treat flows)		++	+	0	+	+++	-		+	+
Impermeable area surface water management - SuDS		+++	++	+	++	+++	+++	0	++	++
Capture stormwater, treat and use as sub-potable		-	0	-	+	++	++	--	--	+
Catchment partnership support		++	++	++	++	++	++	++	++	++
Impermeable area surface water management – Removal at source		-	0		-	+++	-	-	0	+
Full surface water separation		-	0		-	+++	-	-	0	+
Infiltration Reduction			+		+	+	+			+
Customer Education (blockages)		+	0	+	+++	++	++			++
Misconnections		0	0		0	+	+			
Property level surface water management			-	+	-	-	-	0	-	-
Per capita consumption reduction			0	+	+++	++	+			++



Table 5.3.2 – Narrative supporting the assessment of reasonable alternative individual options using SEA framework (generic to the whole DWMP24)

Generic Options from DWMP24	Description and example options	Example of specific options and the assumptions made for assessment
<p>Observe, monitor and investigate options are not included in this table as they will not be assessed through SEA given they were looked at in an earlier stage of the DWMP24 process, with only applicable Level 3 catchments moving forward in the process.</p>		
<p>Increase treatment capacity</p>	<p>Upgrades to existing WwTW to provide additional treatment/storm storage capacity.</p> <p>e.g., increasing storm tank storage provision at a WwTW to maintain/reduce storm discharges to the environment in the future.</p>	<p>The option is based on a new WwTW, or upgrades to an existing WwTW to address population growth. It would also likely be implemented in combination with the WwTW rationalisation and flow transfer options (should they be taken forward).</p> <p>This option is assumed to provide greater efficiency during operation (in terms of energy, chemical use etc.) and to be designed with increased resilience to flood risk from climate change. However, it will be resource intensive during construction.</p> <p>Provision of increased storm tanks at the WwTW would reduce peak flows to allow an increased proportion of sewage to be treated prior to discharge. Similarly, provision of increased treatment capacity would allow an increased proportion of sewage to be treated prior to discharge. Where this option is combined with an increased flow to the works (e.g., due to rationalisation of another works and/or flow transfer), it would result in increased flows to the receiving watercourse. Given the permitting requirements relating to WwTW discharges, and the intent of this option, it is assumed that this would result in improvements to water quality. However further detailed consideration would be required.</p> <p>Similarly, increased flows to a works may increase the subsequent fluvial flood risk in the receiving watercourse – this requires further consideration. Whilst some upgrades may be able to be accommodated within the existing footprint/disturbed ground within a works, others may involve loss of greenfield land, with associated ecological, heritage and landscape impacts. There may be some increase in odour, noise, and visual impact at the works, depending on the local sensitivity and scale of changes.</p> <p>DWMP decision: This option is to be considered across all workstream and during delivery of the DWMP</p>
<p>Nature-Based Solutions - Wetland</p>	<p>Changes to rural land management/drainage to reduce flows passing downstream.</p> <p>e.g., reducing artificial drainage in an upland area.</p>	<p>This option can apply at the strategic level across a catchment/s, including consideration of upstream and downstream catchments. It provides natural flood management by holding back flows in the upstream parts of a catchment through rural land management to increase infiltration and slow overland flows/ river flows impacting the downstream catchment.</p> <p>This option is assessed on the basis that it will be undertaken within rural areas (including those catchments categorised as rural), including upstream of the catchments being investigated. It is a green option and assessed on the basis that it is not resource intensive to</p>



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

Generic Options from DWMP24	Description and example options	Example of specific options and the assumptions made for assessment
		<p>implement. It aims to increase retention of water within upstream catchments, reducing runoff and therefore flood risk directly.</p> <p>The intention of this option is to reduce surface water and river flows to catchments and within catchments, to reduce surface water flows entering the sewer network and subsequently STWs. This reduces SO discharges by allowing an increased proportion of sewage to be treated within the capacity of STWs, thus improving water quality. See note on potential cumulative effect below*.</p> <p>This option potentially provides opportunity to slow the rate of drainage, including of important habitats, contributing to rewilding. It can lead to substantial habitat creation/ restoration/ improvement and is likely to benefit soils (including their carbon storage and sequestration capacity). The application of this option across large areas provides the opportunity to support a natural landscape, supporting natural ecosystem functions. More detailed consideration of the potential for this opportunity in relation to the most important habitats within Special Protection Areas and SACs is being considered within the HRA. Water quality can also be improved by reduced flows and fewer subsequent SO discharge events to watercourses. There is a potential for conflict with land uses, such as farming which could limit use of the option, or potentially have socio-economic effects - case by case consideration is required. It helps to address the causes of climate change (through support of natural rather than built solutions, and soil carbon storage) and promotes resilience to climate change (in terms of supporting biodiversity and managing water flows). This option requires partnership working, such as with landowners and potentially others such as Natural England.</p> <p>DWMP decision: This option is not sufficiently developed to deliver in PR24 (2025-2030)</p>
<p>Network Storage</p>	<p>Retention of flows within engineered storage to hold large volumes of runoff on both combined and surface water networks. Typically located online, or in close proximity to the existing sewer network.</p> <p>e.g., concrete tanks (below ground); or a balancing reservoir (above ground).</p>	<p>This option reduces peak flows through the sewer network, thus reducing the risk of sewer flooding; and reduces peak flows to WwTWs, reducing SO discharges by allowing an increased proportion of sewage to be treated within the capacity of WwTWs, thus improving water quality. However, the increase in the treatment of wastewater, will increase resource use within WwTWs; depending on the scale of this option, this could require the provision of new or expanded WwTWs.</p> <p>This option is assessed on the basis that it is a grey option that will be constructed of concrete/ a similar material and require the operation of pumps during operation to empty the storage after high flow events. Through provision of flow storage, it would provide some resilience to climate change.</p> <p>The construction of storage will be disruptive locally on a temporary short-term basis. It will require careful siting, planning and construction to reduce effects to the environment (such as</p>



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

Generic Options from DWMP24	Description and example options	Example of specific options and the assumptions made for assessment
		<p>biodiversity, heritage, nuisance). Where storage is located online and thus typically within previously disturbed ground, often in the highway, the potential effect on buried archaeology and biodiversity is lower, although the effect is likely to increase when locating storage locally where these issues may have higher sensitivity, such as adjacent to SOs and thus watercourses. From a landscape perspective, it is assumed to be located below ground or well-designed if above ground so that there are no major negative long-term landscape effects. However, this will depend on the reinstatement provided.</p> <p>This option effectively sterilises land from development, however the post-construction reinstatement may be able to provide beneficial uses, such as public access.</p> <p>DWMP decision: This option is taken forward</p>
Rationalise assets	Rationalise asset by pumping flows to a network with available capacity.	<p>This option would pump excess flows from one WwTW catchment to another catchment nearby/adjacent that has available capacity. This option would likely require some capital works to provide the infrastructure to transfer flows (such as pumps and sewer network), with energy used during pumping and additional treatment volume, however would make efficient use of existing WwTW capacity and reduce SO spills.</p> <p>As flows would be within the existing capacity of treatment works, this option is assumed to have positive water quality benefits, and unlikely to effect flood risk for the receiving watercourse.</p> <p>DWMP decision: SMART monitoring techniques pilots are underway but are not ready to deploy within PR24 (2025-2030) but will be considered in future cycles and development of site specific solutions</p>
Side stream excess flows through passive systems (e.g Reedbed to treat flow)	Polish the discharge from WwTW using Reed bed system	<p>This option makes use of reedbeds to provide additional treatment to the discharge from WwTWs.</p> <p>The reedbed option would help to polish the discharge from WwTW. Hence, it would improve the water quality (potentially significantly) and will provide secondary positive permanent benefits for aquatic biodiversity and human health. This may increase the uptake of open water swimming, providing further health and well-being benefits.</p> <p>Typically, this option is not resource intensive to construct, operate or to maintain, providing nature-based solutions. The option can lead to substantial habitat creation /restoration/ improvement and is likely to benefit soils / mudflat (including their carbon storage and sequestration capacity). The application of this option across large areas provides the opportunity to support a natural landscape, supporting natural ecosystem functions and improving resilience to climate change.</p>



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

Generic Options from DWMP24	Description and example options	Example of specific options and the assumptions made for assessment
		<p>This option may reduce the flow and affect the fluvial flooding. The option will be implemented in the riverbank and no excavation is required. There is no particular effect in relation to heritage. It would be no particular effects in relation socio-economics in the long term (beyond the nuisance issues during construction) which assess as neutral against these SEA objectives.</p> <p>DWMP decision: This option is not sufficiently developed to deliver in PR24 (2025-2030) but will be considered in future cycles</p>
<p>Impermeable Surface water management-SuDS</p>	<p>An option aiming to 'hold back' surface water flows, particularly during storm events, for subsequent release via infiltration, to surface water, or to sewer.</p> <p>e.g., SuDS features such as ponds, swales, roof gardens, rain gardens, greening up a city centre thoroughfare with above-ground SuDS features and planting.</p>	<p>This option was assessed on the basis that it would be a multi-functional corridor providing drainage through SuDS to attenuate runoff before it is discharged to surface water, enters the sewer network, or is infiltrated into groundwater. Such features typically also provide access routes and green spaces.</p> <p>Blue/green corridors provide multi-functional spaces offering management of surface water flows along with active travel routes (such as footpaths and cycle paths), typically within a planted setting. In terms of drainage, they slow the flow of, and retain surface water, before its infiltration to the ground, discharge into watercourses or if necessary, sewer; they reduce the total flow and peak flows within the sewer network and to STWs, reducing the frequency and extent of SO discharges, thus offering water quality improvements. The volume of wastewater requiring treatment also reduces.</p> <p>Slowing the rate of drainage promotes natural flood risk reduction and thus climate resilience. However, at the current time, blue/ green corridors provide less certainty of the level of flood risk reduction which can be achieved, when compared to the traditional grey infrastructure options.</p> <p>The multi-functional nature of blue/ green corridors also provides opportunities in terms of human health and well-being, amenity, and biodiversity. In urban areas they help to counter the urban heat island effect, improving resilience to climate change. Typically, they are not resource intensive to construct, operate or to maintain, providing nature-based solutions.</p> <p>This option requires an integrated approach with other land uses and partnership working, such as with landowners, local authorities, and developers and as such requires a longer lead in time.</p> <p>DWMP decision: This option is taken forward</p>



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

Generic Options from DWMP24	Description and example options	Example of specific options and the assumptions made for assessment
<p>Capture stormwater, treat and use as sub-potable</p>	<p>Install systems, at property level or larger scale, to collect stormwater for use</p>	<p>The option is based on the installation of stormwater capture measures for use where water does not need to be treated to potable standards, such as for irrigation. This could vary from small scale measures (such as water butts) to larger measures such as commercial systems within the curtilage of existing commercial property.</p> <p>This option reduces flows through the sewer network, thus reducing the risk of sewer flooding; and reduces flows to WwTWs, reducing SO discharges by allowing an increased proportion of sewage to be treated within the capacity of WwTWs, thus improving water quality. This option provides a source of water, reducing demand to other water resources, further it reduces resource use in the supply of the water which has not been through potable treatment.</p> <p>It is assumed to have neutral human health impacts, with reuse only occurring for suitable uses.</p> <p>This option is assumed to be passive, not requiring energy (such as for pumping) or chemical treatment during operation. Resource use during installation will vary based on the scale of the measures and are assumed not to involve extensive capital works.</p> <p>DWMP decision: This option is not considered viable to deliver in PR24 (2025-2030)</p>
<p>Catchment Partnership Support</p>	<p>Working in partnership with others (such as other LLFA and wider organisations), to implement programmes with multiple benefits beyond those directly relevant to Yorkshire Water.</p> <p>e.g., working in partnership with a highway authority to implement a SuDS scheme which reduces both highway flooding and the spill frequency at storm overflows. Or working with housing authority to separate drainage whilst housing renovations are undertaken.</p>	<p>Whilst this approach would effectively implement other options within the DWMP24 (which are each individually assessed), working in partnership increases the potential to implement options which are multi-functional, providing a wide range of benefits beyond just those relevant to drainage. For example, green infrastructure may be able to provide flood alleviation along with open spaces and active travel routes and biodiversity improvements, which allow efficient use of land, help to combat the urban heat island effect, enhance townscapes, provide health and well-being benefits through access to greenspace, and provide efficiency and accessibility in relation to resource use. The full suite of benefits would be unlikely to be able to be delivered within the scope of a drainage only scheme.</p> <p>Given the potential for wide ranging benefits, this approach appraises positively across all the SEA objectives (noting that there will be some variation depending on the nature of the options implemented in partnership).</p> <p>Typically, partnership working requires a longer lead in time.</p> <p>DWMP decision: This option is to be considered across all workstreams and during delivery of any DWMP schemes</p>



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

Generic Options from DWMP24	Description and example options	Example of specific options and the assumptions made for assessment
<p>Impermeable area surface water management – Removal at source</p>	<p>Separation of surface water flows through engineered solutions to take runoff out of the combined sewer network.</p> <p>e.g., provision of a new surface water sewer network.</p>	<p>This option is assumed to provide new surface water sewer networks to intercept highway runoff that is currently connected to the combined sewerage network and discharge to a watercourse or to ground.</p> <p>This grey option would reduce the total volume of water entering the combined sewer network and requiring treatment by preventing surface water flows entering the combined sewer.</p> <p>This option reduces flows through the combined sewer network, thus reducing the risk of sewer flooding; and reduces flows to WwTWs, substantially reducing SO discharges by allowing an increased proportion of sewage to be treated within the capacity of WwTWs, thus improving water quality.</p> <p>There is a risk that provision of further surface water systems will increase the conveyance rate to receiving watercourses, potentially increasing the subsequent fluvial flood risk. Where this option is prioritised for further investigation, flood risk will be considered further and a such this is noted as a minor negative.</p> <p>The construction of a new surface water sewer system would be disruptive and would require careful routing, planning and construction to reduce adverse effects to the environment (such as to biodiversity, heritage, nuisance), although it is unlikely there would be direct effect on these topics during operation. It would also require a large volume of resources for construction, although it would require few resources during operation and may reduce resource use at STWs where the volume of flow to be treated would be reduced through by the removal of flows.</p> <p>DWMP decision: This option is to be considered across all workstreams and during delivery of any DWMP schemes</p>
<p>Full surface water separation</p>	<p>Separation of all surface water flows from the combined sewer through a combination of measures</p>	<p>This option is to remove all surface water from the combined sewerage system, with flows collected through a combination of ‘grey’ and ‘green’ measures, with flows discharging through infiltration to ground or to watercourses.</p> <p>This green-grey option would reduce the total volume of water entering the combined sewer network and requiring treatment.</p> <p>This option reduces flows through the sewer network, thus reducing the risk of sewer flooding; and reduces flows to WwTWs, substantially reducing SO discharges by allowing an increased proportion of sewage to be treated within the capacity of WwTWs, thus improving water quality.</p>



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

Generic Options from DWMP24	Description and example options	Example of specific options and the assumptions made for assessment
		<p>There is a risk that provision of further surface water systems will increase the conveyance rate to receiving watercourses, potentially increasing the subsequent fluvial flood risk. Where this option is prioritised for further investigation, flood risk will be considered further and a such this is noted as a minor negative.</p> <p>The construction of a new surface water sewer system would be disruptive and would require careful routing, planning and construction to reduce adverse effects to the environment (such as to biodiversity, heritage, nuisance), although it is unlikely there would be direct effect on these topics during operation. It would also require a large volume of resources for construction, although it would require few resources during operation and may reduce resource use at STWs where the volume of flow to be treated would be reduced through by the removal of flows.</p> <p>DWMP decision: This option is to be considered across all workstreams and during delivery of any DWMP schemes</p>
Infiltration reduction	<p>Improvements to the existing sewer network to reduce infiltration of groundwater</p> <p>e.g., using a “no dig” trenchless process to install sewer lining by inserting new epoxy-saturated pipe tubing into existing pipes, inflating the tubing and curing it into place with hot air, steam or blue light LED technology.</p>	<p>This option is assumed to be achieved by lining the existing sewer network, which has a dual purpose: to prevent groundwater ingress/infiltration to the sewer system and also to prevent pipes leaking sewage to ground. This option is assumed to use a “no dig” trenchless process to avoid excavation with the associated disruption, loss of biodiversity and resource use. It is assumed to be less resource intensive than building a new or replacement network, which has benefits for SEA topics such as heritage and carbon & material assets. This option will minimise leaks to the wider environment, benefitting both land and water quality. It also reduces the volume of wastewater requiring treatment, thus reducing SO events.</p> <p>DWMP decision: This option is to be considered across all workstreams and during delivery of any DWMP schemes</p>
Customer education (blockages)	<p>Continue ongoing business campaigns to prevent blockages</p>	<p>This option is assessed on the basis of campaigns continuing to ensure only the three P’s (pee, poo, paper) go down the toilet / into the sewer, to prevent blockages causing sewer flooding.</p> <p>DWMP decision: This option is unlikely to meet SODRP targets but will support the wider issues surrounding sewer network interference and blockage creating leading to flooding or pollution</p>
Misconnections	<p>This option is to investigate on any misconnections between</p>	<p>A misconnection is when the wastewater pipe has been wrongly connected to the surface water sewer pipe. So instead of going to a wastewater treatment works, it goes directly into a river or stream and causes pollution.</p>



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

Generic Options from DWMP24	Description and example options	Example of specific options and the assumptions made for assessment
	<p>the drainage and the foul sewer.</p>	<p>Through reconnection, there would be improvement in water quality and flooding. The option is neutral to biodiversity, human health, material asset, heritage, landscape and climate resilience.</p> <p>DWMP decision: This option is unlikely to meet SODRP targets but is a vital activity to reduce pollution incidents</p>
<p>Property level surface water management</p>	<p>Provides property owners with practical steps to lower flood risk, through the use of adaptable products.</p> <p>e.g., Barriers can be fitted to openings such as doors and windows, providing a seal to limit floodwater entry; automatic flood doors can be closed and locked on receipt of a flood warning; non-return valves (NRVs) can be fitted to drains around the home to prevent floodwater or sewage backing-up into the property; airbricks can be replaced with automatically closing airbricks to create a seal against floodwater; and/or pumps can help keep floodwater at manageable levels for those at risk of rising groundwater entering through the floor.</p>	<p>This can help by diverting flow away from vulnerable points on roads/ houses etc. (such as those in dips) and also keep it on a road or in the pipe with an NRV, this option is more about reducing the impact of flooding. This option is assumed to manage flood risk rather than address the root cause of flooding.</p> <p>DWMP decision: This option will be considered for modelled hydraulic flood risk reduction schemes</p>
<p>Per capita consumption reduction</p>	<p>Supporting reduced water consumption, to reduce the volume of sewage for treatment.</p>	<p>This option includes the water efficiency measures to be installed within buildings such as water efficiency indoor taps, toilet flushing appliances, shower and baths, washing machines and dishwaters. Such measures may be feasible both in new development, and by retrofitting through supplying to customers. This can benefit the wastewater system because it reduces the dry weather flow passing through the sewer network and through the WRCs</p>



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

Generic Options from DWMP24	Description and example options	Example of specific options and the assumptions made for assessment
	<p>e.g. supplying customers with household appliances which are designed to reduce water consumption.</p>	<p>This option is assessed on the basis it aims to reduce flow to the sewer network (both domestic and non-domestic flows) and WwTWs, reducing SO discharges by allowing an increased proportion of sewerage to be treated within the capacity of WwTWs, thus improving water quality.</p> <p>The option is primarily driven on an optional (stakeholder buy in) type model, leading to cost-savings for those on a water meter, rather than imposition of high-cost requirements to customers. The option includes a range of cost options, with a preference towards low-cost measures (such as water-butts), particularly for existing developments. Therefore, inclusivity is somewhat inherent in the option type, which is relevant within the assessment against the socio-economic SEA objective, providing particular benefit to those in deprivation (assuming they are metered and noting that not all customers are likely to be metered by 2030). As such, levels of deprivation across catchment types, influences the socio-economic score for this option.</p> <p>Given the measures will be installed internally, it is neutral to biodiversity.</p> <p>This option assesses positively in terms of addressing the causes of climate change and material assets (noting that some measures may require increased resource use to implement, however they would reduce water consumption), water and flood risk. In areas of deprivation, there is a minor positive effect from these measures for metered customers in instances where low-cost retrofit measures are implemented and where wider measures are implemented within new developments. It assesses positively in terms of resilience to climate change through reducing water consumption as pressure on resources increases.</p> <p>DWMP decision: This option is unlikely to meet SODRP targets but will help reduce flows and reduce need for investment at WwTW linked to growth</p>



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

In summary, the options being taken forward to meet storm overflow targets from the more detailed review of the shortlisted options are:

- Increase treatment capacity
- Network storage
- Impermeable surface water management – SuDS
- Catchment partnership support
- Impermeable area surface water removal – removal at source
- Infiltration reduction

As set out in the Table above, further measures will be taken forward during delivery of any DWMP schemes (e.g., catchment partnership support), or through other activities (e.g., customer education campaigns), or considered in future cycles and in development of site-specific solutions (e.g., rationalise assets).



5.4 SEA ASSESSMENT OF OPTIONS (LEVEL 2)

As proposed within the SEA Scoping Report, Level 2 catchments have been used to assess options on a strategic level, whilst maintaining the purposes of meaningful assessment. It should be noted that L2 SPA is an aggregation of L3 units. **Table 5.4.1** sets out a summary of the results and some of the driving factors for difference. The accompanying assessment matrices can be found in **Appendix D – Level 2 Results**.

Table 5.4.1 – Proposed Options

Level 2 Area
<i>Upper Dales</i>
<p>The Upper Dales is a mainly rural area, with a high proportion of environmental designations. It intersects with the North York Moors National Park, Yorkshire Dales National Park, North Pennines AONB, Nidderdale AONB, Howardian Hills AONB, etc.</p> <p>There are limited opportunities for blue-green corridors within this largely rural Level 2. Communities within this area, already have access to green space, therefore, there may be limited opportunities to enhance the environment and the community (in terms of health benefits). No negative impacts are predicted; however, siting would require further detailed assessment to maximise the beneficial potential this option could provide to biodiversity, human health, and landscape. This option provides a major benefit to flood risk and water quality if implemented, by reducing the frequency and extent of SO discharges.</p> <p>Upstream rural catchment management may provide opportunities to help address the flash flood risk that results from the steep topography within this catchment. It could provide natural flood management by holding back flows in the upstream part of the catchment through rural land management. It can lead to substantial habitat creation/ restoration/ improvement and is likely to benefit soils (including their carbon storage and sequestration capacity). The application of this option across large areas provides the opportunity to support a natural landscape, supporting natural ecosystem functions. Long term benefits to water quality as this option would likely result in few SO discharges to watercourses. However, there is the potential that this option would negatively impact farming land due to the heavily constrained area and farmland being a likely location for this option.</p>
<i>Esk & Coast</i>
<p>Esk & Coast is a mainly rural area, with a high proportion of environmental designations, including North York Moors National Park.</p> <p>There are limited opportunities for blue-green corridors within this largely rural Level 2. Communities within this area already have access to green space, therefore, there may be limited opportunities to enhance the environment and the community (in terms of health benefits), albeit there is potential for this option's benefits to be maximised in towns such as Scarborough. No negative impacts are predicted; however, siting would require further detailed assessment to maximise the beneficial potential this option could provide to biodiversity, human health, and landscape. This option provides a major benefit to flood risk and water quality if implemented, by reducing the frequency and extent of SO discharges.</p>



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

Level 2 Area

Upstream rural catchment management may provide opportunities to help address the flash flood risks that result from the steep topography within this catchment. It could provide natural flood management by holding back flows in the upstream part of the catchment through rural land management.

Long term benefits to water quality as this option would likely result in few SO discharges to watercourses. However, there is the potential that this option would negatively impact farming land due to the heavily constrained area and farm land being a likely location for this option.

Lower Dales

Lower Dales is a mainly rural area, with a high proportion of environmental designations. **It intersects with the Yorkshire Dales National Park and Nidderdale AONB.**

There may be an opportunity for blue-green corridors within some of the small towns but there is limited opportunity elsewhere within this largely rural Level 2. Communities within this area already have access to green space, therefore, there may be limited opportunities to enhance the environment and the community (in terms of health benefits), albeit there is potential for this option's benefits to be maximised in towns such as Harrogate, Wetherby, or Ilkley. No negative impacts are predicted; however, siting would require further detailed assessment to maximise the beneficial potential this option could provide to biodiversity, human health, and landscape. This option provides a major benefit to flood risk and water quality if implemented, by reducing the frequency and extent of SO discharges.

Upstream rural catchment management may provide opportunities to help address the flash flood risks that result from the steep topography within this catchment. It could provide natural flood management by holding back flows in the upstream part of the catchment through rural land management.

The construction of storage will be disruptive (especially below ground) and require careful siting and would have some potential short term negative impacts to biodiversity, human health, landscape, and heritage. Where storage is located online and thus typically within previously disturbed ground, often in the highway, the potential effects on the environment are lower. As the Lower Dales is not heavily constrained and the new infrastructure will be below ground, biodiversity, human health, landscape, and heritage result in neutral impact in the long term. Upgrades to existing STWs to increase treatment capacity would likely have a minor adverse impact to biodiversity, landscape, and heritage during construction, with a neutral impact to these receptors after construction, as there are minimal designations within the catchment.

Lower Don

The Lower Don is a mainly rural area, with a mix of small towns and a history of coal.

There may be an opportunity for blue-green corridors within some of the small towns but there is limited opportunity elsewhere within this largely rural Level 2.

Large scale construction would potentially have short term adverse impacts to human health, biodiversity, landscape, and heritage during the construction phase. Siting is important for the new infrastructure; however, the Lower Don is not as constrained as other L2 rural catchment areas.

The construction of storage will be disruptive (especially below ground) and require careful siting and would have some potential short term negative impacts to biodiversity, human health, landscape, and heritage. Where storage is located online and thus typically within previously disturbed ground, often in the highway, the potential effects on the environment are lower. As the Lower Don is not heavily constrained and the new infrastructure will be below ground, biodiversity, human health, landscape, and heritage result in neutral impacts in the long term. Upgrades to existing STWs to increase treatment capacity would likely have a minor adverse impact to biodiversity, landscape, and heritage during construction, with a neutral impact to these receptors after construction, as there are minimal designations within the catchment.



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

Level 2 Area
<i>Derwent & Rye</i>
<p>Derwent & Rye is a mainly rural area, with a high proportion of environmental designations. It intersects with the North York Moors National Park , Howardian Hills AONB and proposed Yorkshire Wolds AONB.</p> <p>There are limited opportunities for blue-green corridors within this largely rural Level 2, but some may be possible in the south where the land becomes flatter and more urbanised. The benefits of this option could be maximised in the small towns, such as Pickering, Pocklington, Norton and Malton. No negative impacts are predicted; however, siting would require further detailed assessment to maximise the beneficial potential this option could provide to biodiversity, human health, and landscape. This option provides a major benefit to flood risk and water quality if implemented, by reducing the frequency and extent of SO discharges.</p> <p>Upstream rural catchment management may provide opportunities to provide natural flood management by holding back flows in the upstream part of the catchment through rural land management.</p> <p>Derwent & Rye is heavily constrained to the north of the catchment as a National Park and AONB take up a large proportion of the land. Therefore, the construction and operation of new infrastructure will potentially have a negative impact on the environment. However, if located towards the south of the catchment with careful siting and planning, a long term neutral impact to biodiversity, landscape and heritage is possible.</p> <p>The construction of storage will be disruptive (especially below ground) and will require careful siting and would have some potential short term negative impacts to biodiversity, human health, landscape, and heritage. Where storage is located online and thus typically within previously disturbed ground, often in the highway, the potential effects on the environmental are lower. As the Level 2 area is not heavily constrained and the new infrastructure will be below ground, biodiversity, human health, landscape, and heritage result in neutral impacts in the long term. Upgrades to existing STWs to increase treatment capacity would likely have a minor adverse impact to biodiversity, landscape, and heritage during construction, and a neutral impact to these receptors after construction, as there are minimal designations within the catchment.</p>
<i>Holderness Coast</i>
<p>The Holderness Coast is a mainly rural area, with a mix of small towns. It intersects with the proposed Yorkshire Wolds AONB.</p> <p>There is an opportunity for blue-green corridors within the urban environment. There is an opportunity for this option to be maximised in towns (such as Hornsea or Bridlington) along the Holderness Coast to provide health benefits as access to nature is increased, as well as potential benefits to leisure and tourism as the blue/ green corridors transform the urban landscape, especially helpful for areas of higher deprivation within the Level 2 area. No negative impacts are predicted; however, siting would require further detailed assessment to maximise the beneficial potential this option could provide to biodiversity, human health, and landscape. This option provides a major benefit to flood risk and water quality if implemented, by reducing the frequency and extent of SO discharges.</p> <p>Large scale construction would potentially have short term adverse impacts to human health, biodiversity, landscape, and heritage during the construction phase. Siting is important for the new infrastructure; however, the Holderness Coast is not as constrained as other L2 rural catchment areas.</p> <p>The Holderness Coast is mainly rural, with a mix of small towns and is not as heavily constrained in terms of designations as other L2 catchment areas. The construction of storage will be disruptive (especially below ground) and will require careful siting and would have some potential short term negative impacts to biodiversity, human health, landscape, and heritage. Where storage is located online and thus typically within previously disturbed ground, often in the highway, the potential effects on the environmental are lower. As the Level 2 area is not heavily constrained and the new infrastructure will be below ground, biodiversity, human health, landscape, and heritage result in neutral impacts in the long term. Upgrades to existing STWs to</p>



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

Level 2 Area
<p>increase treatment capacity would likely have a minor adverse impact to biodiversity, landscape and heritage during construction, but would result in a neutral impact to these receptors after construction, as there are minimal designations within the catchment.</p>
<p>Lower Ouse</p> <p>Lower Ouse is a mainly rural area, with a mix of small towns.</p> <p>There is an opportunity for blue-green corridors within the urban environment. There is an opportunity for this option to be maximised in towns (such as Selby) to provide health benefits as access to nature is increased, as well as potential benefits to leisure and tourism as the blue/ green corridors transform the urban landscape, in otherwise deprived areas (e.g., Selby). Blue/green corridors provide multi-functional spaces offering management of surface water flows along with active travel routes (such as footpaths and cycle paths), typically within a planted setting. This option would be well suited to the towns of Selby and Barby due to their location close to the River Ouse. No negative impacts are predicted; however, siting would require further detailed assessment to maximise the beneficial potential this option could provide to biodiversity, human health, and landscape. This option provides a major benefit to flood risk and water quality if implemented, by reducing the frequency and extent of SO discharges.</p> <p>Large scale construction would potentially have short term adverse impacts to human health, biodiversity, landscape, and heritage during the construction phase. Siting is important for the new infrastructure; however, the Lower Ouse is not as constrained as other L2 rural catchment areas.</p> <p>The Lower Ouse is mainly rural, with a mix of small towns and is not as heavily constrained in terms of designations as other L2 catchment areas. The construction of storage will be disruptive (especially below ground) and require careful siting and would have some potential short term negative impacts to biodiversity, human health, landscape, and heritage. Where storage is located online and thus typically within previously disturbed ground, often in the highway, the potential effects on the environment are lower. As the Lower Ouse is not heavily constrained and the new infrastructure will be below ground, biodiversity, human health, landscape, and heritage result in neutral impact in the long term. Upgrades to existing STWs to increase storage capacity would likely have a minor adverse impact to biodiversity, landscape, and heritage during construction, but would result in a neutral impact to these receptors after construction, as there are minimal designations within the catchment.</p>
<p>Colne & Holme Valleys</p> <p>The Colne and Holme Valleys Level 2 is a mix of rural and urban areas, dominated by Special Protection Areas/ SACs/ Peak District National Park (amongst other designations) to the western boundary of the catchment and with Huddersfield located towards the north/north east part of the catchment.</p> <p>There is an opportunity for blue-green corridors within the urban environment, potentially to be maximised towards the east of the Level 2 area where the land is more urban. There is potential to green up city centres with above-ground SuDS features and planting. Blue/green corridors provide multi-functional spaces offering management of surface water flows along with active travel routes (such as footpaths and cycle paths), typically within a planted setting. Therefore, maximising the potential positive benefits of this option. Potential to provide health benefits as access to nature is increased, as well as potential benefits to leisure and tourism as the blue/green corridors transform the urban landscape, in otherwise deprived areas (e.g., Huddersfield). No negative impacts are predicted; however, siting would require further detailed assessment to maximise the beneficial potential this option could provide to biodiversity, human health, and landscape. This option provides a major benefit to flood risk and water quality if implemented, by reducing the frequency and extent of SO discharges.</p> <p>Potential further benefits to biodiversity when implementing SuDS within cities/towns. However, siting, and careful planning is important, as there may be a potential conflict with heritage due to the catchment being heavily constrained in terms of heritage designation.</p>



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

Level 2 Area

Upstream rural catchment management may provide opportunities to help address the flash flood risks that result from the steep topography within this catchment. It could provide natural flood management by holding back flows in the upstream part of the catchment through rural land management.

Large scale construction will have short term adverse impacts to human health, biodiversity, landscape, and heritage during the construction phase. Siting is important for new infrastructure. However, impacts are likely to be short term and operational works will be below ground.

The construction of storage will be disruptive (especially below ground) and require careful siting and would have some potential short term negative impacts to biodiversity, human health, landscape, and heritage. Where storage is located online and thus typically within previously disturbed ground, often in the highway, the potential effects on the environment are lower. As the new infrastructure will be below ground, biodiversity, human health, landscape, and heritage result in neutral impacts in the long term.

Upper Aire

The Upper Aire has a large proportion of environmental designations (notably, Special Protection Areas, SACs, the Yorkshire Dales National Park, **Nidderdale AONB** (amongst other designations)).

Due to the presence of these high value areas, siting and design of blue/ green corridors would require careful consideration to avoid negative impacts and bring about enhancements. There is likely to be some opportunity for this option to be maximised within the towns and city, especially in and around Bradford. Potential to green up town/city centres with above-ground SuDS features and planting. Blue/ green corridors provide multi-functional spaces offering management of surface water flows along with active travel routes (such as footpaths and cycle paths), typically within a planted setting. Therefore, potential to maximise the positive benefits of this option. Potential to provide health benefits as access to nature is increased, as well as potential benefits to leisure and tourism as the blue/green corridors transform the urban landscape, in otherwise deprived areas (e.g., Bradford). No negative impacts are predicted; however, siting would require further detailed assessment to maximise the beneficial potential this option could provide to biodiversity, human health, and landscape. This option provides a major benefit to flood risk and water quality if implemented, by reducing the frequency and extent of SO discharges.

Potential further benefits to biodiversity when implementing SuDS within cities/towns such as Bradford. However, siting, and careful planning is important, as there may be a potential conflict with heritage due to the catchment being heavily constrained in terms of heritage designation.

Upstream rural catchment management may provide opportunities to help address the flash flood risks that result from the steep topography within this catchment. It could provide natural flood management by holding back flows in the upstream part of the catchment through rural land management.

Large scale construction will potentially have short term adverse impacts to human health, biodiversity, landscape, and heritage during the construction phase. Siting is important for new infrastructure; however, impacts are likely to be short term and operational works will be below ground.

The construction of storage will be disruptive (especially below ground) and require careful siting and would have some potential short term negative impacts to biodiversity, human health, landscape, and heritage. Where storage is located online and thus typically within previously disturbed ground, often in the highway, the potential effects on the environment are lower. As the new infrastructure will be below ground, biodiversity, human health, landscape, and heritage result in neutral impacts in the long term.

Dearne



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

Level 2 Area

Dearne is a mix of rural and urban areas, dominated by Special Protection Areas /SAC/ Peak District National Park (amongst other designations) to the western boundary of the catchment and Barnsley located towards the centre and east part of the catchment.

There is an opportunity for blue-green corridors within the urban environment, especially in towns in the centre and east of the Level 2 area where the land is more urban. This provides the potential to green up city centres with above-ground SuDS features and planting. Blue/ green corridors provide multi-functional spaces offering management of surface water flows along with active travel routes (such as footpaths and cycle paths), typically within a planted setting. Therefore, maximising the potential positive benefits of this option. Health benefits may be provided as access to nature is increased, as well as potential benefits to leisure and tourism as the blue/ green corridors transform the urban landscape, in otherwise deprived areas (e.g., Barnsley). No negative impacts are predicted; however, siting would require further detailed assessment to maximise the beneficial potential this option could provide to biodiversity, human health, and landscape. This option provides a major benefit to flood risk and water quality if implemented, by reducing the frequency and extent of SO discharges.

Potential further benefits to biodiversity when implementing SuDS within cities/ towns. However, siting, and careful planning is important to avoid designations.

Large scale construction will potentially have short term adverse impacts to human health, biodiversity, landscape, and heritage during the construction phase. Siting is important for new infrastructure; however, impacts are likely to be short term and operational works will be below ground.

The construction of storage will be disruptive (especially below ground) and require careful siting and would have some potential short term negative impacts to biodiversity, human health, landscape, and heritage. Where storage is located online and thus typically within previously disturbed ground, often in the highway, the potential effects on the environment are lower. As the new infrastructure will be below ground, biodiversity, human health, landscape, and heritage result in neutral impacts in the long term.

Rother & Doe Lea

Rother & Doe Lea is a mixed rural and urban area, with a mix of small towns. It intersects with the Peak District National Park. It is not as heavily constrained as other L2 catchment areas in terms of designations.

There is an opportunity for blue-green corridors within the urban environment. Particularly in towns this may provide health benefits as access to nature is increased, as well as potential benefits to leisure and tourism as the blue/ green corridors transform the urban landscape, in otherwise deprived areas. No negative impacts are predicted; however, siting would require further detailed assessment to maximise the beneficial potential this option could provide to biodiversity, human health, and landscape. This option provides a major benefit to flood risk and water quality if implemented, by reducing the frequency and extent of SO discharges.

Potential further benefits to biodiversity when implementing SuDS within cities/ towns. However, siting, and careful planning is important to avoid designations.

Large scale construction will potentially have short term adverse impacts to human health, biodiversity, landscape, and heritage during the construction phase. Siting is important for new infrastructure; however, impacts are likely to be short term and operational works will be below ground.

The construction of storage will be disruptive (especially below ground) and require careful siting and would have some potential short term negative impacts to biodiversity, human health, landscape, and heritage. Where storage is located online and thus typically within previously disturbed ground, often in the highway, the potential effects on the environment are lower. As the new infrastructure will be below ground, biodiversity, human health, landscape, and heritage result in neutral impacts in the long term.

Upgrades to existing STWs to increase storage capacity would likely have a minor adverse impact to biodiversity, landscape, and heritage during construction, but would result in a neutral impact to these receptors after construction, as there are minimal designations within the catchment.



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

Level 2 Area
Calder
<p>There is an opportunity for blue-green corridors within the urban environment. Particularly in towns (such as Wakefield and Halifax) there is potential to provide health benefits as access to nature is increased, as well as potential benefits to leisure and tourism as the blue/green corridors transform the urban landscape, in otherwise deprived areas. No negative impacts are predicted; however, siting would require further detailed assessment to maximise the beneficial potential this option could provide to biodiversity, human health, and landscape. This option provides a major benefit to flood risk and water quality if implemented, by reducing the frequency and extent of SO discharges.</p> <p>Potential further benefits to biodiversity when implementing SuDS within cities/ towns. However, siting, and careful planning is important to avoid designations.</p> <p>Large scale construction will potentially have short term adverse impacts to human health, biodiversity, landscape, and heritage during the construction phase. Siting is important for new infrastructure; however, impacts are likely to be short term and operational works will be below ground.</p> <p>The construction of storage will be disruptive (especially below ground) and require careful siting and would have some potential short term negative impacts to biodiversity, human health, landscape, and heritage. Where storage is located online and thus typically within previously disturbed ground, often in the highway, the potential effects on the environment are lower. As the new infrastructure will be below ground, biodiversity, human health, landscape, and heritage result in neutral impacts in the long term.</p>
Lower Aire
<p>The Lower Aire is a mix of urban and rural with a history of coal.</p> <p>There is an opportunity for blue-green corridors within the urban environment. Particularly in towns (such as Castleford or Pontefract) there is potential to provide health benefits as access to nature is increased, as well as potential benefits to leisure and tourism as the blue/ green corridors transform the urban landscape. No negative impacts are predicted; however, siting would require further detailed assessment to maximise the beneficial potential this option could provide to biodiversity, human health, and landscape. This option provides a major benefit to flood risk and water quality if implemented, by reducing the frequency and extent of SO discharges.</p> <p>Potential further benefits to biodiversity when implementing SuDS within cities/ towns such as Castleford or Pontefract. However, siting and careful planning is important to avoid designations.</p> <p>Large scale construction will potentially have short term adverse impacts to human health, biodiversity, landscape, and heritage during the construction phase. Siting is important for new infrastructure; however, impacts are likely to be short term and operational works will be below ground.</p> <p>The construction of storage will be disruptive (especially below ground) and require careful siting and would have some potential short term negative impacts to biodiversity, human health, landscape, and heritage. Where storage is located online and thus typically within previously disturbed ground, often in the highway, the potential effects on the environment are lower. As the new infrastructure will be below ground, biodiversity, human health, landscape, and heritage result in neutral impacts in the long term.</p>
York
<p>York is mainly urban but surrounded by rural areas on the outskirts of the catchment.</p> <p>There is an opportunity for blue-green corridors within the urban environment. These would potentially provide health benefits as access to nature is increased, as well as potential benefits to leisure and tourism as the blue/green corridors transform the urban landscape. No negative impacts are predicted; however, siting would require further detailed assessment to maximise the</p>



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

Level 2 Area
<p>beneficial potential this option could provide to biodiversity, human health, and landscape. This option provides a major benefit to flood risk and water quality if implemented, by reducing the frequency and extent of SO discharges.</p> <p>Potential further benefits to biodiversity when implementing SuDS within cities/ towns such as York. However, siting, and careful planning is important to avoid designations. Heritage designations are of both high quality and high density across York.</p> <p>The construction of storage will be disruptive (especially below ground) and require careful siting and would have some potential short term negative impacts to biodiversity, human health, landscape, and heritage. Where storage is located online and thus typically within previously disturbed ground, often in the highway, the potential effects on the environment are lower. As the new infrastructure will be below ground, biodiversity, human health, landscape, and heritage result in neutral impacts in the long term.</p>
Sheffield
<p>Sheffield is mainly urban, dominated by Special Protection Areas /SAC/ Peak District National Park (amongst other designations) to the western boundary of the catchment and the city of Sheffield is located towards the centre and eastern part of the catchment.</p> <p>There is an opportunity for blue-green corridors within the urban environment. These have the potential to green up city centres with above-ground SuDS features and planting. Blue/green corridors provide multi-functional spaces offering management of surface water flows along with active travel routes (such as footpaths and cycle paths), typically within a planted setting. Therefore, maximising the potential positive benefits of this option. They potentially provide health benefits as access to nature is increased, as well as potential benefits to leisure and tourism as the blue/green corridors transform the urban landscape. No negative impacts are predicted; however, siting would require further detailed assessment to maximise the beneficial potential this option could provide to biodiversity, human health, and landscape. This option provides a major benefit to flood risk and water quality if implemented, by reducing the frequency and extent of SO discharges.</p> <p>Siting and careful planning is important, as there may be a potential conflict with heritage due to the catchment being heavily constrained in terms of heritage designations or unknown buried archaeology, mainly within the city centre.</p> <p>Large scale grey construction options are more likely to have short term adverse impacts to human health, biodiversity, landscape, and heritage during the construction phase.</p> <p>The construction of storage will be disruptive (especially below ground) and require careful siting and would have some potential short term negative impacts to biodiversity, human health, landscape, and heritage. Where storage is located online and thus typically within previously disturbed ground, often in the highway, the potential effects on the environment are lower. As the new infrastructure will be below ground, biodiversity, human health, landscape, and heritage result in neutral impacts in the long term.</p>
Leeds
<p>Leeds is predominantly urban, with limited environmental designations.</p> <p>There is an opportunity for blue-green corridors within the urban environment. These provide the potential to green up city centres with above-ground SuDS features and planting. Blue/ green corridors provide multi-functional spaces offering management of surface water flows along with active travel routes (such as footpaths and cycle paths), potentially along the Leeds and Liverpool canal, typically within a planted setting. Therefore, maximising the potential positive benefits of this option. They have potential to provide health benefits as access to nature is increased, as well as potential benefits to leisure and tourism as the blue/green corridors transform the urban landscape. No negative impacts are predicted; however, siting would require further detailed</p>



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

Level 2 Area

assessment to maximise the beneficial potential this option could provide to biodiversity, human health, and landscape. This option provides a major benefit to flood risk and water quality if implemented, by reducing the frequency and extent of SO discharges.

Siting and careful planning is important, as there may be a potential conflict with heritage due to the catchment being heavily constrained in terms of heritage designation or unknown buried archaeology, mainly within the city centre. However, Leeds has less heritage designations than Sheffield (for example).

Large scale grey construction options are more likely to have short term adverse impacts to human health, biodiversity, landscape, and heritage during the construction phase.

The construction of storage will be disruptive (especially below ground) and require careful siting and would have some potential short term negative impacts to biodiversity, human health, landscape, and heritage. Where storage is located online and thus typically within previously disturbed ground, often in the highway, the potential effects on the environment are lower. As the new infrastructure will be below ground, biodiversity, human health, landscape, and heritage result in neutral impacts in the long term.

Hull

Hull is predominantly urban to the west of the catchment, with limited environmental designations (apart from notably, the Humber Estuary (SAC/ Special Protection Areas/ Ramsar) along the southern boundary of the catchment).

There is an opportunity for blue-green corridors within the urban environment. These provide the potential to green up city centres with above-ground SuDS features and planting. Blue/green corridors provide multi-functional spaces offering management of surface water flows along with active travel routes (such as footpaths and cycle paths), typically within a planted setting. Therefore, maximising the potential positive benefits of this option. They potentially provide health benefits as access to nature is increased, as well as potential benefits to leisure and tourism as the blue/green corridors transform the urban landscape. No negative impacts are predicted; however, siting would require further detailed assessment to maximise the beneficial potential this option could provide to biodiversity, human health, and landscape. This option provides a major benefit to flood risk and water quality if implemented, by reducing the frequency and extent of SO discharges.

Large scale grey construction options are more likely to have short term adverse impacts to human health, biodiversity, landscape, and heritage during the construction phase.

The construction of storage will be disruptive (especially below ground) and require careful siting and would have some potential short term negative impacts to biodiversity, human health, landscape, and heritage. Where storage is located online and thus typically within previously disturbed ground, often in the highway, the potential effects on the environment are lower. As the new infrastructure will be below ground, biodiversity, human health, landscape, and heritage result in neutral impacts in the long term.



6.0 DEVELOPMENT AND ASSESSMENT OF THE OPTIONS FOR THE OVERALL DWMP

6.1 DEVELOPMENT OF APPROACH AND SCENARIOS

6.1.1 Approach

The options considered within Section 5 can be broadly defined by the approach taken as reduce and enhance blue-green plus grey options (those adopting a nature-based solution such as SuDS to remove 50% of the impermeable area, with the remaining need met through provision of grey options); and enhance grey options (such as network storage, where infrastructure is required):

Reduce and Enhance - Blue-green options

- Impermeable surface water management – SuDS
- Catchment partnership support
- Impermeable area surface water removal – removal at source
- Supported by grey options to meet the remaining need

Enhance - Grey options:

- Increase treatment capacity
- Network storage
- Infiltration reduction

At the strategic level of the DWMP, Yorkshire Water has identified the approach to take to meet the requirements of the plan. During implementation of the plan, the capital delivery process will then identify the most appropriate option(s) to take forward within this approach, based on more detailed review of the specific project location within a local catchment.

6.1.2 Summary of Need

Through application of the DWMP24 process outlined in **Figure 1.4.1** and **Table 5.1.1** and following on from consultation and changes in approach from draft to final YW have identified which storm overflow sites require intervention across the asset base. YW have also identified where flood clusters require intervention to reduce modelled hydraulic flood risk. In relation to WwTW, YW have identified where WINEP and growth schemes are required to ensure WwTW flow and quality compliance is maintained. All these interventions are to changes in regulation or achieve targets and accommodate growth, climate change and creep.



6.1.3 Development of Plan Scenarios

YW have developed a long-term plan supported using its decision-making framework tool and its cost and benefits principles. YW have created a core, preferred and least cost plan as set out in **Table 6.1.1**. In each scenario the plan has been constrained to deliver the regulatory requirements and targets of the SODRP alongside ensuring that WINEP and growth programmes for WwTW compliance are met. The least cost plan is a predominately grey solution plan. The core and preferred plan have had a company ambition applied to the SODRP to deliver 20% blue-green solutions in AMP8 and 50% blue-green solutions in each subsequent AMP. Some flood risk reduction is achieved as a secondary benefit through the core and least cost plan where blue-green SODRP interventions are made. Modelled hydraulic flood risk is tackled directly through additional measures in the Preferred Plan.

Table 6.1.1 – Proposed Plans

Plan	Achieves	Approach (Grey or Blue-Green with Grey)	Flood Protection
Least Cost Plan	<ul style="list-style-type: none"> Address SODRP targets (compliance) Address WINEP WwTW and growth metric (compliance) 	<ul style="list-style-type: none"> <1% blue-green delivery for SODRP 	<ul style="list-style-type: none"> Minimal modelled hydraulic flood risk
Core Plan	<ul style="list-style-type: none"> Address SODRP targets (compliance) with company blue-green ambition applied Address WINEP WwTW and growth metric (compliance) 	<ul style="list-style-type: none"> 20% blue-green delivery on Storm overflows in AMP8, 50% blue-green delivery on Storm overflows in AMPs 9,10,11,12 	<ul style="list-style-type: none"> Increasing levels of modelled hydraulic flood risk impact linked to delivery of blue-green SODRP solutions
Preferred Plan	<ul style="list-style-type: none"> Address SODRP targets (compliance) with company blue-green ambition applied Address WINEP WwTW and growth metric (compliance) Incorporates modeled hydraulic flood risk solutions 	<ul style="list-style-type: none"> 20% blue-green delivery on Storm overflows in AMP8, 50% blue-green delivery on Storm overflows in AMP9,10,11,12 	<ul style="list-style-type: none"> Modelled hydraulic flood risk reduction to all 1 in 30-year return period internal flooding by delivering SODRP blue-green solutions and dedicated flood risk reduction programme



6.1.4 Adaptive Planning

As the future is inherently uncertain in terms of climate change, growth and new technologies it is essential that the DWMP strategy is flexible enough to cope with changes. The DWMP24 adopts an adaptive planning approach which enables strategies to be developed in the context of different future scenarios. As part of completion of Ofwat’s data tables, a series of adaptive pathways have been compiled as detailed above and the preferred plan has been sensitivity tested to demonstrate the changes in costs of adverse climate change and adverse growth on the preferred plan.

In general, each periodic review will determine spend and performance commitments will monitor performance. There will be many and varied triggers which will bring about a change to an adaptive pathway or within the adaptive pathway for the DWMP. These are listed below:

- Each cycle of the DWMP will bring about changes and decisions based on the latest information and data sets available to apply to our models and assets.
- A regulatory change
- WINEP requirements on each Periodic Review
- Data provided by the SODRP investigations into no local ecological harm
- Data provided by Event Duration Monitoring (EDM), real-time EDM / Continual Water Quality monitors
- Increased confidence and development of blue-green solutions
- Partnership opportunities/co-funding opportunities

6.2 SEA ASSESSMENT OF THE PLANS

This section assesses the three plans for the combined options for the DWMP as a whole (the earlier Chapter 5 assessed the individual options available within the plan).

KEY:

Major positive	+++	Moderate positive	++	Minor positive	+	Neutral	0
Major negative	---	Moderate negative	--	Minor negative	-	No relationship	



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

Table 6.2.1 – SEA Assessment Matrix of the DWMP24

Level 1 Study Area									
	<i>Protect, conserve, and enhance biodiversity & geodiversity, including soils</i>	<i>Protect, conserve, and enhance Human Health and well-being, including resilient communities</i>	<i>Protect, conserve, and enhance social and economic prosperity</i>	<i>Address causes of climate change, manage and improve efficient use of resources, inc. carbon, emissions to air & waste generation</i>	<i>Protect, conserve, and enhance water resources</i>	<i>Reduce and manage flood risk, increasing flood resilience</i>	<i>Protect, conserve, and enhance the historic environment, including archaeology</i>	<i>Conserve, protect and enhance the landscape, townscape, and visual amenity</i>	<i>Adapt, and improve resilience to climate change</i>
	Biodiversity and Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
Least Cost Plan									
Overall DWMP24: during construction	--	0	+	--	0		-	0	
Overall DWMP24: during operation	++	+	0	--	++	+	+	0	+
Core Plan									
Overall DWMP24: during construction	-	0	+	-	0		-	0	
Overall DWMP24: during operation	+++	++	+++	-	+++	++	+	+	+++
Preferred Plan									
Overall DWMP24: during construction	-	0	+	-	0		-	0	
Overall DWMP24: during operation	+++	+++	+++	-	+++	+++	+	+	+++



Table 6.2.2 – Assessment Narrative

SEA Objective	Description
Biodiversity & Geodiversity	The blue/ green approach offers the potential for long term positive effects on terrestrial biodiversity and geodiversity such as through habitat creation, habitat retention and linking of habitats. Both the core and preferred plan will provide 50% blue-green delivery by 2050.
Human Health	<p>For the three scenarios, SOs discharging to designated bathing waters will be reduced, providing a permanent positive effect on human health.</p> <p>The plan will reduce sewer flood risk to properties, although the extent of improvements will vary depending which plan is selected. Whist measures to address storm overflow issues are likely to aid flood risk reduction. The least cost plan provides the lowest level of modelled hydraulic flood risk reduction with the core plan providing a moderate level of protection and the preferred plan offering the highest level of modelled hydraulic flood risk reduction.</p>
Socio-economic	The increasing flood risk reduction seen from the least cost plan through to the preferred plan will have a corresponding increasingly positive, permanent, long-term socio-economic impact. Further, the blue-green approach provides an opportunity for a more attractive environment, which is likely to draw in investment and enhance the value of property, and can provide active travel routes (such as footpaths and cycle paths), increasing low-cost transport options. As such the positive socio-economic effects increase from least cost to preferred plan.
Carbon & Material Assets	<p>Given the scale of grey infrastructure (such as below ground storage) to be implemented through the core pathway of least cost, there is expected to be a moderate adverse effect on carbon and material assets through the construction of grey infrastructure, and the subsequent on-going increased wastewater treatment requirements.</p> <p>In contrast, blue/ green infrastructure is typically less resource intensive to construct, operate, or maintain, providing nature-based solutions. There may be opportunities through adaptive planning to increase the uptake of this hybrid approach through the implementation of the plan, thus reducing the significance of the impact.</p> <p>The implementation of the three plans is likely to increase pressure on land use. Grey infrastructure such as below ground storage and WwTW upgrades require relatively small areas of land on a permanent basis. Blue/ green infrastructure must be applied over much larger areas, however, it can be integrated with other land uses.</p>
Water Resources	There are no substantive difference between the plans.
Flood Risk	The least cost plan provides the lowest level of modelled hydraulic flood risk reduction with the core plan providing a moderate level of protection and the preferred plan offering the highest level of modelled hydraulic flood risk reduction.
Heritage	There are no substantive difference between the plans.
Landscape	Below ground grey infrastructure, once restored post construction, is not anticipated to have a landscape impact.



SEA Objective	Description
	Where blue/ green infrastructure measures are planned within urban areas, there is potential for a positive benefit in terms of townscape (design dependent); where planned within rural areas there is potential for positive landscape impact (dependent on design reflecting the local landscape charter). Given the proposed scale of implementation of this option, it is noted as a minor positive permanent impact.
Climate Change Resilience	Grey infrastructure, such as below ground storage, will provide wastewater storage for later treatment and release, supporting climate change resilience. Blue/ green infrastructure will increase climate change resilience by slowing the flow of water, promoting natural flood risk reduction, supporting biodiversity in terms of habitats and their connectivity and in urban areas helping to counter the urban heat island effect. Given the extent of such infrastructure proposed through the core and preferred approach, this could be a major positive effect.

6.3 OTHER RELATED ASSESSMENTS INCLUDING HRA

Through the development of the plan, consideration has been given to other related assessments at the plan level:

- Habitats Regulations Assessment
- Invasive Non-Native Species (INNS) Risk Assessment
- Water Framework Directive (WFD) Assessment
- Biodiversity Net Gain Assessment

6.3.1 Habitats Regulations Assessment

An HRA Stage 1 Screening and Stage 2 Appropriate Assessment has been undertaken at plan level to check if proposals within the plan are likely to have a significant effect on the conservation objectives of sites within the national site network (previously known as 'European Sites'), i.e., Special Protection Areas and Special Areas of Conservation. The screening has identified the relevant sites within and adjacent to (within 5km) of the study area, their qualifying features, and the potential negative and positive impacts on the sites.

Through a review of the DWMP in relation to these sites, it has been possible to screen out some L3 catchments from further consideration due to distance and a lack of hydrological connectivity resulting in no likely significant effect to the national site network. The remaining L3 catchments underwent plan level appropriate assessment, screening out further catchments. At this stage, given the strategic nature of the plan and the proposed measures (which are currently not location or scheme specific), it has not been



possible to screen out some catchments/measures, as such further HRA screening will be required as the plan develops.

There is potential for the DWMP to result in positive impacts to the national site network (such as through improved water quality), as well as negative impacts (such as through construction works).

The plan level appropriate assessment carried out on the remaining L3 catchments shows that with appropriate mitigation, no likely impact is expected on any protected sites. Whilst there are high level threats identified within the report, these are expected to be mitigated by siting the options appropriately, i.e., not siting options within European Sites or within 500-1000m of any European Sites. Importantly, another full HRA including stage 1 screening and stage 2 appropriate assessment where appropriate will be conducted on each L3 catchment at project level when more information is available.

6.3.2 Invasive Non-Native Species Risk Assessment

The SEA framework has considered the risks posed by INNS at a strategic level under the Biodiversity SEA Objective. At the strategic level, the SEA has not identified any high-risk activities such as water transfers within the DWMP, however more detailed INNS assessment may be required if substantial changes are made post implementation if any options involve water transfers or other high-risk activities. INNS assessment determines the risk posed by INNS based on the species present, the relevant pathways and the receptors that could be impacted.

6.3.3 Biodiversity Net Gain Assessment

At this strategic level, awareness of the requirement to achieve biodiversity net gain for development projects has been considered through the SEA framework to influence options selection (including aiming to prevent the selection of options involving significant biodiversity loss). Whilst the statutory requirements of the Environment Act will only apply to projects requiring planning permission, the NERC Act duty to 'enhance' biodiversity also applies. NWG aims to deliver biodiversity net gain of at least 10% on all projects requiring planning permission and no net loss of biodiversity within permitted developments.



7.0 SEA ASSESSMENT OF THE PREFERRED PLAN DWMP24 AND CUMULATIVE EFFECTS

This section assesses the overarching DWMP24 as a whole (the earlier **Sections 5** and **6** assessed the individual options available within the plan and the options for the plan overall).

YW have chosen to follow the preferred plan as it meets the regulatory requirements in line with the SODRP, WINEP and WwTW growth needs. It also provides provision for hydraulic flood risk reduction. It applies their company ambition to deliver more blue-green solutions. The core and least costs plans deliver minimal hydraulic flood risk reduction which is not in line with the consultation feedback and the least cost plan delivers minimal blue-green interventions which does not deliver expectations set out in the consultation feedback or provide wider benefits.

The DWMP24 aims to protect and enhance the environment, support resilient communities, and contribute to economic growth. The outcomes of the DWMP24 relate to key issues for drainage and wastewater: environmental improvements to tackle SOs, WwTW flow and quality compliance and modelled hydraulic flood risk, whilst accommodating climate change, growth and creep. The most sensitive environments are prioritised for action first. As such the overall direction and purpose of the DWMP24 shows positive alignment with the SEA objectives.

Table 7.1.1 below draws together the total effects of the DWMP24 in combination with the underlying trend, to establish the cumulative effect. The total effects and the cumulative effects of the plan can be defined as:

DWMP24 (overall approach, options selected, outcome) = total plan effects

Total plan effects + 'likely future without the plan' = cumulative effects

The likely future without the plan includes the changes that are likely to happen in the background outside of the control of the plan, whilst the plan is being implemented. This is presented as part of the baseline review in **Appendix C**.



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

Key:

Major positive		Moderate positive		Minor positive		Neutral	
Major negative		Moderate negative		Minor negative		No relationship	

Table 7.1.1 - Total Plan Effects and Cumulative Effects

SEA Objective	Total plan effects	Cumulative effects
Biodiversity & Geodiversity	<p>The plan prioritises measures where SOs are discharging in or close to high priority sites (as defined by SODRP). This will provide a significant positive permanent benefit for aquatic biodiversity. As the implementation of the plan progresses, the benefits of the plan will extend across the plan area.</p> <p>WwTW upgrades to cope with additional demand from population growth will prevent damage to aquatic biodiversity from that population increase.</p> <p>The blue/ green approach offers the potential for long term positive effects on terrestrial biodiversity and geodiversity, with 50% blue-green delivery to be implemented by 2050. Within rural areas, catchment management provides an opportunity to slow the rate of drainage, including of important habitats, contributing to rewilding and supporting natural hydrogeological processes. Within more urban areas, blue/green corridors and SuDS provide opportunities to provide/ enhance biodiversity. The level of benefit achieved will depend on the extent of implementation of these green options, and their design.</p> <p>The construction of grey infrastructure (and to some extent blue/green infrastructure) and WwTW upgrades will result in localised temporary loss of biodiversity during construction. The significance of the effect will depend on the current land use and ecological value (e.g., ranging from no value within a highway, to high value within a</p>	<p>Climate change will impact wildlife in the future by various means including, but not limited to, drought, timing of seasonal activities, higher frequency of storms, native species redistribution, invasive non-native species, and increased potential for wildfire.</p> <p>Changing climate could impact on the quality of soils across the region through temperature extremes and changing rainfall patterns.</p> <p>Development pressure is likely to increase the risk of habitat loss and fragmentation, particularly outside of the extensive designated areas.</p> <p>Through partnership working, measures such as blue/green infrastructure offer the potential to increase resilience to climate change by allowing the movement of species through the environment and supporting natural soil processes.</p> <p>Reduced spills from SOs and WwTW upgrades will support biodiversity, reducing susceptibility to the above threats.</p>



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

SEA Objective	Total plan effects	Cumulative effects
	<p>designated site). Careful siting, planning and construction will be required to avoid and minimise impacts. Potential exists for biodiversity net gain within reinstatement (again, this will be location specific).</p>	
Human Health	<p>Human health is particularly important in this region where the health of residents is slightly lower than the average for England, with some health indicators significantly below the national average in some parts of the region.</p> <p>SOs discharging to designated bathing waters will be reduced, providing a permanent positive effect on human health. This may increase the uptake of open water swimming, providing further health and well-being benefits.</p> <p>The plan will reduce sewer flood risk to properties, with the greatest extent provided by the Preferred Plan of over 40,000 internal flood incidents predicted to be prevented by 2050. The reductions will provide immediate permanent human health benefits in relation to health (exposure to sewage) and well-being (stress, anxiety).</p> <p>Blue/ green infrastructure measures provide an opportunity to provide access to green spaces with improved connectivity through them, providing a permanent positive effect on human health. The level of benefit achieved will depend on the extent of implementation of these green options, and their design.</p> <p>Potential exists to provide public access above below-ground grey infrastructure assets (such as storage), such as play areas, gyms, etc. (this will be location specific).</p>	<p>The population of the UK is ageing, putting additional pressures on public finances and services. Policy is placing increasing emphasis on access to green space, green infrastructure, and improved accessibility to sustainable modes of transport. Surface Water Management measures provide an opportunity to support these measures, improving health and well-being.</p>
Socio-economic	<p>Given the scale of work that will need to be implemented through the plan, there is likely to be a socio-economic boost such as employment opportunities through the construction phase. Whilst this will be temporary, it is expected to continue in the long-term.</p>	<p>In both the short and longer term, there is uncertainty in relation to socio-economics across the country. Whilst the plan is unlikely to substantially affect this, the flood risk reduction and water quality improvement measures will reduce risks and support a good economic and social environment.</p>



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

SEA Objective	Total plan effects	Cumulative effects
	<p>The plan area experiences higher than average levels of unemployment, with a large number of neighbourhoods being the most deprived nationally. This can result in communities being more susceptible to the effects of flooding (e.g., residents are less likely to have home insurance or available funds for clean-up and replacement of goods).</p> <p>Where flood risk is reduced and the blue-green approach is adopted, given the scale of blue/ green infrastructure required, the socio-economic effects are likely to be a major positive, permanent effect. Environmental attractiveness draws in investment and enhances the value of property, contributing to the conditions for growth and economic security, contributing to public health and civic pride. The multi-functional nature of blue/ green corridors can provide active travel routes (such as footpaths and cycle paths), increasing low-cost transport options and recreational opportunities and providing opportunities for community cohesion on a permanent basis.</p>	
Carbon & Material Assets	<p>Given the scale of grey infrastructure (such as below ground storage) to be implemented through the core pathway of least cost, there is expected to be a moderate adverse effect on carbon and material assets through the construction of grey infrastructure, and the subsequent on-going increased wastewater treatment requirements.</p> <p>In contrast, blue/ green infrastructure is typically less resource intensive to construct, operate, or maintain, providing nature-based solutions. There may be opportunities through adaptive planning to increase the uptake of this hybrid approach through the implementation of the plan, thus reducing the significance of the impact.</p> <p>The DWMP may increase pressure on land use. Grey infrastructure such as below ground storage and WwTW upgrades require relatively small areas of land on a permanent basis. Blue/ green infrastructure must be applied over much larger areas, however, it can be integrated with other land uses.</p>	The future trend is towards reducing carbon emissions and increased resource efficiency, which is not supported through the grey infrastructure approach and is supported through the blue/ green infrastructure approach.



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

SEA Objective	Total plan effects	Cumulative effects
Water Resources	<p>The DWMP24 will result in positive permanent effects on water quality through reduction in spills from SOs and WwTW improvements to accommodate population growth and the changing climate. This will have secondary benefits for biodiversity, human health, and socio-economics. The benefits increase with the adoption of blue/ green infrastructure through the support of natural hydrological processes such as increased infiltration of surface water.</p> <p>There is potential for short-term, localised, temporary pollution of watercourses through construction works in close proximity to watercourses. However, in line with legal requirements and best practice, these are anticipated to be prevented through good construction practices.</p>	<p>Climate change and growth are anticipated to increase stress on the water environment, such as through changing rainfall patterns, extreme weather events and increased demand for water and associated wastewater treatment requirements. The DWMP24 has accounted for these pressures and is designed to address them to help address these issues.</p>
Flood Risk	<p>The DWMP will result in positive permanent effects by reducing the modelled hydraulic flood risk, both directly by measures target to flood risk and indirectly as a secondary benefit when tackling storm overflows using the blue-green approach.</p> <p>The Preferred Plan is predicted have the largest impact of hydraulic flood risk reduction. Hence, it will have significant positive, permanent, long-term effect to flooding.</p> <p>Further positive permanent effects may also be achieved in terms of reduced surface water flood risk where surface water management is improved to reduce the risk of sewer flooding.</p>	<p>Flood risk (from all sources of flooding) is anticipated to increase as climate change progresses as a result of changing rainfall volumes and intensity. The draft DWMP24 has accounted for the anticipated changes whilst reducing the risk of sewer flooding to help address this issue.</p>
Heritage	<p>At the plan level, there are no anticipated significant effects on heritage assets, although sewer flood risk reduction measures are likely to reduce the sewer flood risk to some heritage assets, such as Listed Buildings, providing a minor positive permanent effect.</p> <p>Construction works, particularly those that involve ground works are likely to have a minor negative effect on heritage assets, particularly archaeology. However, this will be location specific, with potential for significant adverse effects at the project level which will require further controls (see Table 8.1.1 below).</p>	<p>Historic assets may be at greater risk from the direct impacts of future climate change, through flooding, sea level change, storms, and other factors; the DWMP24 will help to address those risks associated with sewer flooding.</p>



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

SEA Objective	Total plan effects	Cumulative effects
Landscape	<p>Below ground grey infrastructure, once restored post construction, is not anticipated to have a landscape impact.</p> <p>Where blue/ green infrastructure measures are planned within urban areas, there is potential for a positive benefit in terms of townscape (design dependent); where planned within rural areas there is potential for positive landscape impact (dependent on design reflecting the local landscape charter). Given the proposed scale of implementation of this option, it is noted as a minor positive permanent impact.</p>	<p>Climate change has the potential to impact high value landscapes through changing patterns of rainfall or sea level rise; population growth also has the potential to erode landscape quality. Green/ blue infrastructure may help address these issues where it is implemented.</p>
Climate Change Resilience	<p>Grey infrastructure, such as below ground storage, will provide wastewater storage for later treatment and release, supporting climate change resilience.</p> <p>The blue/ green approach will increase climate change resilience by slowing the flow of water, promoting natural flood risk reduction, supporting biodiversity in terms of habitats and their connectivity and in urban areas helping to counter the urban heat island effect. Given the extent of such infrastructure proposed through the DWMP, this could be a major positive effect.</p>	<p>The plan will support the wider move to increase resilience to climate change.</p>



8.0 MEASURES TO PREVENT, REDUCE AND AS FULLY AS POSSIBLE OFFSET ANY SIGNIFICANT ADVERSE EFFECT

8.1 MEASURES ADOPTED WITHIN THE DEVELOPMENT OF THE PLAN

This section outlines the key changes made to the plan to prevent, reduce, mitigate, and compensate for adverse effects on the environment, and to maximise beneficial effects. The SEA Regulations require the Environmental Report to include 'The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme'. Whilst the overall assessment of the plan (**Table 7.1.1**) does not identify any significant adverse effects (indicated by a 'red' score in the appraisal matrix), there is the opportunity as the plan is taken forward to prevent, reduce, mitigate, and compensate adverse effects and maximise the beneficial effects of the plan.

These should be noted within the wider context of the plan – the purpose of the plan is for YW, in partnership with others, to ensure the sustainability of drainage infrastructure and the services it provides to customers and the environment, to support economic growth and resilient communities, and to protect and enhance the environment.

The inclusion of wider social and environmental values (such as carbon, water quality, green space) within the optimizer tool (see Section 5.1), has integrated consideration of the wider benefits of the blue/ green infrastructure option within development of the plan.

Measures have been suggested throughout the SEA process and during revision of the draft DWMP in preparing the final plan.

The SEA of the draft DWMP included the following recommendations, progress of which is noted in italics:

- Consideration should be given to including costs in the optimiser tool associated with the increased wastewater treatment requirements that will arise as a result of the grey infrastructure approach, to reflect the increased treatment capacity required and increased operational costs. *YW are working to review the impact of increased flows from grey approaches to SO's. This will be incorporated in future cycles of the DWMP and reviewed on specific schemes in AMP8 and has been incorporated for a number of solutions where advanced modelling work has enabled this approach.*
- Given the adaptive planning approach taken by the draft DWMP24, it is recommended that the framework setting out how decisions will be made as the plan is implemented, is reviewed to consider how wider environmental issues are incorporated within the triggers and pathways used to evaluate progress and determine future interventions. *The final DWMP24 includes adaptive pathways to enable the development of strategies in the context of different future scenarios relating to climate change and growth and will be reviewed as schemes progress into the asset management lifecycle.*
- YW recognise the need to undertake further work ahead of the final DWMP24 due in March 2023 in line with the Storm Overflow Discharge Reduction Plan which will be confirmed by 1st



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

September 2022. This will determine the long-term delivery strategy for storm overflows in line with the DEFRA guidance, including priority overflows, designated bathing waters (including the recent inland bathing designation at Ilkley) and screening of storm overflows. *The final DWMP24 has incorporated all storm overflow assets within its plan and the requirements of the SODRP targets and guidance as is currently issued.*

- The modelled costs, benefits and hydraulic performance of the blue/ green infrastructure approach should be kept under review and refined as appropriate as experience of such measures grows. It may be appropriate to undertake pilot schemes in partnership with others (including universities/researchers) to inform the development and implementation of this approach within AMP8; and its assessment within subsequent DWMPs. *Several partnership schemes are already delivering benefits in AMP7, including:*
 - *The Living with Water (LWW) partnership commenced work in 2023 on its first collaboratively designed and delivered scheme as part of the blue-green plan for dense urban areas in Hull;*
 - *A new partnership is currently being formed for Doncaster, Immingham and Grimsby (DIG) which includes SuDS and sewer monitoring to reduce sewer flooding;*
 - *The Growing Resilience project in the Calderdale area focusing on habitat creation and restoration in upland areas to slow the flow of water, delivered between 2019-2021.*
 - *The Landscapes for Water and Catchment Partnerships (CaBA) which includes numerous catchment based solutions incorporating nature based solutions such as habitat restoration, woodland creation, natural flood management and upland restoration across some including to 5,500 hectares of YW/National Trust land in the South Pennines.*

YW will look to build on these as a platform for partnership working in AMP8 and beyond, embedding this approach and learning from existing partnerships.

- As experience and knowledge of the performance of the blue/ green infrastructure approach grows, its adoption within AMP8 should be increased where feasible within drainage communities as part of the solution (thus reducing the storage volume and subsequent water treatment as well as providing wider benefits). *The final DWMP24 includes an increasing uptake of this approach through the delivery phase, supported by the adaptive planning approach and application of a company ambition for delivery of blue-green solutions for storm overflows.*
- YW and wider partners should continue joint working with momentum, which is essential to implement the blue/ green infrastructure approach which can achieve wider social and environmental benefits beyond those directly associated with overflows, flood risk and WwTW compliance. *See above for current partnership working which relates to Yorkshire Water's performance commitment Working with Others.*
- Information developed through the plan making stage should be shared where this may assist and influence other stakeholders (e.g., planning authorities, developers, LLFA), particularly



where this could influence wider stakeholders. *This remains a valid recommendation once as solutions are progressed into the asset management lifecycle they will be supported by partnership working where practicable.*

- Within subsequent DWMP24 cycles, consideration should be given to the potential to include consideration of catchment level nutrient management. *There is currently one designated 'nutrient advice area' within the Yorkshire Water region, the Hornsea Mere. Yorkshire Water do not have any impact to Hornsea Mere however are committed to continue to work to the latest designations in respect of potential nutrient neutrality risks.*

Other key changes made since the draft DWMP, informed in part by the SEA process, include:

- Selection of the Preferred Plan which includes achievement of SODRP targets through a 20% blue-green approach in AMP8, increasing to 50% thereafter.

8.2 PROJECT STAGE IMPLEMENTATION

8.2.1 Recommendations

As the plan is taken forward, further measures will be required to prevent, reduce, mitigate, and compensate adverse effects and maximise the beneficial effects of the plan. These are set out in **Table 8.1.1** below.

Given the adaptive planning approach taken by the DWMP24, it is recommended that the framework setting out how decisions will be made, is reviewed to consider how wider environmental issues are incorporated within the triggers and pathways used to evaluate progress and determine future interventions.

Table 8.1.1 – Measures to prevent, reduce, mitigate, and compensate effects

Option Type	Measures to prevent, reduce, mitigate, compensate
Impermeable area surface water management - SuDS	<p>Opportunities to increase the uptake of this option should be maximised as the plan progresses (see the comment regarding the adaptive planning approach in the paragraph below).</p> <p>Along with water management, blue/ green infrastructure should be designed to achieve multi-functional benefits, including active travel routes (footpaths, cycle paths), recreation, biodiversity, landscape/ townscape, and reducing the urban heat island effect. Connectivity of this infrastructure within the wider environment should also be considered, including in terms of habitat networks and access routes.</p> <p>Blue/ green corridors should be designed and implemented following SuDS guidance, including in relation to pollution control and discharge to watercourses and groundwater.</p> <p>Opportunities for partnership working should continue to be identified and implemented. Early and effective partnership working is essential for implementation of this option.</p> <p>As implementation of this option progresses, consideration should be given to extending its use to upstream, rural areas, particularly where this may provide opportunities to help address the flash flood risk that results from the steep topography. Whilst increased long-term climate resilience may offer habitat and</p>



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

Option Type	Measures to prevent, reduce, mitigate, compensate
	<p>socio-economic benefits in the longer-term, careful consideration is required of the impact of changes made, and case-by-case consideration of the impact of drainage changes on habitats and land uses, including:</p> <ul style="list-style-type: none"> • the social and economic implications, such as to farming practices; and • habitat impacts (both positive and negative), particularly for the most important habitats such as SACs, Ramsar sites and SSSIs.
<p>Network Storage</p>	<p>Where possible, opportunities should be taken to reduce the extent of grey infrastructure (such as storage tanks) through the use of a hybrid solution (such as, in conjunction with, SuDS features, modification of upstream watercourses, rain gardens, etc.). Such an approach would provide the opportunity for wider enhancements, such as for biodiversity.</p> <p>Grey infrastructure should be designed in a manner which slows the flow of water to the receiving environment.</p> <p>Where water quality allows and where feasible, promote discharge from grey infrastructure containing surface water to waterbodies in preference to sewer. For larger schemes, undertake flood risk modelling of the proposed discharge of surface water flows to determine level of flood risk. Should fluvial flood risk reduction measures be required, they should be costed into this option and their associated environmental effects considered.</p> <p>Further catchment specific assessments are required to identify the most appropriate location or routing, design and construction methods for grey infrastructure. Cost and programme allowance should include for this, including issues such as ecology, heritage, consenting (e.g., discharge consents) and traffic management. The nature of constraints/ impacts will vary on a catchment-by-catchment basis. For example, a number of the catchments have high historic value and will require greater specialist heritage input; particular care is required within areas of high biodiversity value, in particular for certain ecological designations where, as a minimum, HRA screening will be required.</p> <p>Reducing the extent of grey infrastructure through use as part of a hybrid solution provides the greatest opportunity to minimise resource use, including carbon. Some further reduction in resource use is likely to be able to be achieved within construction through design optimisation, such as materials selection.</p> <p>Given storage will typically be an end-of-pipe solution, the new infrastructure will often be sited near to watercourses. Careful consideration of pollution control will be required during construction. Consenting requirements should be reviewed, such as a Flood Risk Activity Permit for works close to watercourses.</p> <p>Siting of storage should also consider efficient use of land (such as optimising reuse of previously developed land). Given the sterilization of land from further development, development policies and context (as established through Local Development Plans) should also be considered.</p> <p>Opportunities should be sought to provide wider benefits for the land during post construction reinstatement, in keeping with the landscape setting. This may include habitats, recreational access, and/ or amenity value.</p>
<p>WwTW upgrade</p>	<p>Consideration should be given to project specific environmental effects, including but not limited to:</p> <ul style="list-style-type: none"> • The nature of the site and any sensitive receptors (e.g., terrestrial, and aquatic biodiversity, heritage, archaeology, landscape, local land uses sensitivity to odour and noise) • Effluent discharge requirements • Changes to the fluvial flood risk as a result of increased discharges



Option Type	Measures to prevent, reduce, mitigate, compensate
	<ul style="list-style-type: none"> Seeking opportunities to reduce resource use during construction, increase efficiency in operation, increase effectiveness of treatment.

8.2.2 Project Controls

The Partnership for Yorkshire (P4Y) is YWs capital delivery partnership, which consists of over 60 different organisations working collaboratively to optioneer, design and deliver the best value solutions. P4Y includes the Asset Planning teams who work closely with the technical experts in P4Y, from Gate 2 onwards, to investigate all the options for meeting a desired outcome. The P4Y Project Lifecycle is a project control and governance process based on Association of Project Management (APM) best practice. The Project Manager is accountable for taking the project through this process and they report to the Project Sponsor (Asset Planning) who is accountable for ensuring the project delivers the expected benefits. It enables effective planning, management and control of a project from concept through to completion.

The DWMP outputs are part of the concept phase and the Strategic Planning team work closely with Asset Planning to move the outputs of the DWMP from generic through to unconstrained.

The Project Lifecycle has 5 stages:

- Concept Phase
- Definition Phase
- Delivery Phase
- Handover and Closure Phase
- Benefits Realisation.

Solutions will go through a series of Gates (go/no go decisions) and Key Meetings as part of this process. The Project Lifecycle includes optioneering of solutions and multiple technical and benefits reviews, as well as assurance against the design standards. Each Gate and Key Meeting has a specific list of documents required for review that cover all parts of the project, for example, Biodiversity, Environmental Permits, CDM Regulations, Planning, Requirements and Design Specifications. This includes project level environmental screening at the site-specific level, including identification of local constraints and opportunities, any permitting/consents and consultations with stakeholders required.

A key element of the Project Lifecycle is to evaluate options that deliver reductions in embedded and operational carbon emissions. whole life carbon assessments will be undertaken aligned to PAS2080:2016 and have been using a TOTEX hierarchy of no build, low build, nature-based solutions and grey solutions with lower carbon concrete or other low carbon materials or construction methods to achieve the target reductions. Options are modelled using decision making tool with data drawing on material quantities and associated emissions using the Bath ICEv2 (Bath University – Inventory of Carbon Emissions.) We follow this through the life of projects and use data at key gateways from design through to practical completion to refine and reduce carbon as far as possible.

As part of this process, consideration shall be given to the need to undertake the following project level assessments:



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

- Habitats Regulations Assessment
- Invasive Non-Native Species (INNS) Risk Assessment
- Water Framework Directive (WFD) Assessment
- Biodiversity Net Gain Assessment

8.2.3 Habitats Regulations Assessment

Appropriate siting of options within catchments is key to avoiding impacts to the national site network i.e., not siting options within European Sites or within 500-1000m of any European Sites

Importantly, another full HRA including stage 1 screening and stage 2 appropriate assessment where appropriate will be conducted on each L3 catchment at project level when more information is available. When implementing the DWMP, the following needs to be completed:

1. Using Appendix B of the plan level HRA report, and the DWMP, identify individual L3 catchments which have been screened out from further assessment and mitigation measures.
2. L3 catchments identified as requiring mitigation (dependent on option) and appropriate assessment must have the recommended mitigations included in the plan taken forward, or a detailed enough location provided to ensure significant distance from the nearby national site.

8.2.4 Invasive Non-Native Species (INNS) Risk Assessment

Further site-specific assessment will be required during implementation of the plan where INNS are present or pose a risk.

8.2.5 Water Framework Directive (WFD) Assessment

WFD Assessments could be required during implementation of the plan in relation to specific schemes that emerge from it where for example:

- a flood risk activity permit is required for certain activities on an Environment Agency Main River; or
- the activity could affect a water body that is at high status.

Further review of the need for WFD Assessments should be undertaken as the plan is implemented.

8.2.6 Biodiversity Net Gain Assessment

More detailed consideration of the achievement of biodiversity net gain is required during the implementation of the plan. Whilst the statutory requirements of the Environment Act will only apply to projects requiring planning permission, the NERC Act duty to 'enhance' biodiversity also applies.

8.3 RECOMMENDATIONS FOR SUBSEQUENT DWMP CYLCES

The following measures are recommended for further consideration during subsequent DWMP cycles:



DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP24): ENVIRONMENTAL REPORT

- Review and analysis of the outcomes of the blue-green approach, compared to the predicted costs, benefits and hydraulic performance, thus increasing certainty in future cycles as experience grows.
- YW and wider partners should continue joint working with momentum, which is essential to implement the surface water separation and removal schemes which can achieve wider social and environmental benefits beyond those directly associated with overflows, flood risk and WwTW compliance.
- Information developed through the plan making stage and implementation stage should be shared where this may assist and influence other stakeholders (e.g., planning authorities, developers, LLFA). For example, the plan has developed new data to identify the area of impermeable runoff that would need to be removed from the combined sewer network to achieve the ambitious target of zero internal flooding. This could influence wider stakeholders who could work to help achieve this.
- Within subsequent DWMP cycles, consideration should be given to the potential to include consideration of catchment level nutrient management considering the impact of drainage changes on habitats and land uses, including:
 - the social and economic implications, such as to farming practices
 - habitat impacts (both positive and negative), particularly for the most important habitats within Special Protection Areas, SACs, Ramsar sites and SSSIs
 - landscape impact (refer to the locally prepared Landscape Character Assessments for local landscape features, quality, forces for change and strategy)

Whilst increased long-term climate resilience may offer habitat and socio-economic benefits in the longer-term, careful consideration is required of the impact of changes made.



9.0 MONITORING THE SIGNIFICANT EFFECTS OF THE PLAN

The SEA Regulations require the environmental report to include:

“A description of the measures envisaged concerning monitoring in accordance with regulation 17”.
SEA Regulations, Schedule 2 (9)

A final stage of the SEA process is Stage E - Monitoring the significant effects of the implementation of the plan with the purpose of identifying unforeseen adverse effects at an early stage and being able to undertake appropriate remedial action. In line with regulation 17 of the SEA Regulations, monitoring is only required for significant environmental effects and may comprise or include monitoring undertaken for other purposes – monitoring of all topic areas is not required.

9.1 PROPOSED MONITORING

At this stage, it is only necessary (and appropriate) to set out the measures envisaged concerning monitoring. **Table 9.1.1** below provides a summary of the proposed monitoring parameters for the implementation of the preferred plan across the plan area and the plan period. This is based on the current understanding of the DWMP24 context within the region at present, with consideration of future baseline trends. The monitoring will also inform the adaptive planning process. These proposals will be kept under review and developed further as the DWMP24 progresses and in consultation with the statutory consultees, and other applicable stakeholders. This may include expansion of the proposals to agree the appropriate scale and duration of any monitoring activities proportional to the plan and the environmental risks. Once the plan develops into location/option specific projects, further monitoring requirements may arise, such as any requirements set out within any planning permissions or consents.

Given the extent of existing monitoring around the key topic areas, it is proposed that full use is made of existing and proposed monitoring arrangements and those required to be implemented through the DWMP, many of which are regulatory requirements. Monitoring required within the DWMP have been reviewed and been found to cover all the potential significant adverse effects (and benefits), as such no additional monitoring is proposed here. These are undertaken both by YW and other organisations such as the Environment Agency (e.g., water quality).



Table 9.1.1 – Proposed Monitoring Parameters

Proposed Monitoring Parameters	Source of Information (organisation undertaking monitoring or holding the data)
Water Quality Monitoring Data	<ul style="list-style-type: none"> • YW – DWMP includes provision for the installation of continuous water quality monitoring to assess any impact from storm overflows and wastewater treatment works discharge outlets by 2035 • EA – water quality monitoring of waterbodies
Flood Event Duration Monitoring	<ul style="list-style-type: none"> • YW – event duration monitors on all SOs where feasible by the end of 2023
Biodiversity	<ul style="list-style-type: none"> • YW – DWMP includes provision for the installation of continuous water quality monitoring to assess any impact from storm overflows and wastewater treatment works discharge outlets by 2035, which must include the ability to assess local ecological harm • YW - Biodiversity Net Gain for schemes requiring planning permission
Carbon emissions (Including the quantity of greenhouse gas emission per megalitre of water supplied, Energy use used in the operation of options, Renewable energy generated of purchased)	<ul style="list-style-type: none"> • YW reporting to Ofwat in line with Ofwat requirements

Assessment of monitoring results and any remedial action required should be undertaken by YW through the DWMP implementation and collated for use within the SEA for the adaptive planning process and in subsequent DWMP cycles.



APPENDICES

Appendix Subtitle



Appendix A **CONSULTEE COMMENTS**



Table A.1 Scoping Report SEA consultation responses

SEA Consultation Body	Comment	Response
<p>Natural England</p>	<p><u>3.1 Review of related plans, programmes, and objectives (also Appendix A)</u></p> <p>Reference should be made to the National Chalk Stream Strategy, hosted via CaBA Chalk Stream Strategy - CaBA (catchmentbasedapproach.org). The CSS makes specific reference to Water Quality – Reducing Pollution in Section 5. Reference should also be made to the CSS in Section 4.2.5 of the SEA Scoping Report – Water Resources.</p> <p>Appendix A should include reference to EA/NE SSSI Diffuse Water Pollution Plans (DWPPs) (e.g., River Derwent SSSI/SAC, Hornsea Mere SSSI/SPA and Malham Tarn SSSI/SAC). DWPPs can be supplied by the EA or Natural England on request.</p> <p>Reference should also be made to EA/NE SSSI River Restoration Plans (RRPs) – River Derwent SSSI/SAC, River Hull Headwaters SSSI and River Wharfe SSSI). RRs and associated technical documents can be accessed via the River Restoration Centre Website. Designated Rivers The RRC</p> <p>Common Standards Monitoring Guidelines for key freshwater SSSIs should also be considered and their water quality targets. CSMGs can be found via the Designated Sites View System Site Search.</p>	<p>Reference to the National Chalk Stream Strategy has been included in Appendix A (renamed as Appendix B of the SEA report).</p> <p>Reference to EA/NE SSSI Diffuse Water Pollution Plans (DWPPs) has been included Appendix A (renamed as Appendix B of the SEA report).</p> <p>Reference to EA/NE SSSI River Restoration Plans (DWPPs) has been included in Appendix A (renamed as Appendix B of the SEA report).</p> <p>Reference to common standards monitoring guidelines has been included in Appendix A (renamed as Appendix B of the SEA report).</p>

SEA Consultation Body	Comment	Response
	<p><u>4.2.7 Geodiversity</u></p> <p>This section could be renamed Soils and Geodiversity to aid navigation within the report.</p> <p>Cross reference should be made to SSSIs specifically designated for geological interest/ those which includes geological notified features alongside biological ones. Regionally Important Geological Sites should be mentioned.</p>	<p>The geodiversity SEA objective was found to fit well as part of the biodiversity SEA objective. Hence, Biodiversity and Geodiversity SEA objectives have been combined together.</p> <p>Nevertheless, SSSI's have been differentiated amongst, Geological, Biological and Mixed in Appendix C of the SEA report.</p> <p>RIGS, and similar local geological sites, have been included in Appendix C of the SEA report.</p>
	<p><u>4.2.9 Landscape</u></p> <p>Reference should be made to the proposed designation of the Yorkshire Wolds AONB. This is a live process but is likely to be designated during the DWMP period.</p>	<p>Thanks for drawing our attention to this AONB, reference has been included in Appendix B of the Final SEA report.</p>
	<p><u>5.1 Issues and Opportunities Summary Table – Table 6</u></p> <p><i>Biodiversity Opportunities</i></p> <p>Consideration could be given to the potential to support a project called Biomass Biodiversity which looked at the potential for the use of cut semi natural vegetation from conservation sites and projects as a feedstock for Anaerobic Digestion. Lab based trials have been undertaken with the Bio-Renewables Development Centre (University of</p>	<p>Since biomass biodiversity falls outside the scope of drainage and wastewater management, this suggestion has been forwarded to the YW Innovation Team for consideration if this can be considered as an innovation style project through YW Innovation Team.</p> <p>Bioeconomy represents a major economic opportunity for the UK and particularly for the North of England,</p>

SEA Consultation Body	Comment	Response
	<p>York) in Partnership with Natural England, including testing of sewage sludge as an inoculant. The full report is available on request. (THYME-Case-Study-2-A4-2pp1.pdf (biovale.org))</p>	<p>which has world-class bioeconomy assets. (Thyme – Teesside, Hull and York – Mobilising Bioeconomy Knowledge Exchange (biovale.org))</p>
	<p><u>5.1 Issues and Opportunities Summary Table – Table 6</u></p> <p><i>Water Resources Opportunities</i></p> <p>Common Standards Monitoring Guidelines for key freshwater SSSIs should also be considered and their water quality targets. CSMGs can be found via the Designated Sites View System Site Search (naturalengland.org.uk)</p> <p>Include in 6th bullet “improve water quality in all water bodies to meet WFD targets and designated site targets (for water quality and flow), as outlined in SSSI Definitions of Favourable Conservation Status.”</p>	<p>Text has been included in Table 3.2.1 of the Final SEA report.</p> <p>Text has been included in Table 3.2.1 of the Final SEA report</p>
<p>Environment Agency</p>	<p><u>Groundwater</u></p> <p>There’s no mention of safeguard zones for nitrate, although these would be at specific risk from sewer leakage increasing nitrate loading. Safeguard zones are a recognised mechanism to prevent rising trends in nitrate at drinking water sources.</p> <p>There is no mention of deep soakaways. These aren’t constructed by YW, but could their strategy/plan be used to reduce the risk of these happening? There is an increased risk of these structures in certain</p>	<p>Reference to nitrate safeguard zones has been included in Table 3.2.1 of the Final SEA report. Whilst specific scheme locations are not being considered at the current time, the safeguard zones mechanism will be taken into account as part of the next phase of programme prioritisation, in which specific locations will be considered as part of scheme production.</p> <p>As the DWMP would help address drainage issues, there is potential to reduce the construction of deep soakaways by others in certain zones where there is</p>

SEA Consultation Body	Comment	Response
	<p>zones where there is limited sewer capacity and low permeability glacial drift is present.</p> <p>Is there any consideration of the ongoing risks of unsewered areas in source protection zones? We are aware of some unsewered locations in source protections (and sometimes safeguard zones) e.g. Cottingham – non mains drainage here should be a priority to prevent deterioration of groundwater quality at public drinking water sources.</p> <p>All these things require a joined-up approach between the sewerage/drainage function and the groundwater abstraction functions of Yorkshire Water. Where there is conflict at this strategic level consideration is needed of the cross-over of these aspects of the business.</p>	<p>limited sewer capacity and low permeability glacial drift is present. This has been mentioned in the opportunity of Table 3.2.1 of the Final SEA report</p> <p>The DWMP would deal with the flooding issue in strategic level. It may help to reduce flooding risk in source protection zones through catchment management initiatives, if application. For some unsewered locations in source protection (e.g Cottingham – non mains drainage), YW Water will further investigate this issue in project levels.</p> <p>Noted. YW acknowledges the need to a joined-up approach between the sewerage/drainage function and the groundwater abstraction functions and endeavours to work collaboratively on this issue.</p>
	<p><u>Section 4.1</u></p> <p>This section outlines the SEA topics which have been proposed. I assume from this, it means these have been 'scoped in'. I think there needs to be some reference/clarity on what is scoped in and what is scoped out, with some rationale as to why these decisions have been made. There is no reference here to air quality. It's fine if the decision has been made to scope this out, but I think this needs to be noted. It states in section 1.2 that section 5 identifies whether environmental topics should be scoped in or out, but having reviewed Section 5, it doesn't make this particularly clear and instead just runs through the issues and opportunities.</p>	<p>All the SEA topics in Schedule 2 of the SEA regulation have been scoped in. For the sake of simplicity and easy presentation, some topics are grouped together according to their similar nature. Air quality and waste were grouped under the Carbon & Material Assets. Population was grouped under the human health. Fauna, flora and soil grouped under the Biodiversity and Geodiversity. A new topic on socio-economic was included to reflect the social and economical impact.</p>

SEA Consultation Body	Comment	Response
	<p><u>Section 7.2</u> - Worth including examples of what will/could constitute a significant effect? It would be good to get a better understanding in the scoping of how significance is going to be assessed.</p> <p>Will there be consideration of reasonable alternatives/opportunities to mitigate the negative effects, or enhance further the positive effects? How will this be done?</p>	<p>Noted. The significance criteria have been included in Section 4.2 of the SEA report. In the SEA report, the overall assessment of the plan does not identify any significant adverse effects (indicated by a 'red' score in the appraisal matrix). Nevertheless, there is the opportunity as the plan is taken forward to prevent, reduce, mitigate, and compensate adverse effects and maximise the beneficial effects of the plan. These further measures have been proposed in Table 7.1.1 of the SEA report.</p>
<p>Historic England</p>	<p>In terms of the historic environment, on the whole, we consider that the Report has identified the plans and programmes which are of relevance to the development of the DWMP, that it has established an appropriate Baseline against which to assess the Plan's proposals and that it has put forward a suitable set of Objectives and Indicators. Overall, therefore, we believe that it provides the basis for the development of an appropriate framework for assessing the significant effects which this plan might have upon the historic environment. However, there are a few aspects of the Report where we consider that some amendments are necessary, as below.</p>	<p>Noted with thanks.</p>
	<p><u>Page 10</u> - We would suggest the addition of a further key theme and message for the plan to consider/address along the following lines:</p> <ul style="list-style-type: none"> • Reduce the vulnerability and improve the resilience of heritage assets to flooding. 	<p>The theme in reducing the vulnerability and improving the resilience of heritages to flooding has been included in the SEA report.</p>

SEA Consultation Body	Comment	Response
	<p><u>Page 35</u> - We recommend that the first opportunity under the Heritage row of this table is amended to read as follows:</p> <ul style="list-style-type: none"> Assess, and avoid, minimise and/or mitigate as appropriate, any impacts to heritage assets. 	Noted. The recommendation has been included in Table 3.2.1 of the SEA report.
	<p><u>Appendix</u></p> <p>On the whole the review of plans, programmes and policies set out at Appendix 1 provides comprehensive coverage of relevant documents. However, we would suggest that consideration should be given as to whether the review should also cover the World Heritage Site Management Plans for Saltaire and Studley Royal Park.</p>	Noted. The review would cover the World Heritage Site Management Plans for Saltaire and Studley Royal Park. Appendix 1 (renamed as Appendix B of the SEA report) has been updated.

Table A.2 Draft DWMP SEA consultation responses

SEA Consultation Body	Comment	Response
Natural England	Only a screening Habitats Regulations Assessment (HRA) has been provided, a full HRA is required.	A full HRA report has been undertaken to inform the Final DWMP and has been published.
	A Strategic Environmental Assessment (SEA) has not yet been undertaken.	Please note that the draft SEA was conducted and submitted with the draft DWMP plan (the HRA was appended within the SEA). Please refer to the link below:

SEA Consultation Body	Comment	Response
		<p>https://www.yorkshirewater.com/strategic-environmental-assessment</p> <p>The SEA report has been finalised and published with the final DWMP.</p>
	<p>At present, it is not sufficiently clear if the draft plan and plan options will impact any designated sites.</p>	<p>Please note that the DWMP is a high-level strategic plan. The impact on any designated sites will be assessed in detail in detailed design. Nevertheless, strategic mitigation measures will be proposed in the HRA to prevent any potential impacts.</p>
	<p>The draft DWMP has not yet been assessed for the potential for net gain in biodiversity. At this stage, the draft DWMP cannot clearly show a result in a net gain in biodiversity.</p>	<p>As identified in section 9.2.3 of the draft SEA, the DWMP is a high-level strategic plan and as such the options are strategic in nature. At a strategic level, when considering options, we have incorporated biodiversity within our decision making through our 6 capitals investment models, which provide positive natural capital values for the change in outcomes provided by nature-based solutions. Whilst gathering a baseline over entire catchments is not proportionate or effective at this stage, Biodiversity Net Gain will be calculated at project level within the subsequent design stage and becomes a material factor in our option design cost benefit assessments. Biodiversity Net Gain is also considered within Table 6.3.2 of the draft SEA where it is noted that the two principal options provide the potential for biodiversity net gain during reinstatement (grey infrastructure), and the potential for long-term positive effects on biodiversity within blue-green infrastructure.</p>

SEA Consultation Body	Comment	Response
	<p>Both Natural Capital and Carbon Offsetting of the DWMP and plan options have not been assessed at this stage. Therefore, at this stage the draft DWMP cannot assess its potential to enhance natural capital.</p>	<p>The themes of natural capital and carbon reduction are integral through the SEA objectives and have been considered for this plan. The YW DMF (decision making framework) tool accounts for both natural capital and carbon within the option selection. The blue-green infrastructure approach is a nature-based solution which supports both these principles and is supported through the SEA.</p>
	<p>Natural England Area Team's invite Yorkshire Water to further conversations regarding the identified deficiencies in the draft plan and further environmental assessment before the final plan is published.</p>	<p>YW are working with Natural England's area team to further discuss our SEA and HRA and links to their final plan.</p>
	<p>The plan should include references to the Diffuse Water Pollution Plans, including the River Derwent, Hornsea Mere and Malham Tarn which have been particularly impacted by high Phosphate levels from STW and agricultural sources. Options for improvement should include multi benefit approaches. Please see case study example below: Cromhall wetlands trial (wessexwater.co.uk)</p>	<p>When considering the conclusions of the referenced reports it is not apparent that YW owned assets are the cause, nor do they contribute to the issues identified at Malham or Hornsea. Work that was carried out has reduced the risk on the river Derwent as identified within the report. YW is happy to support multi-benefit approaches however this may not be a suitable option for these examples, but YW will continue to support diffuse water pollution plans where actions are applicable to YW. YW supports the use of nature-based solutions, providing multiple benefits.</p> <p>Outcomes of the Cromhall wetlands trial:</p> <ul style="list-style-type: none"> • Overall, it demonstrated the benefits of nature-based solutions

SEA Consultation Body	Comment	Response
		<ul style="list-style-type: none"> • It demonstrated that lower flows into the wetlands in summer provide for increased phosphorus reduction (i.e., supporting removal of surface water flows into constructed wetlands to improve water quality) • A recommendation for flexible permitting – an approach which could be of benefit to the DWMP. <p>These themes are being discussed within the SEA project team and will be referenced where appropriate within the report</p>
	<p>Nature-based Solutions should be incorporated to ensure the best possible outcome for the terrestrial and freshwater environment.</p>	<p>Noted. Nature-based solutions have been considered in our options such as SuDS, blue-green corridors and working in partnership to deliver these types of solution.</p>
	<p>Natural England understand the reasons why an HRA has not been completed at this stage. However, we want a clear plan for when, where and how an HRA and SEA will be completed for the DWMP.</p>	<p>The full HRA is now underway to inform the DWMP and will be submitted together with the final SEA and DWMP.</p>
	<p>We note some habitats, sites and environmental receptors have been recognised within Section 5 and 7 (SEA) and Section 2 in HRA. Programme outputs of the draft plan raised during stakeholder engagement. However, it is unclear if all relevant habitat sites and their interest features have been identified and/or acknowledged during this high-level strategic phase and how they have influenced the plan options, any appropriate mitigation, and required monitoring at the design stage.</p>	<p>The HRA screening report contains a full list of relevant sites and maps to show their locations in relation to the DWMP Level 3 sites. Mitigation measures have been listed for any potential impacts identified on sites.</p>

SEA Consultation Body	Comment	Response
	<p>During assessment, we would like to refer Yorkshire Water to all relevant sites' Conservation Objectives, Supplementary Advice to the Conservation Objectives (SACO's) and Monitoring Specifications. Furthermore, NE Area teams have updated water-related threats data in late 2021 and would encourage the latest data available are referenced during environmental assessment.</p>	<p>The majority of this data is referred to in the HRA, which was written in 2022 using the updated data. The full data available in SACO's has not been used as this is an unsuitable level of detail for the DWMP. Further clarity has been sought on this matter from Natural England.</p>
	<p>To assist the Habitats Regulation Assessment, we refer Yorkshire Water to Annex 2 - Section 2.1 Habitats Regulations Assessment and Duties to Habitats Sites, which can be found below.</p>	<p>This information has been considered where appropriate. Please note that the full HRA has been published as a separate standalone report alongside the final DWMP.</p>
	<p>Regulation 9 of the Conservation of Habitats and Species Regulations 2017 (S.I. 2017/1012) as amended (referred to as the Habitats Regulations) requires every competent authority, in the exercise of any of its functions, to have regard to the requirements of the Habitats Directive. This requirement includes restoring favourable conservation status.</p>	<p>We acknowledge this feedback and will incorporate where required.</p>
	<p>Regulation 10 places a duty on a competent authority, in exercising any function, to use all reasonable endeavours to avoid any pollution or deterioration of habitats of wild birds.</p>	<p>We acknowledge this feedback and will incorporate where required.</p>
	<p>In addition, regulation 63 places obligations on competent authorities in respect of plans or projects likely to have a significant effect on a protected site. The Government guidance now refers to sites covered by the provisions of the Habitats Regulations as 'Habitats sites' in line with the wording in the National Planning Policy Framework and we have followed that nomenclature throughout this letter. Note that for Marine Protected Areas that are also Habitats sites and Ramsar sites the legal tests are the</p>	<p>We acknowledge this feedback and will incorporate where required.</p>

SEA Consultation Body	Comment	Response
	<p>same as terrestrial/freshwater Habitats sites. In England, as a matter of policy, sites listed or proposed under the “Ramsar Convention on Wetlands of International Importance” receive the same level of protection as Habitats sites. The HRA should be clearly distinguishable document or section of the DWMP.</p>	
	<p>The HRA should include:</p> <ol style="list-style-type: none"> 1. A list and/or map of all relevant Habitats sites. 2. An appropriate assessment of the plan options unless, on the basis of objective information, a likely significant effect can be excluded by the screening of relevant Habitats sites. 3. The appropriate assessment must identify all relevant adverse effects on integrity and uncertainties. 4. All mitigation aimed at addressing likely significant effects or/and removing adverse effects must be covered within the appropriate assessment. 5. Any options with residual adverse effects identified or where adverse effects are uncertain must have assessments under Regulation 64 (to determine that there are no alternatives with less or no adverse effects and demonstrate Imperative Reasons of Overriding Public Interest). 6. All options with adverse effects must have secured compensatory habitat such that the coherence of the Habitats sites series is maintained. <p>The HRA of the plan should include an assessment of the in combination and cumulative impacts of the plan with other plans and projects. The HRA should have regards to relevant caselaw and should take account of whether the site is meeting its conservation objectives for relevant features and attributes to the dDWMP options.</p>	<p>Noted with thanks. These comments will be considered where appropriate.</p> <ol style="list-style-type: none"> 1. Already included in screening 2. Appropriate assessment is being written currently 3. We believe all relevant effects have been identified. 4. Mitigation is detailed in the screening and has been included in the full HRA 5. TBD depending on appropriate assessment. Unlikely that any will have residual adverse effects after mitigation. 6. As above

SEA Consultation Body	Comment	Response
	<p>The HRA of the plan should include an assessment of the in combination and cumulative impacts of the plan with other plans and projects. The HRA should have regards to relevant caselaw and should take account of whether the site is meeting its conservation objectives for relevant features and attributes to the dDWMP options.</p>	<p>Given that the DWMP is a high-level strategic plan, the cumulative impact has been assessed in a high-level descriptive manner</p>
<p>Environment Agency</p>	<p>The Strategic Environmental Assessment (SEA) is a high-level consideration of the potential effects of the plan and the options in the plan at Level 1: The outcome of the assessment of the options at the level of the whole study area (Level 1) is provided, with supporting narrative; however, the list of options assessed do not clearly match with the list of hierarchy of options (in Table 5.2.1) i.e. the first three options (observe, monitor, investigate) are not accounted for in the assessment tables (i.e Table 5.3.1 and 5.3.2). There are a greater number of options relating to 'enhance' in the assessment tables than that listed in the options table (Table 5.2.1). Therefore, it is unclear if all reasonable alternatives been considered</p>	<p>The naming and arrangement of some options were amended during the development of the draft DWMP.</p> <p>Within Table 5.2.1, the options relating to 'enhance' are grouped together into broad categories, such as 'additional network capacity; storage; separate flows'. As these may have differing environmental effects, these options are considered separately within Table 5.3.1 and Table 5.3.2 (where additional sewer network capacity, increased storage capacity, and separate flows are each considered). As such is it thought that all reasonable alternatives have been considered. However, the SEA is currently being reviewed to confirm this and to increase clarity and consistency between the SEA and the final DWMP.</p> <p>The second row in Table 5.3.2 states 'Observe, monitor and investigate options are not included in this table as they will not be assessed through SEA.' They were looked at in an earlier stage of the DWMP24 process, with only applicable Level 3 catchments moving forward in the process</p>

SEA Consultation Body	Comment	Response
	<p>Considerations of the options are also stated as being assessed at Level 2 (SPA) although these are also at quite high level and generic across the SPA being assessed. It is stated that Level 3 assessments were not undertaken as this would be 'unmanageable'. However, the report does note that the draft DWMP has identified 160 high priority L3 catchments where storm overflow and/or flood risk reduction measures are required; along with ten WwTWs where improvements are required, which could have been assessed; this shows inconsistencies between level of detail that is included in the draft DWMP and those options assessed in the SEA, highlighting the potentially limiting influence of the SEA on plan development. There is mention throughout to more detailed assessment being undertaken 'post SEA'; however, it is not clearly stated what this would comprise, when it would be carried out and who would be consulted (as a more detailed assessment of the baseline will be needed and a wider review of relevant plans, programmes and policies) and what influence this would have on plan finalisation to reduce environmental impact. Limited information is also included in relation to monitoring for SEA topics.</p>	<p>According to "Appendix F - Example contents of a drainage and wastewater management plan" of the DWMP Framework report, the SEA should be undertaken at a programme (L1) level only. Nonetheless, the SEA report has also included L2 SPA assessment, in which the L2 SPA is an aggregation of L3 units.</p> <p>In addition, as set out in Table 5.1.1 of the SEA, more detailed consideration of key environmental issues within each catchment has been undertaken as an integral part of the DWMP development to prioritise catchments for action. As part of this, the optimiser tool takes into account the natural capital approach when determining the option to be taken forward for each catchment.</p> <p>Yorkshire Water have established environmental control procedures for the design and construction of their assets which will be in place when the measures identified in the DWMP are implemented. This includes more detailed consideration of the baseline environment and requirements. A section will be added to the final SEA to expand on this and provide greater clarity.</p>
Historic England	<p>A.1.2 Stages of the SEA and consultation. The second paragraph refers to English Heritage, not Historic England.</p>	<p>This typographical error has now been corrected.</p>
	<p>Appendix B – Review of relevant plans, programmes and environmental protection objectives. Under the 'National' sub-heading it would be prudent to add the following guidance:</p>	<p>We will include this point within the final SEA report.</p>

Summary of SEA Scoping Consultee Responses

SEA Consultation Body	Comment	Response
	<p>1) 'Managing Significance in Decision-taking in the Historic Environment: Historic Environment Good Practice Advice in Planning: 2' (https://historicengland.org.uk/imagesbooks/publications/gpa2-managing-significance-in-decision-taking/).</p> <p>2) 'Preserving Archaeological Remains: Decision-taking for Sites under Development' (https://historicengland.org.uk/images-books/publications/preserving-archaeologicalremains/).</p>	
	<p>Appendix C – Environmental baseline, 1.7 Heritage The final paragraph states that 'Other historical sites may be designated under categories not set out above and heritage advise should be sought (local authorities, county archaeologists, etc.) for future specific optioneering and any subsequent planning requirements.' This statement conflates things like conservation areas, non-designated assets (including those identified on local lists where they exist) and other local designations. It would be helpful if these 'other' types of designation were separated out and elaborated upon.</p>	<p>We will update the final SEA report and include greater clarity of the types of 'other' sites mentioned.</p>
	<p>Various locations in a couple of places (e.g. Table 3.2.1 – Issues and opportunities summary table & Appendix C – Environmental baseline: 1.7 Heritage) reference is made to setting in relation to historic buildings or structures, but it is important to acknowledge that the need to consider setting also applies to below-ground archaeological remains.</p>	<p>Reference will be made, where appropriate, to archaeological setting both above and below ground.</p>
	<p>General comment Organic-rich deposits, both archaeological and 'natural' (alluvium, peat, etc.), can include organic artefacts (wood, leather, etc.) and paleoenvironmental indicators / proxies (macroscopic plant remains, pollen, etc.), generally resulting from waterlogged anoxic conditions,</p>	<p>We will include this text in the final SEA report.</p>

SEA Consultation Body	Comment	Response
	which are particularly sensitive to any hydrological and geochemical changes to their burial environments.	
	<p>The Drainage and Wastewater Management Plan is of particular interest to Historic England for the following reasons:</p> <p>1. The vulnerability of most heritage assets (designated and non-designated) to flooding, including occasional flooding, and the potential harm to, or loss of, significance as a result of changes to water catchment areas;</p>	<p>The text in the final SEA plan will be checked to ensure coverage of these issues where applicable to the DWMP.</p>
	<p>2. The potential impact of water catchment and abstraction measures on heritage assets and their settings, including impacts on water-related or water dependent heritage assets;</p>	<p>The text in the final SEA plan will be checked to ensure coverage of these issues where applicable to the DWMP.</p>
	<p>3. The potential impact of changes in groundwater flows and chemistry on preserved organic and paleoenvironmental remains: where ground water levels are lowered as a result of measures to reduce flood risk, this may result in the possible degradation of remains through de-watering, whilst increasing groundwater levels and the effects of re-wetting/ changes in salinity brought about by coastline modification could also be harmful;</p>	<p>The text in the final SEA plan will be checked to ensure coverage of these issues where applicable to the DWMP.</p>
	<p>4. The potential impact of hydro-morphological adaptations on heritage assets: this can include the modification/removal of historic in-channel structures, such as weirs / coastal and estuarine features such as historic sea defences; as well as physical changes to rivers/the coastline with the potential to impact on archaeological and paleoenvironmental remains;</p>	<p>The text in the final SEA plan will be checked to ensure coverage of these issues where applicable to the DWMP.</p>

SEA Consultation Body	Comment	Response
	5. The potential for unrecorded deeply buried and waterlogged archaeology within the 'natural' floodplain/estuarine / coastal deposit sequence;	The text in the final SEA plan will be checked to ensure coverage of these issues where applicable to the DWMP.
	6. The potential implications of flood risk on securing a sustainable use for heritage assets, including their repair and maintenance;	The text in the final SEA plan will be checked to ensure coverage of these issues where applicable to the DWMP.
	7. The opportunities for conserving and enhancing heritage assets as part of an integrated approach to flood risk management and catchment-based initiatives, this includes sustaining and enhancing the local character and distinctiveness of historic townscapes and landscapes;	The text in the final SEA plan will be checked to ensure coverage of these issues where applicable to the DWMP.
	8. The opportunity for increasing public awareness and understanding of appropriate responses for heritage assets in dealing with the effects of flooding as well as the design of measures for managing flood risk and improving resilience;	The text in the final SEA plan will be checked to ensure coverage of these issues where applicable to the DWMP.
	9. The opportunities for improving access, understanding or enjoyment of the historic environment and heritage assets as part of the design and implementation of flood risk management measures.	The text in the final SEA plan will be checked to ensure coverage of these issues where applicable to the DWMP.
	Historic England advises Yorkshire Water to consider each of the above when drawing up plans, and during the detailed design stage for specific interventions, to inform an appropriate and positive response to the historic environment	Your concerns will be considered in the further development of the DWMP and in drawing up plans in detailed design stage for any schemes promoted through into our capital delivery teams.

**Appendix B REVIEW OF RELEVANT PLANS, PROGRAMMES
AND ENVIRONMENTAL PROTECTION
OBJECTIVES**



Appendix B - Review of Relevant Plans, Programmes and Environmental Protection Objectives

Policy or Plan	Summary of Guidance
International	
<i>Biodiversity</i>	
Bern Convention - Conservation of European Wildlife and Natural Habitats (1979)	Aims to conserve wild flora and fauna and natural habitats. Importance is placed on the need to protect endangered natural habitats and endangered vulnerable species.
Bonn Convention - Conservation of Migratory Species of Wild Animals (1983)	Aims to conserve terrestrial, aquatic, and avian migratory species through their range noting that species do not recognise borders.
Ramsar Convention - Wetlands of International Importance (1971)	Aims to conserve and wisely utilise wetlands through local and national actions to international cooperation. The Convention uses a broad definition for wetland: "lakes and rivers, swamps and marshes, wet grasslands and peatlands, oases, estuaries, deltas and tidal flats, near-shore marine areas, mangroves and coral reefs, and human-made sites such as fishponds, rice paddies, reservoirs, and salt pans".
United Nations (1992) Convention on Biological Diversity (1992)	The main objectives are conservation of biological diversity; sustainable use of its components; and fair and equitable sharing of benefits arising from genetic resources.
<i>Climate Change</i>	
UN Framework Convention on Climate Change (1992)	The stated objective is to: "achieve stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system".
UN Framework Convention on Climate Change/ Cancun Agreement (2011) Kyoto Protocol (1997)	The Cancun Agreements were a set of significant decisions by the international community to address the long-term challenge of climate change collectively and comprehensively over time, and to take concrete action immediately to speed up the global response to it. Kyoto commits its parties to limit climate change by setting internationally binding targets for emission reductions. It was adopted in 1997 and ratified in 2005.
World Summit on Sustainable Development (2002)	It commits nations to take a collective responsibility to build a human, equitable, and caring global society. The Declaration also reinforces the three pillars of sustainable development: environmental, economic, and social development at various levels.
The UNFCCC (United Nations Framework Convention on Climate Change) Glasgow/ COP26 Agreement (2021) Paris Agreement/ COP 21 (2015)	Mitigating and adapting to climate change is a critical policy consideration at an international level with multiple agreements in place to address the climate emergency. The UNFCCC is the forum for international action on climate change with the aim of stabilising GhG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. The UNFCCC focuses on mitigating (reducing) GhG emissions, adapting to climate change, reporting of national emissions, and financing of climate action in developing countries. Agreed at COP 21, the Paris Agreement commits signatories to reducing global greenhouse gas emissions with the long-term goal of withholding a temperature increase by no more than 2°C. The recent COP26 gathering in Glasgow led to the Glasgow Climate Pact, reaffirming the Paris Agreement goal of limiting the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit it to 1.5 °C. The pact recognises that GHG emissions need to fall by 45% by 2030 if the world is to stay on track to reach net zero by 2050 and requests countries revisit their 2030 targets by the end of 2022. In addition, the Cancun Adaptation Framework recognises that adaptation is required to be given the same priority as mitigation including reducing vulnerability and increasing resilience. Any major transport infrastructure development set out in the emerging RTS should contribute to meeting the requirements and targets set out in international climate change policies and agreements.
<i>Heritage</i>	
Charter for the Protection and Management of Archaeological Heritage (1990)	The Charter states that policies for the protection of archaeological heritage should constitute an integral component of policies relating to land use, development, and planning as well as of cultural, environmental, and educational policies. The charter should be supplemented at regional and national levels by guidelines for need.

The World Heritage Convention (1972)	The Convention defines what type of natural or cultural sites can be considered for the World Heritage List. It sets out the duties of countries in identifying potential sites and preserving them for the benefit of the world.
Overarching	
Aarhus Convention (1998)	The Aarhus Convention was created to give empowerment to citizens and civil society organisations in relation to environmental matters and is founded on the principles of participative democracy. It provides for access to environmental information; public participation in environmental decision making; and access to justice.
UN Agenda 2030	The Sustainable Development Goals (SDGs) are a collection of 17 interlinked global goals designed to be a "blueprint to achieve a better and more sustainable future for all". The SDGs were set up in 2015 by the UN General Assembly and are intended to be achieved by the year 2030. They are included in a UN Resolution called Agenda 2030. The SDGs were developed in the Post-2015 Development Agenda as the future global development framework to succeed the Millennium Development Goals which ended in 2015.
European	
Biodiversity	
Council Regulation No. 1100/2007: Establishing measures for the recovery of the stock of European eel (2007)	This EU Regulation was transposed into UK law under The Eels (England and Wales) Regulations 2009. Eleven Eel Management Plans have been prepared, one for each River Basin identified in England and Wales.
The Habitats Directive; also known as the Directive for the Conservation of Natural Habitats and of Wild Flora and Fauna (92/43/EEC) (1992)	The Habitats Directive promotes the maintenance of biodiversity. While the Directive contributes to sustainable development; it focusses to ensure the conservation of around 450 species of fauna and 500 species of flora. The Habitats Directive also establishes the EU wide Natura 2000 ecological network of protected areas, providing a high level of safeguards against potentially negative developments. Together with the Birds Directive, the Habitats Directive forms the backbone of European nature protection legislation.
Birds Directive (2009/147/EC) (2009) (79/409/EEC - as amended) (1979)	This Directive adds to the Habitats Directive and provides a framework for the conservation and management of, and human interactions with, wild birds in Europe.
EU Biodiversity Strategy for 2030 (2020)	The strategy aims to put Europe's biodiversity on a path to recovery by 2030 and contains specific actions and commitments. It is the proposal for the EU's contribution to the upcoming international negotiations on the global post-2020 biodiversity framework. A core part of the European Green Deal, it will also support a green recovery following the Covid-19 pandemic.
Climate Change	
Promotion of the use of energy and renewable sources Directive (2009/28/EC) (2009)	Directive 2009/28/EC on the promotion of the use of energy from renewable sources set binding targets for the share of renewable energy sources in the final energy consumption for each EU country.
Air Quality	
Ambient Air Quality Directive (2008/50/EC) (2008)	Sets limits for key pollutants in the air we breathe outdoors. These legally binding limit values are for concentrations of major air pollutants that impact public health.
Heritage	
The Convention for the Protection of the Architectural Heritage of Europe (Granada Convention) (1985) Revised European Convention on the Protection of Archaeological Heritage (Valletta Convention/ Malta Treaty) (1992)	The Valletta Convention is an international legally binding treaty within Europe. It places the revised Convention in the framework of activities concerning the cultural heritage since the European Cultural Convention came into force. It deals with the protection, preservation, and scientific research of archaeological heritage. In particular, the revised Convention focuses on the problem of conservation of archaeological heritage in the face of development projects.
Landscape	
The European Landscape Convention (Florence Convention) (2004)	Aims to promote the protection, management and planning of all European landscapes and organises co-operation on landscape issues and raises awareness

	of living landscapes. The UK Government signed the European Landscape Convention becoming binding from March 2007.
Resource Use	
Soil Thematic Strategy (2006)	The Strategy aims to protect soil and promote sustainable use. It aims to prevent further soil degradation and restore degraded soils to a level of functionality consistent at least with current and intended use.
Water Resources	
The Nitrates Directive (91/676/EEC) (1991)	It aims to protect water quality by preventing nitrates from agricultural sources polluting ground and surface waters. Also, to promote the use of good farming practices. This Directive forms integral part of the WFD and is one of the key instruments to protect waters from agricultural pressures.
Directive on Bathing Water (2006/7/EC)	The overall objective of the Directive remains the protection of public health whilst bathing. The revised Directive also offers an opportunity to improve management practices at bathing waters; to standardise the information provided to bathers; aims to set more stringent water quality standards; and also puts a stronger emphasis on beach management.
Groundwater Directive (2006/118/EC) (2006)	This directive establishes a regime which sets underground water quality standards and introduces measures to prevent or limit inputs of pollutants into groundwater, including assessments on chemical status and the reversal of significant pollutant concentrations. The directive accompanies the WFD which requires pollution trend studies to be carried out and for trends to be reversed so that environmental objectives are achieved by 2015. It also requires reviews of technical provisions to be carried out from 2013 and every six years after.
The Water Framework Directive (WFD) (2000/60/EC) (2000)	The WFD introduces a planning process to manage, protect and improve the water environment. It applies to all rivers (including drains and ditches), lakes, estuaries, coastal waters, and groundwater. All surface waters (including rivers, lakes, estuaries and stretches of coastal water) and groundwaters have been divided up into discrete units called water bodies. Water bodies are the basic unit that are used to assess the quality of the water environment and to establish targets for environmental improvement.
The Floods Directive (2007/60/EC) (2007)	This Directive provides an approach to managing flood risk on a catchment-wide scale. It is used in conjunction with the WFD.
Urban Wastewater Treatment Directive (91/271/EEC) (1991)	The objective of this Directive is to protect the environment from the adverse effects of urban wastewater discharges and discharges from certain industrial sectors, and concerns the collection, treatment, and discharge of wastewater.
Revised Drinking Water Directive (2020/2184) (2020) Drinking Water Directive (98/83/EC) (1998)	In 2020, the European Parliament formally adopted the revised Drinking Water Directive. The Directive will enter in force on 12 January 2021, and Member States will have two years to transpose it into national legislation. The Drinking Water Directive (Council Directive 98/83/EC) concerns the quality of water intended for human consumption. Its objective is to protect human health from adverse effects of any contamination of water intended for human consumption by ensuring that it is wholesome and clean.
Marine Strategy Framework Directive (2008/56/EEC) (2008)	The aim is to protect the marine environment across Europe. It aims to achieve good Environmental Status of EU marine waters by 2020 and to protect the resource base upon which marine-related economic and social activities depend.
Directive on the Assessment and Management of Flood Risks (2007/60/EC) (2007)	This Directive now requires an assessment of all watercourses and coastlines at risk from flooding, to map the flood extent and assets and humans at risk in these areas and to take adequate and coordinated measures to reduce this flood risk. The Directive applies to inland waters as well as all coastal waters.
Overarching	
Environmental Liability Directive (2004/35/EC) (2004)	This Directive focusses on enforcement of claims against occupational activities which damage the environment. Its objective is to create "a more uniform regime for the prevention and remediation of environmental damage".
Directive on the Assessment of the certain effects of plans and programmes on the environment (SEA) (2001/42/EC) (2001)	The SEA Directive sets out the requirements for assessment of certain plans and programmes on the environment. An SEA is mandatory for plans/programmes which are prepared for agriculture, forestry, fisheries, energy, industry, transport, waste/ water management, telecommunications, tourism, town and country planning or land use and which set the framework for future developmental consent of certain projects found in the EIA Directive.

National	
<i>Biodiversity</i>	
Salmon and Freshwater Fisheries Act 1975	The Act sets out the legal framework in which salmon and freshwater fisheries are regulated. Aims include attempting to protect salmon and trout from commercial poaching, protecting migration routes, prevent wilful vandalism and neglect of fisheries, ensure correct licensing, and water authority approval.
JNCC and Defra - UK Post-2010 Biodiversity Framework (2012)	The development of the Framework reflects a revised direction for nature conservation, towards an approach which aims to consider the management of the environment, and to acknowledge and consider the value of nature in decision-making. The Framework sets out the common purpose and shared priorities of the UK and the four countries, and, as such, is a hugely important document, which is to be owned, governed, and implemented by the four countries.
Making Space for Nature - A review of England's Wildlife Sites (2010)	The report makes key points for establishing a strong and connected natural environment: 1) that we better protect and manage our designated wildlife sites; 2) that we establish new Ecological Restoration Zones; and 3) that we better protect our non-designated wildlife sites. That Society's need to maintain water-quality, manage inland flooding, deal with coastal erosion, and enhance carbon storage, if thought about creatively, could help deliver a more effective ecological network.
Biodiversity 2020: A strategy for England's wildlife and ecosystem services (2011)	The Strategy sets out how the UK is implementing its commitments. The aim is to halt the decline of wildlife and ecosystems for the benefit of this and future generations.
The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations (2019) The Conservation of Habitats and Species Regulations (2017) and (2010) (as amended)	The 2019 amendment provides changes to the Habitats and Species Regulations which would no longer work when the UK leaves the EU. The Conservation of Habitats and Species Regulations 2010 apply in the terrestrial environment and in territorial waters out to 12 nautical miles. The objective of the Habitats Directive is to protect biodiversity through the conservation of natural habitats and species of wild fauna and flora. It lays down rules for the protection, management and exploitation of such habitats and species. The EU Habitats and Wild Birds Directives are transposed in UK offshore waters by separate regulations.
The Invasive Alien Species (Enforcement and Permitting) Order (2019)	Aims include to prevent and manage invasive alien fauna and flora in England and Wales only.
The Great Britain Invasive Non-Native Species Strategy, Defra (2015)	The aim of the Strategy is to address INNS issues in Great Britain by minimising the risk they pose and reducing their negative impacts.
Conservation 21: Natural England's Conservation Strategy for the 21st Century (2016)	The strategy's three guiding principles are to: create resilient landscapes and seas; put people at the heart of the environment; and grow natural capital.
<i>Climate Change</i>	
Energy Act (2013)	The Act focuses on setting decarbonisation targets for the UK and reforming the electricity market. It aims to maintain a stable electricity supply as coal-fired power stations are retired. This includes facilitating the building of a new set of nuclear power stations and the establishment of a new regulator, the Office for Nuclear Regulation.
Defra - UK Climate Change Risk Assessment 2017 (2017)	Highlights the key climate change risks/ opportunities for the UK. These are: flooding and coastal change; risks to health, well-being, and productivity from high temperatures; shortages in the public water supply for agriculture, energy generation and industry; risks to natural capital, soils and biodiversity; risks to domestic and international food production and trade; and pests, diseases, and invasive non-native species affecting people and the environment.
UK Climate Projections (UKCP) (2018)	The UKCP18 Projections provide a basis for studies of impacts and vulnerability and decisions on adaptation to climate change in the UK over the 21 st century. The Projections will allow planners and decision-makers to make adaptations to climate change.
Climate Change Act (2008) 2050 Target Amended Order (2019)	Sets a legal framework to commit towards tackling climate change and adaptation. The Act sets a target of net zero by 2050 based upon 1990 levels.

Heritage	
The Ancient Monuments and Archaeological Areas Act (1979)	An Act to consolidate and amend the law relating to ancient monuments; to make provision for the investigation, preservation and recording of matters of archaeological or historical interest and (in connection therewith) for the regulation of operations or activities affecting such matters.
Planning (Listed Buildings and Conservation Areas) Act (1990)	An Act of Parliament that altered the laws on granting of planning permission for building works, notably including those of the listed building system in England and Wales
Historic England - Strategic Environmental Assessment, Sustainability Appraisal, and the Historic Environment (2016)	Guidance for addressing the historic environment in Strategic Environmental Assessment or Sustainability Appraisal. It identifies the recommended list of plans, programmes and policies for review, approach to baseline review, potential sustainability issues.
Historic England - The Setting of Heritage Assets, Historic Environment Good Practice Advice in Planning 3, 2nd Edition (2017)	This sets out guidance, against the background of NPPF and the related guidance given in the PPG, on managing change within the settings of heritage assets, including archaeological remains and historic buildings, sites, areas, and landscapes.
Managing Significance in Decision-taking in the Historic Environment: Historic Environment	Good Practice Advice in Planning: 2' (https://historicengland.org.uk/images-books/publications/gpa2-managing-significance-in-decision-taking/).
'Preserving Archaeological Remains: Decision-taking for Sites under Development'	Decision making for stakeholders on projects where intention is to retain and protect archaeological sites beneath or within development.
Resource Use	
Our Waste, Our Resources: A Strategy for England (2018)	Sets out how to preserve the stock of material resources by moving towards a circular economy. Aims to minimise damage to the natural environment and is aligned to the Government's 25 Year Environment Plan. Includes a blueprint for eliminating avoidable plastic waste, doubling resource productivity, and eliminating avoidable waste of all types by 2050.
Soils and Geology	
Defra - Safeguarding our Soils - A strategy for England (2009)	The primary aim is that by 2030, all England's soils will be managed sustainably, and degradation threats tackled successfully.
Water Resources	
Water UK - DWMP Framework (2021)	Drainage and Wastewater Management Plans are the new way for organisations to work together to improve drainage and environmental water quality. The framework was commissioned by Water UK in collaboration with Defra, Welsh Government, Ofwat, Environment Agency, Natural Resources Wales, Consumer Council for Water, ADEPT, and Blueprint for Water.
Marine and Coastal Access Act (2009)	The Act sets out to protect marine functions, activities, and wildlife. It sets out the provisions for Marine Conservation Zones, planning decisions, and more.
National Flood and Coastal Erosion Risk Management Strategy for England (2020)	The strategy sets out a vision of a nation ready for, and resilient to, flooding and coastal change – today, tomorrow and to the year 2100. It sets out the long-term goal for resilience to future flood and coastal erosion, and therefore protects people, the environment, and the economy.
Flood and Coastal Erosion Risk Management Policy Statement (2020)	The National Flood and Coastal Erosion Strategy informs this policy statement. Five key areas for action include: upgrading and expanding our national flood defences and infrastructure; managing the flow of water more effectively; harnessing the power of nature to reduce flood and coastal erosion risk and achieve multiple benefits; better preparing our communities; and enabling more resilient places through a catchment-based approach.
Flood risk assessments: climate change allowances (2016, updated 2021)	The guidance is for developers and their agents preparing flood risk assessments for planning applications, amongst others. Making allowances for climate change in Flood Risk Assessment will help minimise vulnerability and provide resilience to flooding and coastal change.
Water Resources Act (WRA) (2009) Amended from WRA (1991)	The Act sets out the functions the Environment Agency and introduced water quality classifications and objectives for the first time. An Act of the Parliament that regulates water resources, water quality and pollution, and flood defence.
Water Industry Act (1991)	This Act sets out the main powers and duties of the water and sewerage companies and defined the powers of the Water Services Regulation Authority (Ofwat). Note this was amended by Section 36 of the Flood and Water Management Act 2010.

Water Act (2003) (as amended) Water Act (1991) (amended from)	The 2003 Act amends the Water Resources Act and Regulations 1991 and the Water Industry Act 1991. The Act has the following four broad aims: the sustainable use of water resources; strengthening the voice of consumers; and a measured increase in competition; and the promotion of water conservation.
Preparing for a drier future: England's water infrastructure needs (2018)	This document sets out the National Infrastructure Commission's advice on how to address England's water supply challenges and deliver the appropriate level of resilience for the long term.
Draft National Policy Statement for Water Resources Infrastructure (2018)	The draft National Policy Statement for Water Resources Infrastructure sets out the need and government's policies for the development of nationally significant infrastructure projects relevant to water resources in England.
Protect groundwater and prevent groundwater pollution (2017)	This guidance helps with permit or licence applications You must not cause groundwater pollution.
The Water Environment (Water Framework Directive) Regulations (2003) WFD implementation in England and Wales: new and updated standards to protect the water environment (2014)	The Water Environment Regulations transpose the WFD into UK law. They aim to protect and enhance the quality of surface fresh water (including lakes, streams, and rivers); groundwaters; groundwater dependant ecosystems; estuaries; and coastal waters (out to one mile). The UK Technical Advisory Group (UKTAG) is responsible for developing environmental standards and conditions for achieving WFD requirements for rivers and lakes.
The Environment Agency's approach to groundwater protection (2018)	This guidance is for planners, applicants for environmental permits and abstraction licences, and landowners concerned with the quality and quantity of groundwater.
CIRIA – SuDS Manual (2015)	The SuDS manual incorporates the latest technical advice and adaptable processes to assist in the planning, design, construction, management and maintenance of good SuDS. In delivering SuDS there is a requirement to meet the framework set out by the Government's 'non statutory technical standards' and the revised SuDS Manual complements these but goes further to support.
Water UK - Net Zero 2030 Roadmap (2020)	In 2020, water companies unveiled a plan to deliver a net zero water supply for customers by 2030 in the world's first sector-wide commitment of its kind. The Net Zero 2030 Route map has been developed using over a decade's worth of detailed data and provides water companies with a framework on which to develop and cost their own net zero action plans.
The Groundwater Regulations (2009)	The Groundwater Regulations transpose the European Union Groundwater Directive (2006/118/EC) into UK law. The Regulations set out how to protect groundwater from pollution by detrimental substances.
Flood and Water Management Act (2010)	Relates to the management of flooding and coastal erosion. The Act aims to reduce the flood risk associated with extreme weather, compounded by climate change. It created the role of Lead Local Flood Authority, which is the local government authority responsible for managing flood risk in the local government area. The Flood and Water Management Act was preceded by The Pitt Review of 2007.
The Water Resources Management Plan Regulations (2007)	Sets out the statutory duty for water companies to prepare and issue a Water Resources Management Plan. The duty to prepare and maintain a WRMP is set out in sections 37A to 37D of the Water Industry Act 1991. They must be prepared at least every five years and reviewed annually.
Water UK - Water Resources long term Planning Framework 2015-2065 (2016)	The primary aim of the project is to develop a high-level strategy and framework for the long-term planning of water resources for Public Water Supply in England and Wales.
Water Supply (Water Quality) Regulations (2016) (as amended)	This statutory instrument concerns water quality supplies for human consumption.
National Policy Statement for Wastewater (2012)	A framework document for planning decisions on nationally significant wastewater infrastructure.
Environment Agency - Water Resources Planning Guideline (2021)	Water companies in England or Wales must prepare and maintain a water resources management plan (WRMP). This sets out how you intend to achieve a secure supply of water for your customers and a protected and enhanced environment. The duty to prepare and maintain a WRMP is set out in sections 37A to 37D of the Water Industry Act 1991.
Urban Waste Water Treatment (England and Wales) Regulations (1994)	The Regulations transpose the EU Urban Waste Water Treatment Directive (91/271/EEC). The aim is to set out to the regulation of sewage disposal.

The Nitrate Pollution Prevention Regulations (2015)	The Regulations transpose EU Nitrates Directive (91/676/EEC) into UK law. The aim is to reduce nitrate related pollution in the water environment.
UK Marine Policy Statement (2011)	Provides the framework for preparing marine plans and the marine planning system. Marine plans put into practice the objectives for the marine environment alongside the National Planning Policy Framework (NPPF).
Defra - Catchment Based Approach: Improving the quality of our water environment (2013)	A policy framework to encourage the wider adoption of an integrated Catchment Based Approach to improving the quality of our water environment. This is important when trying to address the significant pressures placed on the water environment by diffuse pollution from both agricultural and urban sources, and widespread, historical alterations to the natural form of channels.
National Chalk Stream Strategy, (CaBA Chalk Stream Strategy) (2021)	Chalk streams are a rare and valuable habitat, often referred to as the equivalent of England's rain forests or Great Barrier Reef. 85% of all chalk streams are found in England, mainly in the south and east of the country, as well as dozens of smaller chalk springs, rills and flushes. They stretch from Yorkshire through East Anglia, the Chilterns, Kent, Hampshire, and Dorset, and are important for biodiversity. This new chalk stream strategy is for everyone who has responsibility for, or uses, chalk streams. It sets out actions and recommendations for government, regulators and the water industry on water resources, water quality and habitat restoration and management.
Environment Agency - Drought response: our framework for England (2017)	This framework tells you how drought affects England and how the Environment Agency works with government, water companies and others to manage the effects on people, business, and the environment. It aims to ensure consistency in the way we co-ordinate drought management across England.
Government's Storm Overflow Discharge Reduction Plan (2022)	This aims to eliminate all harm from storm overflows in the long-term. It proposes the introduction of overflow targets which focus on high priority sites in the short-term and notes that 'Water companies must clearly set out how they will meet their storm overflow targets in their Drainage and Wastewater Management Plans'.
Overarching	
Environment Act (2021)	The Legislation will improve air and water quality, tackle waste, increase recycling, halt the decline of species, and improve our natural environment through a series of legally binding targets and guiding policy.
National Planning Policy Framework (NPPF) (2021)	The updated NPPF sets out government's planning policies for England and how these are expected to be applied. A key aim is to achieve sustainable development.
A Green Future: Our 25 Year Plan to Improve the Environment (2018)	25 Year Environment Plan was published by the Government in January 2018. It sets out sets out government action to help the natural world regain and retain good health. It aims to deliver cleaner air and water in our cities and rural landscapes, protect threatened species and provide richer wildlife habitats. It calls for an approach to agriculture, forestry, land use and fishing that puts the environment first. The Plan looks forward to delivering a Green Brexit. Measures to implement the plan include consulting on setting up a new independent body to hold government to account; a new set of environmental principles to underpin policymaking; and strengthening leadership and delivery through better local planning. Policies include <ul style="list-style-type: none"> • 'Embedding an 'environmental net gain' principle for development, including housing and infrastructure'; • 'Supporting larger scale woodland creation'; • 'Expanding the use of natural flood management solutions'; • 'Publishing a strategy for nature'; • 'Developing a Nature Recovery Network'; • 'Increasing water supply and incentivising greater water efficiency and less personal use'; • 'Promoting health and wellbeing through the natural environment'; • 'Creating more green infrastructure'; • 'Planting more trees in and around our towns and cities'; • 'Reducing the impact of wastewater'; • 'Publishing Clean Air Strategy'; and • 'Tackling climate change'.

The Environmental Damage (Prevention and Remediation) (England) Regulations (2015)	Provides additional protection to habitats and species identified on Annexes one and two of the EC Habitats Directive (92/43/EEC), SSSIs and, in some cases, classified waterbodies from environmental damage where an operator has intended to cause damage or been negligent to the potential for damage.
The Wildlife and Countryside Act (1981) (as amended)	The Wildlife and Countryside Act is a major driver in the protection of animals, plants and habitats in the UK. It implements the Bern Convention and the Birds Directive and contains details of designated sites/species.
Environment Protection Act (1990)	The fundamental structure and authority for waste management and control of emissions into the environment.
Countryside and Rights of Way Act (2000)	Aims to give greater freedom for people to explore open countryside. It also includes a power to extend the right to coastal land.
The Natural Environment and Communities Act (2006)	NERC is designed to help achieve a rich and diverse natural environment and thriving rural communities through modernised and simplified arrangements for delivering Government policy. It is about conserving and enhancing places and nature and helping people to enjoy them.
Environmental Assessment of Plans and Programmes Regulations (2004)	This regulation transposes the SEA Directive into UK law which requires an assessment of the effects of certain plans and programmes on the environment.
National Infrastructure Strategy (2020)	The National Infrastructure Strategy sets out plans to transform UK infrastructure to level up the country, strengthen the Union and achieve net zero emissions by 2050.
Ancient Woodland and Veteran Trees: Protecting them from development (2014)	Standing advice is a 'material planning consideration'. This means you should take it into account when making decisions on planning applications. Ancient woodland is defined as an irreplaceable habitat which is important for wildlife, soils, recreational value and cultural, historical and landscape value. The advice relates to both conserving and enhancing biodiversity and reducing the level of impact of the proposed development on areas of ancient woodland and ancient/veteran trees.
Climate change approaches in water resources planning – overview of new methods (2013)	The aim of the project was to examine how climate change has been built into water resource management plans (WRMPs) to date, and to recommend best and appropriate practice for the future, with particular reference to the use of the detailed tools and probabilistic climate data in UKCP09.
Regional and Local	
<i>Biodiversity</i>	
Local Nature Recovery Strategies	The Environment Act 2021 introduced Local Nature Recovery Strategies for areas in England. Public authorities will have duties in relation to these.
Biodiversity Action Plans	Local biodiversity action plan objectives include those associated with maintaining and safeguarding the current extent of protected designations and recognised habitats and achieving favourable status for these areas. Each National Park has a Biodiversity Action Plan, and some local authorities have their own or a combined one with neighbouring authorities.
Common Standards Monitoring Guidelines (CSMGs)	Common Standards Monitoring was developed to provide an agreed approach to the assessment of condition on statutory sites designated through UK legislation and international agreements. CSMGs can be found via the Designated Sites View System Site Search.
<i>Landscape</i>	
Natural England, AONB Management Plans (2016 – 2022)	These plans include an assessment of the special quality of the AONB, such as a landscape character assessment that includes its condition and vulnerability to change and a monitoring plan to show how you'll measure the AONB's condition and effectiveness of management. Please note the Yorkshire Wolds AONB is likely to be designated during the DWMP Process.
Natural England National Character Area (NCA) Profiles (2012 - 2015)	The profiles summarize the characteristics which are unique to that local area and gives it a distinctive sense of place.
<i>Water Resources</i>	
Environment Agency River Basin Management Plans (2022)	River basin management plans (RBMPs) set the legally binding locally specific environmental objectives that underpin water regulation (such as permitting) and planning activities. They provide a stable planning base for economic development.

Environment Agency - Catchment Flood Management Plans (CFMPs) (2009)	CFMPs set out the risk for each catchment in relation to flooding from rivers, tidal, surface water, groundwater, and reservoirs, but not directly from sea/coastal flooding which is under the remit of a Shoreline Management Plan. The role of the CFMPs is to establish flood risk management policies which will deliver sustainable flood risk management for the long term.
Environment Agency - Abstraction licensing strategies (CAMS process) (2013)	These Licensing Strategies set out how water resources are managed. It provides information about where water is available for further abstraction and an indication of how reliable a new abstraction licence may be.
Local and District Flood Risk Management Strategies	These set out useful local information and identifies objectives to manage local/ district flood risk to local communities. They consider all sources of flood risk such as surface water, groundwater, and ordinary watercourses.
Water Resources North (WReN) Regional Plan – Environmental Assessment - Scoping Report (2021)	Yorkshire Water, Northumbrian Water, and Hartlepool Water make up WReN's core companies. Water Resources North (WReN) is one of five regional water resources groups working under the National Framework for Water Resources (the 'National Framework'). The draft Regional Plan is anticipated to be ready in early 2022 which will be accompanied by the associated assessment reports.
Marine Management Organisation: North East Inshore and Offshore Marine Plans (2021) East Inshore and Offshore Marine Plans (2015)	The North East Marine Plans provide a framework that will shape and inform decisions over how the areas' waters are developed, protected, and improved over the next 20 years. It covers an area of inshore and offshore waters stretching from the Scottish border to Flamborough Head, in Yorkshire. The East Inshore Marine Plan area includes the coastline stretching from Flamborough Head to Felixstowe, far south of the River Humber, extending from mean high water out to 12 nautical miles with the applicable offshore plan outside of this.
Environment Agency & Partners Humber 2100+ Strategy	Due to the enormous economic importance of the estuary and the scale of tidal flood risk, the Environment Agency and 12 Local Authorities from around the Humber, are working in partnership to develop a strategy that will address the risk and enable sustainable growth now and for the next 100 years. The Humber Flood Risk Management Strategy focuses on the area around the Humber where flooding from the sea is the main source of flood risk. Other strategies identify ways of managing different sources of flooding such as from overtopping of rivers and heavy rainfall.
Local LLFA Sustainable Drainage Standards	These set out guidance/ best practice on sustainable drainage matters and are commonly used by developers with the aim to meet/ exceed the requirements for submission of planning applications such as flood risk assessments, drainage strategies, and SuDS design, amongst others.
Shoreline Management Plans	Shoreline management plans are developed by Coastal Groups with members mainly from local councils and the Environment Agency. They identify the most sustainable approach to managing the flood and coastal erosion risks to the coastline in the short-term (0 to 20 years); medium term (20 to 50 years); and long term (50 to 100 years).
Local and Regional River Restoration Plans	These set out a plan for restoring rivers, predominantly in a 'natural' context through rewilding, improving natural flood management, wetlands, de-channelising, and more (such as EA/NE SSSI River Restoration Pollution Plans (DWPPs) for River Derwent SSSI/SAC, River Hull Headwaters SSSI and River Wharfe SSSI). Some may focus on water quality and others may focus more on flood risk depending on their needs and public interests. Across the region there are many plans predominantly authored by Local authorities, local river trusts, National Parks, and wildlife organisations.
Local and Regional Diffuse Water Pollution Strategies	These set out a plan for investigating/ reducing sources of diffuse pollution into waterbodies (such as EA/NE SSSI Diffuse Water Pollution Plans (DWPPs) for River Derwent SSSI/SAC, Hornsea Mere SSSI/SPA and Malham Tarn SSSI/SAC). Many in urban areas are heavily modified water bodies that have suspected/known urban pollution sources negatively impacting water quality, including waterbodies under WFD. In more rural areas, especially National Parks, there are catchment sensitive farming strategies/ schemes such as those in the Yorkshire Dales Catchment Partnership.
<i>Heritage</i>	
Heritage Coast Management Plans	Heritage coasts are 'defined' rather than designated, so there isn't a statutory designation process like that associated with national parks and areas of

	outstanding natural beauty (AONB). They were established to conserve the best stretches of undeveloped coast in England. A heritage coast is defined by agreement between the relevant maritime local authorities and Natural England.
World Heritage Site Management Plans for Saltaire and Studley Royal Park	According to the “Operational Guidelines for the Implementation of the World Heritage Convention” every site inscribed on the World Heritage List must have a management plan explaining how the outstanding universal value of the site can be preserved. Management plans are the central planning instrument for the protection, use, conservation, and the successful development of World Heritage sites.
Overarching	
Local Development Plans and Green Infrastructure Plans /Strategies.	Local Development Plans are the main framework for planning in local authorities and set out the long-term spatial concept. They include policies for sustainable development including environmental, social, and economic. In some instances, LDP are supported by green infrastructure plans/strategies which set out the details on the provision and access to quality multifunctional green spaces. The following local authorities are located within the Study Area and therefore their Local Plans are relevant: Ashfield; Barnsley; Bolsover; Bradford; Burnley; Calderdale; Chesterfield; County Durham; Craven; Derbyshire Dales; Doncaster; East Riding of Yorkshire; Eden; Hambleton; Harrogate; High Peak; Kingston upon Hull; Kirklees; Leeds; North East Derbyshire; North Lincolnshire; Oldham; Pendle; Redcar & Cleveland; Ribble Valley; Richmondshire; Rochdale; Rossendale; Rotherham; Ryedale; Scarborough; Selby; Sheffield; South Lakeland; Wakefield; and York.
Defra, Public Rights of Way Improvement Plans (ROWIPs)	ROWIPs outline how local authorities aim to enhance public rights of way to ensure improved accessibility, connectivity, and quality of the network.
National Park Management Plans: Peak District 2018- 2023 (2018) Yorkshire Dales 2019 – 2024 (2019) North York Moors 2017 – 2022 (2017)	Every National Park has a National Park Management Plan. It’s the most important document for the National Park, setting out how the National Park and partners will work together to achieve shared objectives for the future management of the National Park. The Plans aim to achieve the long-standing vision for the respective parks.
Water/ Wastewater Company specific - Yorkshire Water	
Water Resources	
Yorkshire Water’s Business Plan for 2020-2025 (2019)	The plan will outline how water and waste water services are delivered in a resilient and sustainable way. Future planning is a big part of the company’s thoughts and over 30,000 customers and stakeholders have been involved in creating the plan.
Drought Plan – Drought Plan (2021)	The Drought Plan identifies management of future droughts. It identifies what measures are available to reduce demand and support supplies and what triggers can be used to identify when actions are required. The Plan also outlines how a company will communicate with customers during a drought and utilise links to external water companies if required.
Yorkshire Water Resource Management Plan (WRMP) (2019)	The current plan is the Water Resources Management Plan 2019, and it is supported by a Strategic Environment Assessment. It shows the plan to maintain a secure supply of water to customers over the next 25 years. The plan is developed following guidance from the Environment Agency and is reviewed and revised every 5 years.
Yorkshire Water SuDS Design Guidance (2021)	This document provides design guidance to develop the Scope of retrofit capital projects up to Gate 3 of the AMP 7 Engineering Design Approach (EDA) as well as for external developers designing and constructing SuDS devices for the adoption by Yorkshire Water. The scope of this design guidance is Sustainable Drainage Systems (SuDS) that are designed to be owned and/or maintained by YW in accordance with clauses A6.11 and A6.19 of the Codes for Adoption (2020).

Appendix C ENVIRONMENTAL BASELINE REVIEW AND FUTURE TRENDS



ENVIRONMENTAL BASELINE

1.1 BIODIVERSITY AND GEODIVERSITY

Biodiversity is the variety of plants (flora) and animal life (fauna) within an area/ habitat. The importance of maintaining and improving biodiversity is recognised from a local scale up to the international scale, and the UK is one of the world's most nature-depleted countries¹.

Data for this SEA topic at this strategic level mostly relates to internationally and nationally designated sites which have the highest level of protection within the UK and are home to some of the highest value biodiversity, more local datasets will be identified in later stages of the SEA process. It is recognised that biodiversity value extends beyond designated sites, not only to other designated sites, but also to the connectivity between habitats. This is considered through the Habitat Network. Please note, all sites listed in this baseline are intersecting sites, i.e., the boundary of the site overlaps the boundary of the Level 1 area. The HRA Report will set out what study area has been used for that specific assessment.

Ramsar Sites are wetlands of international importance designated under the Ramsar Convention. Three Ramsar Sites intersect the Level 1 Region and are listed in **Table 1**.

Special Areas of Conservation (SAC) are protected areas under the Conservation of Habitats and Species Regulations 2017 (as amended) which require establishment of a network of important high-quality conservation sites that will make a significant contribution to conserving the habitats and species. Twenty SACs are located within the Level 1 Region and are listed in **Table 1**. SACs can include marine components to protect habitat and/ or species associated with the marine environment.

Special Protection Areas are protected areas for birds under the Conservation (Natural Habitats) Regulations 2010 (as amended). Ten Special Protection Areas, made up of 63 individual areas, are located within the Level 1 Region and are listed in **Table 1**. These can include marine components to protect bird species that are dependent on the marine environment for all or part of their lifecycle.

A Site of Special Scientific Interest (SSSI) describes an area that is of particular interest to science due to the rare species of fauna or flora it contains or important geological or physiological features that may lie within its boundaries. Within the Level 1 Region there are 327 SSSIs, made up of 563 individual areas, listed in **Table 1**.

National Nature Reserves (NNRs) were established to protect some of the most important habitats, species, and geology, and to provide 'outdoor laboratories' for research. Nine NNRs intersect the Level 1 Region and are listed in **Table 1**.

Marine Conservation Zones (MCZs) are areas designated by Ministerial Orders to protect a range of nationally important, rare, or threatened marine habitats and species. Two MCZs intersect the Level 1 Region and are listed in **Table 1**. One further MCZ is located over 10km east from the Holderness Coast. No biosphere reserves are present in the region.

Due to the strategic nature of SEA, local sites are not directly referred to in this report, including Sites of Importance for Nature Conservation; Local Wildlife Sites; and Local Nature Reserves.

¹ BBC News (2021) Biodiversity: UK is one of the world's most nature-depleted countries, available from: <https://www.bbc.co.uk/newsround/58863097>, accessed April 2022.

There are specific national and trans-national policies that apply to certain species such as shellfish or eel which should be followed where these are applicable to specific options at the plan implementation stage.

Regionally (and to an extent nationally), there is public and political focus on wastewater discharge and the socio-economic/ environmental impact for shellfish and other species² as well as wider environmental and social uses.

Table 1 – Biodiversity datasets intersecting the Level 1 Region

Biodiversity Dataset	List of intersecting sites within the Level 1 Region
Ramsar	<ul style="list-style-type: none"> • Humber Estuary • Malham Tarn • Lower Derwent Valley
SAC	<ul style="list-style-type: none"> • Humber Estuary • Craven Limestone Complex • Beast Cliff Whitby (Robin Hood's Bay) • Kirk Deighton • Denby Grange Colliery Ponds • Ox Close • Strensall Common • Ellers Wood & Sand Dale • Skipwith Common • Hatfield Moor • Arnecliff & Park Hole Woods • North Pennine Dales Meadows • South Pennine Moors • Thorne Moor • Fen Bog • Flamborough Head • North York Moors • Lower Derwent Valley • River Derwent • North Pennine Moors
Special Protection Area	<ul style="list-style-type: none"> • Greater Wash • Hornsea Mere • Humber Estuary • South Pennine Moors Phase 2 • Peak District Moors (South Pennines Moors Phase 1) • Thorne & Hatfield Moors • Flamborough and Filey Coast • North York Moors • Lower Derwent Valley • North Pennine Moors
SSSI	<ul style="list-style-type: none"> • Acaster South Ings • Allerthorpe Common • Angram Bottoms • Arkengarthdale, Gunnerside and Reeth Moors • Arkle Beck Meadows, Whaw • Arnecliff and Park Hole Woods • Ashberry and Reins Wood • Ashfield Brick Pits • Askham Bog • Askrigg Bottoms • Aubert Ings • Aysgarth (G) • Barn Hill Meadows • Bastow Wood • Beck Dale Meadow • Beck Hole • Beckhead Plantation • Bellerby Fields • Betton Farm Quarries (G) • Bilham Sand Pits (G) • Biller Howe Dale • Bingley South Bog • Birkham Wood • Birks Fell Caves (G) • Bishop Monkton Ings • Bishop Wilton Deep Dale • Bishop Wilton Poor Land • Black Keld Catchment (G) • Black Scar Quarry (G) • Blaiskey Bank Springs • Bolton Percy Ings • Boreham Cave (G) • Boulby Quarries (G) • Kisdon Force Woods • Ladyhills • Lambwath Meadows • Langcliffe Scars and Jubilee, Albert, and Victoria Caves (G) • Leeds - Liverpool Canal • Len Pastures, Crackpot • Leven Canal • Leyburn Glebe • Linton Common • Little Don Stream Section (G) • Littlebeck Wood • Lovely Seat - Stainton Moor • Low Gill Moor Wetlands • Low Pasture • Lower Swaledale Woods And Grasslands • Madbanks and Ledsham Banks • Malham-Arnecliffe (M) • Malham-Arnecliffe (Cool Pasture) • Mallerstang-Swaledale Head • Mar Field Fen • Marsett Rigg • Meadow Croft, Skythorns • Melbourne and Thornton Ings • Melton Bottom Chalk Pit (G) • Micklefield Quarry (G) • Mickleton Ings • Mill Holme Meadow, Thwaite • Millington Wood and Pastures (M) • Moss Valley • Moss Valley Meadows • Moss Valley Woods • Mount Pleasant Quarry (G)

² ITV News (2022) Fishermen scared for livelihoods as sea creatures disappear from Yorkshire coast, available from: <https://www.itv.com/news/calendar/2022-01-15/mass-crab-deaths-could-spell-disaster-for-yorkshire-coast-tourism>, accessed April 2022.

Appendix C – Environmental Baseline

Biodiversity Dataset	List of intersecting sites within the Level 1 Region	
	<ul style="list-style-type: none"> • Bowes Moor • Boynton Willow Garth (M) • Bradgate Brickworks (G) • Brantingham Dale • Brants Gill Catchment (G) • Breary Marsh • Brighton Meadows • Bride Stones (M) • Brimham Rocks (M) • Broadhead Clough • Brockadale • Bryan Mills Field • Bull Ings (M) • Burr Closes, Selby • Burton Bushes • Burton Leonard Lime Quarry • Cadeby Quarry (G) • Canyards Hills (M) • Carlton Main Brickworks (G) • Castle Hill Deer Park and Windy Pits (M) • Castlebeck and Scar Woods • Cawthorn Moor • Caydale • Cayton, Cornelian and South Bays (M) • Chris's Pasture • Church Ings • Cinquefoil Brow and Wood Dale • Cliff Beck Meadow, Buttertubs • Cliff Force Cave (G) • Clifton Ings And Rawcliffe Meadows • Clints Quarry (G) • Cockerham Meadows, Thorpe • Cockrah Wood • Conistone Old Pasture (Mixed) • Cottam Well Dale • Cow Cliff Pasture and Quarry • Cow Myers • Cracoe Reef Knolls (G) • Crimsworth Dean (G) • Cropton Banks and Howlgate Head Woods • Dalby Bush Fen • Dark Peak (Mixed) • Dearne Valley Wetlands • Deepdale Meadows, Langstrothdale • Denaby Ings • Denby Grange Colliery Ponds • Derwent Ings • Dimlington Cliff (G) • Doe Lea Stream Section (G) • Dovedale Wood • Dow Cave System (G) • Drewton Lane Pits (Mixed) • Duckmanton Railway Cutting (G) • Duncombe Park • East Heslerton Brow • East Keswick Fitts • East Nidderdale Moors (Flamstone Pin - High Ruckles) • Eastern Peak District Moors (Mixed) • Eccup Reservoir • Elland Bypass Cutting (G) • Ellerburn Bank • Enthorpe Railway Cutting (G) • Eskamhorn Meadows • Everthorpe Quarry (G) • Fairburn and Newton Ings • Fairy Call Beck (G) • Far Mains and Far Limekiln Close Meadows • Farndale 	<ul style="list-style-type: none"> • Muker Meadows • Nabgate • Naburn Marsh • Neepsend Brickworks (G) • Neepsend Railway Cutting (G) • New Close, Calvert Houses • New House Meadows, Malham • Newbald Becksies • Newbridge Quarry (G) • Newsome Bridge Quarry (G) • Newton Mask • Newtondale (Mixed) • Newton-le-Willows Meadows • Nine Spring Dale • Noddle End • North Bay to South Toll House Cliff (G) • North York Moors • Norwood Bottoms • Nostell Brickyard Quarry (G) • Nunnington Cutting and Quarries (G) • Oughtershaw and Beckermonds • Owston Hay Meadows • Ox Close • Park Clough (G) • Park Hall Meadows, Healaugh • Pen y ghent Gill (M) • Pen-y-ghent (M) • Pikedaw Calamine Caverns (M) • Pilmoor • Pocklington Canal • Potteric Carr • Pry and Bottom Meadows, Mid Mossdale • Pulfin Bog • Pye Flatts Meadows • Quarry Moor • Raincliffe & Forge Valley Woods • Rake Dike (G) • Richmond Meadows • Rievaulx Woods • Rifle Butts Quarry (G) • Ripon Parks • River Derwent • River Hull Headwaters • River Ure Bank, Ripon Parks (G) • River Ure Grasslands • River Wharfe • Roach Lime Hills • Robin Hood's Bay: Maw Wyke to Beast Cliff (M) • Roos Bog (G) • Runswick Bay (G) • Ruston Cottage Pasture • Sandall Beat • Scar Closes, Kisdon Side • Scar End Wood • Scoska Wood • Seckar Wood • Seive Dale Fen • Semerwater • Shaw Beck Gill • Shaw's Gate Quarry (G) • Sherburn Willows • Shirley Pool • Sked Dale • Skipsea Bail Mere (G) • Skipwith Common • Sleightholme Dale • Snape Hill Quarry (G) • Snaper Farm Meadows • South Cliffe Common

Appendix C – Environmental Baseline

Biodiversity Dataset	List of intersecting sites within the Level 1 Region	
	<ul style="list-style-type: none"> • Farnham Mires • Feetham Holme • Filey Brigg (M) • Flamborough Head (M) • Flamborough Railway Cutting • Fordon Chalk Grasslands • Forlorn Hope Meadow • Fothering Holme • Freeholders Wood • Fulford Ings • Gingerfields • Golden Hill Pit (G) • Gormire (M) • Gouthwaite Reservoir • Gowerdale Windy Pits/Peak Scar (M) • Grass Wood • Grassington Hospital Grounds • Great Almscliff Crag (G) • Great Dib Wood (G) • Green Lane Pit (G) • Greenfield Meadow • Greenhow Pasture • Greenhow Quarry (G) • Gristhorpe Bay and Red Cliff (G) • Hack Fall Wood • Hackness Head Quarry (G) • Hackness Rock Pit (G) • Hambleton Quarry (G) • Harewood Grange Stream Section (G) • Harker's House Meadows • Harwood Dale Moor (G) • Hatfield Chase Ditches • Hatfield Moors • Haugh and Gundale Slacks • Haw Crag Quarry (G) • Hawkswick Wood • <u>Hay-a-Park</u> • Hayburn Wyke (M) • Hell Gill (G) • Heslington Tillmire • Hetchell Wood • Hill House Nab (G) • Hoddy Cows Spring • Hole of Horcum (M) • Holy Well Bridge (G) • Honley Station Cutting (G) • Hook Moor • Hornsea Mere • Horse Dale and Holm Dale • Horse Field, Gilling • Hotham Meadow • Humber Estuary – 2000480 (Mixed) • Iron Scar and Hundale Point to Scalby Ness (G) • Jeffry Bog • Keasey Dale • <u>Keasden Moor</u> • Kelsey Hill Gravel Pits (G) • Kettlewell Meadows • Kilnsey Flush • Kiplingcotes Chalk Pit • Kirk Deighton • Kirkby Wharfe • Kirkdale Cave (G) • Kirkham Park & Riverside 	<ul style="list-style-type: none"> • South Elmsall Quarry (G) • South Pennine Moors (M) • Spell Howe Plantation • Spiker's Hill Quarry (G) • Spring Meadows, Alderman's Head & Cow Croft Meadows • Spring Wood, Hawnbay • Sprotbrough Gorge • Stairfoot Brickworks (G) • Staithes - Port Mulgrave (G) • Standedge Road Cutting (G) • Stannington Ruffs (G) • Stephen Ings, Crackpot • Stonehead Beck ('Gill Beck') (G) • Stonepit and Nova Slacks • Stran's Gill (G) • Strensall Common • Strid Wood • Stump Cross Caves (G) • Stutton Ings • Swale Lakes • Swinden Quarry (G) • Swineley Meadow, Widdale • Tadcaster Mere (G) • The Ings, Amotherby • The Lagoons • Thixen Dale and Longdale • Thorne, Crowle and Goole Moors • Thowker Corner • Three Dykes • Thwaite Stones • Tophill Low • Totley Wood • Townclose Hills • Tranmire • Trench Meadows • Troutsdale and Rosekirk Dale Fens • Upper Dunsforth Carrs • Upper Nidderdale (G) • Upper Wharfedale • <u>Vessey Pasture Dale and Back Dale</u> • Wadsley Fossil Forest (G) • Walden Meadows • Wanlass Grasslands • Waterdale • Wath Quarry (G) • Went Ings Meadows • Wentbridge Ings • West End Meadow, Lunds • West Nidderdale, Barden and Blubberhouses Moors • Wharncliffe Craggs (G) • Wharram Quarry • Whitby-Saltwick (G) • Whitcliffe Section, Quarry Moor (G) • White Carr Meadow • Whitfield Gill and Mill Gill (G) • Wintringham Marsh • Withens Clough • Withow Gap, Skipseab (G) • Wyedale • Yeadon Brickworks & Railway Cutting (G) • <u>Yockenthwaite Meadows</u>
NNR	<ul style="list-style-type: none"> • Scoska Wood • Duncombe Park • Spurn • Malham Tarn 	<ul style="list-style-type: none"> • Lower Derwent Valley • Humberhead Peatlands • Skipwith Common • Forge Valley Woods

Biodiversity Dataset	List of intersecting sites within the Level 1 Region	
	<ul style="list-style-type: none"> New House Farm, Malham 	
MCZ	<ul style="list-style-type: none"> Holderness Inshore 	<ul style="list-style-type: none"> Runswick Bay

Note: In SSSI row, (G) stands for geology interest; (M) stands for mixed interest. Those without the bracket stand for biological interest.

Priority Habitats were those that were identified as being the most threatened and requiring conservation action under the UK Biodiversity Action Plan. These habitats are now listed in Section 41 of the Natural Environment and Rural Communities (NERC) Act and called 'Habitats of Principal Importance'. They are important habitats for wildlife and protection from harmful development is supported by the NERC Act and the National Planning Policy Framework (NPPF). The Environment Act (Part 6, Section 102) has strengthened the NERC Act duty to include 'Enhance' biodiversity. There are a range of designated NERC Act Section 41 habitats within the Level 1 Region which are listed below. YW has a duty to have regard to the conservation of biodiversity in exercising its function relating to habitats and species of principal importance.

- Blanket bog
- Calaminarian grassland
- Coastal and floodplain grazing marsh
- Coastal saltmarsh
- Coastal sand dunes
- Deciduous woodland
- Fragmented heath
- Good quality semi-improved grassland
- Grass moorland
- Limestone pavement
- Lowland calcareous grassland
- Lowland dry acid grassland
- Lowland fens
- Lowland heathland
- Lowland meadows
- Lowland raised bog
- Maritime cliff and slope
- Mudflats
- No main habitat but additional habitats present
- Purple moor grass and rush pastures
- Reedbeds
- Saline lagoons
- Traditional orchard
- Upland calcareous grassland
- Upland flushes, fens and swamps
- Upland hay meadow
- Upland heathland

In recognition of the importance of connectivity between habitats (which increases resilience to climate change), Habitat Networks have been mapped by Natural England at the national scale³. This network covers approximately 50% of the total study area with upland areas to the north and west having greatest coverage, largely correlating to the Yorkshire Dales and North York Moors National Parks. The Environment Act states that 'a local nature recovery strategy for an area is to be prepared

³ Natural England (2021) [Habitat Networks \(Combined Habitats\) \(England\) | Habitat Networks \(Combined Habitats\) \(England\) | Natural England Open Data Geoportal \(arcgis.com\)](#), accessed March 2022.

and published by the responsible authority' – this might be a local authority or national park as examples.

Soil is a limited resource under pressure from climate change, population growth, urban development, waste, pollution, and the demand for more (and cheaper) food. Soil also stores more carbon than the atmosphere, is an important habitat, and can help reduce flood risk and prevent drought through holding water.

Provisional Agricultural Land Classification groups land within the region into five grades. Grade one is the best quality and grade five is poorest. Several criteria are used for assessment and include climate, site (gradient, micro-relief, flood risk) and soil. Outside of urban areas, western parts of the Level 1 Region generally have a lower grade owing largely to higher elevation along the Pennines. Generally, areas to the east, outside of the North York Moors National Park, are higher quality grade (mostly Grade 2 or 3). Northern areas generally have a lower quality grading, owing largely to the higher elevated areas within the two National Parks, and possibly some marginal latitude variation. Some small sections of the Level 1 Region are ranked as Grade 1 land, which is the highest quality agricultural land within the UK, and relatively rare in northern England. The Grade 1 land is located within the Level 2 SPAs of Derwent & Rye, Lower Ouse, and the Lower Don.

Yorkshire has a diverse landscape which allows for a variety of farming uses. Defra data for the Yorkshire & Humber region for 2019 shows that grazing livestock farms accounted for 32% of farmed area, and that cereal farms covered 30% of farmed area. Although pig farms accounted for a smaller proportion, the region accounted for 37% of the total English pig population⁴.

Regionally important geological and geomorphological sites (RIGS) are locally designated sites of local, regional, or sometimes national importance for geodiversity (geology and geomorphology). In some local areas locally designated sites including RIGS with substantive geological interest may now be called local geological sites.

Coastal erosion rates along the Holderness Coast are high owing to soft glacial till (mostly made up of clay, pebbles, and sand), making it vulnerable to coastal erosion. "Recent records suggest that parts of the East Riding coastline are eroding at an average rate of up to 4 metres per year; however, certain locations which are not defended can experience individual cliff losses of 20 metres or more due to natural processes"⁵.

The geology across the region, including bedrock and superficial, is greatly varied. Using mapping provided by the British Geological Survey⁶, a summary is that:

- The oldest rocks are generally found in the west of Yorkshire, with the youngest in the east. Large parts of the region have been influenced by historical glacial activity, particularly upland areas in the north and west.
- Carboniferous Limestone and overlying Upper Carboniferous Millstone Grit dominate upland countryside of the Yorkshire Dales and the North Pennines.
- The South Yorkshire area is underlain by rocks of Carboniferous age.
- Moorland along the Pennines feature shales and sandstone beds of Millstone Grit.

⁴ GOV.UK (2019) Agriculture Regional Profiles, available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/972098/regionalstatistics_yorkshumber_23mar21.pdf, accessed February 2022.

⁵ East Riding Council (2022) Coastal change in the East Riding, available from: <https://www.eastriding.gov.uk/environment/sustainable-environment/looking-after-our-coastline/coastal-change-in-the-east-riding/>, accessed February 2022.

⁶ BGS (2022) Geology of Britain Viewer, available from: [Geology of Britain viewer | British Geological Survey \(BGS\)](#), accessed February 2022.

- The geology of the East Riding of Yorkshire includes clays, limestone, and sandstones of Jurassic age. The Chalk Wolds are a series of hills ranging from the area around Flamborough Head to the River Humber with coastal areas between these locations experiencing high erosion rates.
- Historic coal mining took place across many parts of the Level 1 region, with many urban locations built in proximity.

LIKELY FUTURE WITHOUT THE PLAN
<p>Development is likely to increase the risk of habitat loss and fragmentation, particularly outside of the extensive designated areas. The recent Environment Act requires a biodiversity net gain from developments where planning permission is required.</p> <p>The Defra 25 Year Environment Plan includes a commitment to restore 75% of terrestrial and freshwater protected sites to favourable condition and to create or restore 500,000 hectares of wildlife-rich habitat outside the protected site network, focusing on priority habitats as part of a wider set of land management changes providing extensive benefits.</p> <p>Climate change will impact wildlife in the future by various means including, but not limited to, drought, timing of seasonal activities, higher frequency of storms, native species redistribution, invasive non-native species, and increased potential for wildfire.</p> <p>Changing climate could impact on the quality of soils across the region through temperature changes and shifting rainfall patterns. The Holderness Coastline erosion rate could be increased by climate change and localised rates could be impacted by coastal management techniques used to protect urban areas. Policy on soil improvement should lead to an improvement in reducing degradation/ erosion despite developmental pressures. This is important on a regional, and national scale, to ensure soil sustainability with potential negative impacts for food production and water quality.</p>

1.2 HUMAN HEALTH

According to regional data published by the Office for National Statistics, Yorkshire and the Humber had a 2018 population of approximately 5,480,000. The projected population growth is expected to be 3.6% to a 2028 population of 5,674,000. This is below the English national projected growth of 5% between 2018 and 2028⁷ and is the second lowest for all English regions. It should be noted that the planned growth through Local Development Plans amounts to a 7.2% increase in population from 2020 to 2030, this higher growth rate has been applied within the DWMP modelling to ensure a robust assessment.

Yorkshire and the Humber has lower life expectancy compared to the whole of England. Data released in September 2020 showed that regional life expectancy for males was 78.8 and for females was 82.5 in 2017 to 2019 compared to England national averages of 79.8 for males and 83.4 for females. Only the North East and the North West had lower regional averages for males and females in England.

Health profiles are published by Public Health England and record multiple indicators which collectively provide a summary for human health on a local authority scale. Data such as mortality rates, rates of cardiovascular diseases, suicide rates, and more can all be reviewed. Many local authorities were significantly below both regional and national averages for several indicators⁸, with

⁷ Office for National Statistics (2020) Subnational population projections for England: 2018-based, available from: <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/bulletins/subnationalpopulationprojectionsforengland/2018based>, accessed June 2022.

⁸ Public health England (2022) Health Profiles, available at: [Local Authority Health Profiles - PHE](#), accessed June 2022.

links to some of the socio-economic data in **Section 1.3**. There are numerous Public Rights of Way (PRoW) and cycle network routes across the region and access is an important part of policy for many designated sites. Any temporary or permanent closures or diversions to PRoW will need to be considered by the respective Local Planning Authority at a later phase.

LIKELY FUTURE WITHOUT THE PLAN
<p>An expected growth in population will bring opportunities and challenges to the region. The age profile across the whole UK is ageing and this also puts additional pressures on public finance and services.</p> <p>Much long-standing legislation and policy such as the National Planning Policy Framework (NPPF) have promoted green areas and improved access, with a recent increased emphasis of this across other policies and plans. There is also greater emphasis on future development being more focused towards brownfield sites and urban areas providing greater access to green spaces.</p>

1.3 SOCIO-ECONOMIC

At the time of publishing the Scoping Report, the Yorkshire and the Humber Region had an unemployment rate (aged 16 and over) of 3.8% in the data published from September to November 2021. This was 0.3% below the UK average of 4.1%. At the time of publishing the Draft Environmental Report, the Yorkshire and the Humber Region had an unemployment rate (aged 16 and over) of 4.6%, in the data published from February to April 2022, this is 0.8% higher than the UK average of 3.8%⁹. Although the data is small, this does suggest a negative trend for the region against a slight improvement nationally. Please note unemployment is only one indicator of economic health and inactivity rates are considered separate to unemployment figures.

The English Indices of Multiple Deprivation (IMD) measures relative levels of deprivation in over 30,000 small areas or neighbourhoods, formally called Lower-layer Super Output Areas, in England. The 2019 IMD collects data from seven domains including income, employment, education, health, crime, barriers to housing/ services and living environment, which collectively give each neighbourhood a ranked score. Yorkshire and the Humber has a number of areas within the most deprived 10% of this national rank system, predominantly urban areas within the Calder (Halifax and Wakefield); Colne & Holme Valleys (Huddersfield); Dearne (Barnsley); Hull; Lower Don (Doncaster and Rotherham); Leeds; Sheffield; and Upper Aire (Bradford) SPA's. There are also deprived areas within smaller population centres, especially some of the coastal communities and legacy coal mining communities.

Overnight tourism has been estimated for each region in the UK by Visit Britain with a breakdown of tourism trips by region of residence and region visited (millions). Yorkshire and the Humber had over 9.6 million overnight trips in 2019¹⁰. This figure is higher than North East England, the East Midlands, the West Midlands. It is approximately the same as East England, and lower than London, North West England, the South East, and the South West. When considering overnight tourism, 26% of trips were from residents of the region. Only London and Wales had lower percentages of residents from their respective regions. This perhaps reflects the pull factor of the region with its abundance of beautiful landscapes and protected areas alongside major cities and coastal communities.

⁹ ONS (2022) Labour market in the regions of the UK: June 2022, Available from: [Labour market in the regions of the UK - Office for National Statistics](#), accessed June 2022.

¹⁰ Visit Britain (2019) Available from: [Great British Tourist Report 2019 \(visitbritain.org\)](#) , accessed May 2022.

There is one major international airport in the region, Leeds & Bradford Airport. There are further major international airports near the Level 1 Region, including Teesside International (formerly called Durham Tees Valley) and Doncaster Sheffield Airport (formerly called Robin Hood Airport). There are numerous major A Roads and motorways within the region as well as an important rail network.

The Yorkshire Region includes some major ports including the Ports of Goole and Hull which are part of the Humber Estuary and is the “UK’s busiest port complex which combined handles around 17% of the nation’s trade”¹¹. “The port of Hull handles approximately 10 million tonnes of cargo, amounting to around £12 billion in trade each year”¹². “The port is connected by dual carriageway road links to the M62 and then M18 and M1, to service the whole of the British Isles. It is also connected to the inland waterways system”¹².

LIKELY FUTURE WITHOUT THE PLAN
<p>Uncertainty over inflation, the cost-of living crisis, recent inflationary pressures, and government debt incurred during Covid-19 may impact the economy for years to come. The impact of Brexit may especially affect communities reliant on the economic presence resulting from ports, although the Humber was announced as a freeport in March 2021 which is anticipated to bring benefits¹³.</p> <p>Employment and wider economic inactivity rates in the future are uncertain owing to the circumstances listed above, as is the regional variation within the UK. Government focus on levelling up has been prominent but so far this is not directly reflected within many plans or policies.</p> <p>Investment in infrastructure is likely to remain moderate to high in the medium-term with optioneering currently underway for upgraded and new infrastructure.</p>

1.4 CARBON & MATERIAL ASSETS

Population growth in the region is lower than the English national average; however, development will be required to meet the anticipated growth. This is likely to increase pressure on land use. Nationally there is a preference within policy for sustainable use of land through reuse and intensification of previously developed land, i.e., brownfield development; as well as sustainably locating development close to services, facilities, and sustainable transport. Green Belt plays an important role in planning and primarily aims to reduce urban sprawl. Large areas of Green Belt surround towns and cities such as Bradford, Leeds, Sheffield, and York. The complete list of local authorities with Green Belt that intersects the Level 1 Region includes: *Barnsley; Bolsover; Bradford; Calderdale; Chesterfield; Doncaster; Hambleton; Harrogate; Kirklees; Leeds; North East Derbyshire; Oldham; Pendle; Rochdale; Rossendale; Rotherham; Ryedale; Selby; Sheffield; Wakefield; and York.*

Waste is a serious issue for all regions of the UK both in the short and long term. Use of waste hierarchy principles, such as reuse and recycle, has improved greatly in recent decades with still much work to be done. Resource use refers to what assets will be built from, considering raw material scarcity, recycling, and embodied carbon. It also refers to where assets will be built factoring in promotion of site reuse where practicable.

Average recycling/ composted rates for local authority collected waste in Yorkshire and the Humber for 2019/20 was 43.6% which was marginally higher than the average for England of 42.8%, with

¹¹ Humber Freeport (2022) Britain’s Global Gateway, available from: <https://humberfreeport.org/about/>, accessed May 2022.

¹² Associated British Ports (No Date, *post 2017*) Locations: Hull, available from: <https://web.archive.org/web/20200622180834/https://www.abports.co.uk/locations/hull/>, accessed May 2022.

¹³ GOV.UK (2022) Freeports Guidance. Available from: [Freeports - GOV.UK \(www.gov.uk\)](https://www.gov.uk/freeports), accessed May 2022.

Appendix C – Environmental Baseline

landfill at 4.3%, under the English average of 8.5%¹⁴. There were 236 permitted waste sites on the Environment Agency records for authorised landfill¹⁵ within the Level 1 Region, although some of these are likely to have expired. Landfill Sites are becoming more difficult to source nationally, and historically the Northern England has used many former quarries.

Yorkshire is an important economic region within the UK and the desire to grow the economy adds pressure to energy and resource demand, although the growth in renewables could offset some pressures.

The Yorkshire & Humber Climate Commission states that as a region, “we have a target of reaching net zero carbon emissions by 2038, with significant progress being achieved by 2030”¹⁶. The South Yorkshire Combined Authority “are working towards being net zero carbon emissions by 2040”¹⁷. The West Yorkshire Combined Authority and the Leeds City Region Enterprise Partnership “are working towards being a net zero carbon economy by 2038, and to have made significant progress by 2030”¹⁸. North Yorkshire County Council has committed to “an aspiration to achieve net carbon neutrality by 2030” for all council services from lighting to schools and waste disposal¹⁹.

YW have made a carbon net zero commitment: “Yorkshire Water is on its way to reach carbon net zero by 2030. It is one of three water companies driving a world leading industry group in setting out its route map to reaching the net zero milestone in the next ten years”²⁰.

Air quality is varied across the Level 1 Region with higher concentrations of air pollutants found in more urban areas, usually resulting from transport or industrial production. Domestic energy use predominantly releases air pollution at the generating source, such as power stations which are usually located outside of urban areas.

Air Quality Management Areas (AQMAs) are declared where the national air quality objectives are not being met. AQMAs are predominately designated for Nitrogen dioxide (NO₂) and Particulate Matter (PM10). There are 65 AQMAs that intersect the Level 1 Region. The following lists the AQMAs of relevance by number per local authority.

- Barnsley – 6
- Bolsover – 2
- Calderdale – 8
- Chesterfield – 1
- City of Bradford – 4
- Doncaster – 7
- Hambleton – 1
- Harrogate – 4
- Kingston upon Hull – 1

¹⁴ Defra (2021) Statistics on waste managed by local authorities in England in 2019/2020, available from: [Statistics on waste managed by local authorities 2019 \(publishing.service.gov.uk\)](#), accessed April 2022.

¹⁵ Environment Agency (2022) Defra Data Services Platform, accessed April 2022.

¹⁶ Yorkshire & Humber Climate Commission (2021) Climate Action Plan, available from: <http://yorksandhumberclimate.org.uk/climate-action-plan>, accessed June 2022.

¹⁷ The South Yorkshire Combined Authority (2022) Energy and Greener Future Strategy <https://southyorkshire-https://southyorkshire-ca.gov.uk/explore/energy-greener-future>, accessed June 2022.

¹⁸ West Yorkshire Combined Authority (2020) Emission Reduction Pathways report, available from: <https://www.westyorks-ca.gov.uk/media/4268/emission-reduction-pathways-report.pdf>, accessed June 2022.

¹⁹ North Yorkshire County Council (2022) Beyond Carbon, available from: <https://www.northyorks.gov.uk/beyond-carbon>, accessed May 2022.

²⁰ Yorkshire Water (2020) Yorkshire Water makes headway on route map to carbon net zero, available from: <https://www.yorkshirewater.com/news-media/news-articles/2020/route-map-to-carbon-net-zero/#:~:text=Yorkshire%20Water%20is%20on%20its%20way%20to%20reach,net%20zero%20milestone%20in%20the%20next%20ten%20years>, accessed May 2022.

- Kirklees – 9
- Leeds – 1
- Rochdale – 1
- Rotherham – 7
- Ryedale – 1
- Scarborough – 1
- Selby – 1
- Sheffield – 1
- Wakefield – 8
- York – 1

LIKELY FUTURE WITHOUT THE PLAN

The Government's National Infrastructure Strategy (2020) outlines a legal commitment to decarbonise the economy by 2050, strategies to rebuild the economy following the COVID-19 pandemic and plans to 'level-up' UK cities and regional powerhouses.

Many local, regional, and national policies and plans have ambitious targets to improve air quality, particularly in urban areas. Some urban areas are proposing clean air emission zones such as Bradford in 2022, with further areas anticipated to follow in the near future.

Regeneration and investment are likely to increase the number and quality of material assets including transport infrastructure, recycling facilities, and building efficiency.

1.5 WATER RESOURCES

In general, annual rainfall is lower in the east of England compared to the west of England. Supply demand status for Water Resource Zones (WRZs) across the region shows that as of 2021, Yorkshire Grid SWZ (Surface Water Zone), and Yorkshire East SWZ are areas of surplus²¹, although Yorkshire Grid SWZ was revised to deteriorating surplus/ risk of deficit, with the dual impacts of increased demand and climate change driving this. Further WRZ marginally intersect the Level 1 Region including Kielder (Northumbrian Water); Nottinghamshire (Severn Trent Water); Strategic Grid (Severn Trent Water); and UU-Strategic (United Utilities)²². If water usage increases this is likely to place additional pressures on wastewater treatment which can also be energy intensive.

The Humber River Basin District (RBD) is designated under the Water Framework Directive and covers an area of 26,100km², extending from North Yorkshire in the north to Birmingham in the south, and Staffordshire in the west to the North Sea, and parts of Lincolnshire and East Riding of Yorkshire in the east²³. There are 15 management catchments that make up this RBD, which include interconnected rivers, lakes, groundwater, estuaries, and coastal waters. In total more than 10.8 million people live and work in towns and cities within the district. Each RBD features numerous water bodies with assessed status for ecological, biological, and chemical indicators. The RBD had 32 water bodies that failed for chemical status and 168 water bodies with either a bad or poor ecological status/ potential, from a total of 987. Small sections of the Level 1 Region intersect the North West RBD, Northumbria RBD, and Solway Tweed RBD.

²¹ Water Resources North (2021) Revised Water Resources Position Statement, available from: [wren-report-feb21-final.pdf \(waterresourcesnorth.org\)](https://www.waterresourcesnorth.org/wren-report-feb21-final.pdf), accessed April 2022.

²² Defra (2021) Spatial Download for WRZ. Available from: [Defra Spatial Data Download](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/718328/Humber_RBD_Part_1_river_basin_management_plan.pdf), accessed April 2022.

²³ Environment Agency (2015) RBMP, available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/718328/Humber_RBD_Part_1_river_basin_management_plan.pdf, accessed April 2022.

There are only approximately 200 rivers globally recognised as chalk streams, and over 80% of them are in the UK, including some within East Yorkshire (within the counties of North Yorkshire and the East Riding of Yorkshire). Chalk streams rise from springs found in chalk bedrock and owing to this do have low levels of sediment making them mostly clear. Due to the specialist conditions, “a range of aquatic plants associated with winterbourne and perennial chalk streams can be found including pond water crowfoot (*Ranunculus peltatus*), water cress (*Rorippa nasturtium-aquaticum*), fools water cress (*Apium nodiflorum*), water speedwell (*Veronica anagallis-aquatica*) and water mint (*Mentha aquatic*)”²⁴.

To demonstrate the use of the river beach at Ilkley by swimmers and thus promote good water quality, part of the River Wharfe became the first river bathing site in England in 2021. Further sites along coastal areas are also designated as bathing sites (their locations are updated on the Defra website each bathing season, for example the 2022 list was released in May 2022²⁵).

LIKELY FUTURE WITHOUT THE PLAN
<p>The anticipated population growth alongside the desires for economic growth will likely increase stress on water availability and the natural environment. The effects are likely to be amplified by climate change such as through changing rain patterns, higher temperatures creating and increased drought.</p> <p>Increased population in the region is likely to increase wastewater treatment requirements. The continued issue of plastics entering watercourses, and ultimately the global ocean system, is likely to grow in prominence given plastic properties of slow decomposition.</p>

1.6 FLOOD RISK

Flood risk across the Level 1 Region differs and can occur from a wide range of sources including fluvial, coastal, groundwater, reservoir, sewer, and surface water. Climate change is expected to result in more extreme weather events; increased sea levels; and changes to rainfall and temperature which could all impact on the future flood risk which makes assessing flood risk against historical data more difficult.

Research to inform the UK’s third national climate change risk assessment found that the risk of flooding from all sources is increasing²⁶. Key findings from the report are set out in the bullets below:

- Yorkshire is especially vulnerable to the significant increase in coastal flood risk caused by sea level rise, owing largely to the Holderness geology which was outlined in the Biodiversity & Geodiversity section.
- Many (but not all) rivers in the region will see an increase in peak flows of between 5-15%, with several larger rivers seeing increases of 15-25% under a 4°C rise in global temperature. A 20% increase in peak river flow decreases a 1 in 200-year flood defence to approximately a 1 in 72-year protection.

²⁴ Hull and East Riding Catchment Partnership (2021) ‘Chalkshire’ Britain’s Most Northerly Chalk Outcrop Yorkshire’s Hidden Landscape, available from: [210701-Chalkshire-Report-FINAL-JT.pdf \(catchmentbasedapproach.org\)](https://www.catchmentbasedapproach.org/), accessed April 2022.

²⁵ Defra (2022) List of current bathing waters (2021 bathing season), available from: <https://www.gov.uk/government/publications/bathing-waters-list-of-designated-waters-in-england/list-of-current-bathing-waters-2019-bathing-season.accessed> June 2022.

²⁶ Sayers and Partners (2020) Third UK Climate Change Risk Assessment (CCRA3) Future flood risk, available from: <https://www.ukclimaterisk.org/wp-content/uploads/2020/07/Future-Flooding-Main-Report-Sayers-1.pdf>, accessed April 2022.

- Out of the top 20 national local authorities with the highest future expected economic damages from all sources of flooding, five are in Yorkshire; namely, Hull, Sheffield, Kirklees, Leeds, and Calderdale. Hull is nationally the local authority with the highest future risk, and costs, and is the second highest for deprivation, meaning its residents are less able to adapt to events, recover from them, or have flood insurance.
- Yorkshire Water has the highest future flood risk (assuming no additional action) out of all the water companies.
- Yorkshire also has the highest hectareage of Best and Most Valuable Land at risk from flooding, around 60,000ha at risk from frequent flooding (more frequent than 1 in 30) under a 2°C increase, and more than 80,000ha at risk under a 4°C increase.
- The region has the highest number of Category A infrastructure sites at flood risk.

The YW area of operation predominantly intersects the Humber RBD. Almost 300,000 properties in the RBD receive direct flood warnings²⁷. The characteristics of the Level 1 Region mean that different catchments present varied issues, with upland catchments predominantly in the west often designated as rapid response areas owing to steep topography, and urban areas accentuating the risk of flash flooding. In the east, and along the Humber Estuary, there are lowlands which are only a few metres above sea level and the Holderness Coastline has one of the highest erosion risks in the UK. Thousands of residential and non-residential properties in the RBD benefit from river flood risk management schemes. Coastal and tidal defences also protect many thousands of properties, including in Hull and towns along the Humber Estuary. “The total length of coastal and tidal defences across the river basin district is approximately 2,100km”²⁷.

The Environment Agency and local authorities also manage and seek to reduce flood risk through the planning system. There are multiple Environment Agency Main Rivers and ordinary watercourses within the Level 1 Region which have flood zones with planning guidance on development and the requirements for further study such as Flood Risk Assessments. Where appropriate for the DWMP, Flood Zones and updated Flood Map for Surface Water (uFMfSW) outlines will be investigated in greater detail post the SEA where assessment is undertaken on Level 3 catchments.

YW manages flooding from the sewer network and there is an ongoing programme to renew and replace sewers to reduce the risk of sewer flooding through the current AMP period, and into the future. YW works with partners such as local authorities and the Environment Agency to investigate how to manage and reduce flood risk in a coordinated way. Planning guidance promotes sustainable drainage to decrease volume and velocity of water entering the sewer network.

LIKELY FUTURE WITHOUT THE PLAN

Climate change is likely to result in changing rainfall patterns in terms of volume and intensity. Flood risk can be affected by either factor, or in-combination. Climate change could also make it more difficult to accurately predict flood events as historical data becomes less relevant, although modelling technique improvements will mitigate this to some extent.

The Government’s 25-year Environment Plan looks to strengthen policy including National Planning Policy Framework (NPPF) guidance regarding development in relation to flood risk. Sustainable solutions and those with wider green benefits are promoted, and these also fit with the strategic direction of YW policy.

²⁷ Environment Agency (2016) FRMP: Humber River Basin Summary. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/507114/LIT_10204_HUMBER_FRMP_SUMMARY_DOCUMENT.pdf, accessed May 2022.

1.7 HERITAGE

The DWMP options have the potential to impact heritage assets, including built heritage and its setting, archaeological remains (and their setting), and the historic landscape character, particularly where these are related to the water environment or may be affected by drainage measures. Archaeological remains are sensitive to changes relating to land use, water quality and water levels.

A World Heritage Site (WHS) is a natural or man-made site, area, or structure recognized as being of outstanding international importance. Two WHS are within the Level 1 Region, and these are Saltaire; and Studley Royal Park including the ruins of Fountains Abbey, both have associated buffer zones. Saltaire is an “exceptionally complete and well-preserved industrial village of the 19th century”, located on the river Aire in West Yorkshire with influence on both urban planning and social welfare in the UK and abroad²⁸. Studley Royal Park, including the ruins of Fountains Abbey is situated in North Yorkshire. It is an “18th century designed landscape which features buildings, gardens, and landscapes representing over 800 years of human ambition, design, and achievement” and “is one of the few great 18th century gardens to survive substantially in its original form”²⁹.

A Scheduled Monument is a nationally important archaeological site or historic building, given protection against unauthorised change. There are 2,478 Scheduled Monuments in the Level 1 Region, and they are distributed across the region.

The Protection of Wrecks Act (1973) allows the Government to designate a wreck to prevent uncontrolled interference. Two protected wrecks are located along the coastline, namely, SM UC-70 (1446103), and Filey Bay Wreck (1000080).

There are seven Registered Battlefields within the Level 1 Region. These are:

- Battle of Adwalton Moor 1643
- Battle of Boroughbridge 1322
- Battle of Marston Moor 1644
- Battle of Myton 1319
- Battle of Northallerton 1138
- Battle of Stamford Bridge 1066
- Battle of Towton 1461

There are 29,469 listed buildings within the Level 1 Region. Of these, 626 are Grade I listed which is for a building or structure of exceptional interest. The remaining 28,843 are Grade II or II* listed. Nationally, only 2.5% of listed buildings are Grade I. Listing is not a preservation order, preventing change; however, it means that listed building consent must be applied for to make any changes to that building which might affect its special interest or setting.

There are 129 Registered Parks & Gardens within the Level 1 Region, 11 of which are Grade I listed with the remainder either Grade II or II*. These sites are a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the landscapes' special character.

²⁸ UNESCO (No Date) Saltaire, available from: <https://whc.unesco.org/en/list/1028>, accessed April 2022.

²⁹ UNESCO (No Date) Studley Royal Park including the Ruins of Fountains Abbey, available from: <https://whc.unesco.org/en/list/372>, accessed April 2022.

Other historical sites such as Conservation Areas, Archaeological Protection/Notification Areas, non-designated assets identified on local lists, and more, may be designated under categories not set out above and heritage advice should be sought (local authorities, county archaeologists, etc.) for future specific optioneering and any subsequent planning requirements.

LIKELY FUTURE WITHOUT THE PLAN
Some heritage assets have faced and survived significant climatic changes from the past and are likely to demonstrate resilience to climate change impacts. However, other historic assets may be at greater risk from the direct impacts of future climate change, through flooding, sea level change, storms, and other factors ³⁰ .

1.8 LANDSCAPE

Three National Parks are located within the Level 1 Region. National parks are areas of relatively undeveloped and scenic landscapes designated by national government. Water companies have a statutory duty to have regard to the protection of national parks in carrying out their functions as water undertaker. The Peak District National Park intersects four Level 2 SPAs; namely, Colne & Holme Valleys, Dearne, Rother & Doe Lea, and Sheffield. The North York Moors National Park intersects three Level 2 SPAs; namely, Derwent & Rye, Esk & Coast, and the Upper Dales. The Yorkshire Dales National Park intersects three Level 2s: Lower Dales; Upper Aire; and Upper Dales. Note, buffers for development/ consultation in National Parks can extend beyond the boundary.

An Area of Outstanding Natural Beauty (AONB) is a designated exceptional landscape whose distinctive character and natural beauty are precious enough to be safeguarded in the national interest. AONB are protected and enhanced for nature, people, business, and culture. Three AONB are located within Level 1 Region, and these are North Pennines, Nidderdale, and Howardian Hills. Each national AONB has a Management Plan, or plan of a similar name, which describes the area and identifies future trends and opportunities with actions.

The North Pennines AONB is “one of England’s most special places – a peaceful, unspoilt landscape with a rich history and vibrant natural beauty featuring tumbling waterfalls, sweeping moorland views, dramatic dales, stone-built villages, and snaking stone walls”³¹. The North Pennines includes parts of the Pennine Dales Environmentally Sensitive Area.

The Howardian Hills AONB form a distinctive, roughly rectangular area of well-wooded undulating countryside that rise, sometimes sharply, between the flat agricultural Vales of Pickering and York. The area is famous as the setting for a remarkable concentration of fine country houses, whose parklands are an intrinsic part of the landscape³². The Nidderdale AONB is located on the eastern flanks of the Yorkshire Pennines stretching from the high moorland of Great Whernside south and east towards the edge of the Vale of York. The landscape is dominated by millstone grit geology giving it a typically dark, sometimes sombre appearance which is reflected in the stone of buildings and walls, in the heather moorland and in the characteristic grasslands. Glaciation and the differential resistance to weathering has produced some of the most dramatic features such as cut off crags on

³⁰ English Heritage, [now Historic England] (2010) Climate Change and the Historic Environment, accessed May 2022.

³¹ Landscapes for Life (2022) Available from: [North Pennines Area of Outstanding Natural Beauty \(landscapesforlife.org.uk\)](https://landscapesforlife.org.uk/north-pennines), accessed May 2022.

³² Landscapes for Life (2022) Available from: <https://landscapesforlife.org.uk/about-aonbs/aonbs/howardian-hills>, accessed May 2022.

valley sides and wide U-shaped valleys. This is in contrast with the pastoral landscapes of the dales and upland fringes³³.

Part of the Yorkshire Wolds is being considered for designation as an Area of Outstanding Natural Beauty. The Yorkshire Wolds is a tranquil landscape, known for steep sided dry dales, high but gentle escarpments, dramatic coastal cliffs, and open, rolling agricultural plateaus. Natural and cultural heritage in the area includes ancient woodland, species rich grasslands, chalk streams, Iron Age settlements, abandoned Medieval villages and Georgian manors and parkland. It includes a prominent chalk escarpment and foothills rising from the Vale of York to the west and the Vale of Pickering to the north.

Natural England has defined a series of Natural Character Areas (NCA) to conserve nature in England. They are areas of countryside identified by the unique combination of physical attributes, wildlife, land use and culture; 21 intersect the Level 1 area, and a description of each is presented below in **Table 3**.

Table 3 – Applicable NCA

Name	Description
Tees Lowlands ³⁴	The mosaic of intertidal and wetland habitats within the Tees Estuary are internationally designated as Teesmouth and Cleveland Coast Special Protection Area and Ramsar site, due to their importance for waterfowl.
North Pennines ³⁵	Expansive moorlands, grasslands and meadows are important features and upland bogs and acid grassland cover much of the area. The area attracts large numbers of insects, waders, and birds of prey.
Pennine Dales Fringe ³⁶	Rolling landscapes where the Pennines and Yorkshire Dales transition. Broadleaved woodlands (many of them of ancient origin), coniferous and mixed plantations, and numerous small woods and hedgerow trees all contribute to the well-wooded character of the area.
Yorkshire Dales ³⁷	An undulating upland landscape with peatland and moorland common. Geologically important landforms are present with many from glacial periods. There are numerous habitats of importance and over two thirds are within National Park land.
North York Moors and Cleveland Hills ³⁸	Large open heather moorlands which support many protected species. Some 85 per cent of the area falls within the North York Moors National Park.
Vale of Mowbray ³⁹	Drained by the River Swale and its tributaries the River Wiske and the Cod Beck, meandering through flood plains with remnant rough-grazed riverine meadows of high ecological value in the north of the vale. Woodland and tree cover is sparse: small game coverts and parkland landscapes contribute locally to the tree cover.
Bowland Fringe and Pendle Hill ⁴⁰	A landscape that wraps around the dramatic upland core of the Bowland Fells including the Forest of Bowland AONB (Area of Outstanding Natural Beauty). It is a diverse landscape of herb-rich hay meadows – several of which are nationally and internationally designated – lush pastures, broadleaved woodland, parkland and waterbodies.
Dark Peak ⁴¹	A landscape of large-scale sweeping moorlands, in-by pastures enclosed by drystone walls, and gritstone settlements, within the Pennines. It falls almost entirely within, and forms a large part of, the Peak District National Park and approximately 46% of the area has been designated as a Special Protection Area/ Special Area of Conservation.

³³ Landscapes for Life (2022) Available from: <https://landscapesforlife.org.uk/about-aonbs/aonbs/nidderdale>, accessed January 2022.

³⁴ Natural England (2013), Tees Lowlands, available from: [NCA Profile: 23 Tees Lowlands - NE439 \(naturalengland.org.uk\)](https://www.naturalengland.org.uk/publications/nca/tees_lowlands.aspx), accessed February 2022.

³⁵ Natural England (2013), North Pennines, available from: [http://publications.naturalengland.org.uk/publication/5682293?category=587130](https://www.naturalengland.org.uk/publications/nca/north_pennines.aspx), accessed February 2022.

³⁶ Natural England (2013), Pennine Dales Fringe, available from: [NCA Profile: 22 Pennine Dales Fringe - NE474 \(naturalengland.org.uk\)](https://www.naturalengland.org.uk/publications/nca/pennine_dales_fringe.aspx), accessed February 2022.

³⁷ Natural England (2013), Yorkshire Dales, available from: [NCA Profile: 21. Yorkshire Dales - NE399 \(naturalengland.org.uk\)](https://www.naturalengland.org.uk/publications/nca/yorkshire_dales.aspx), accessed February 2022.

³⁸ Natural England (2012), North York Moors and Cleveland Hills, available from: [NCA Profile: 25 North York Moors and Cleveland Hills - NE352 \(naturalengland.org.uk\)](https://www.naturalengland.org.uk/publications/nca/north_york_moors_and_cleveland_hills.aspx), accessed February 2022.

³⁹ Natural England (2013), Vale of Mowbray, available from: [http://publications.naturalengland.org.uk/publication/9856012](https://www.naturalengland.org.uk/publications/nca/vale_of_mowbray.aspx), accessed February 2022.

⁴⁰ Natural England (2013), Bowland Fringe and Pendle Hill, available from: [http://www.naturalengland.org.uk/publications/nca/bowland_fringe_and_pendle_hill.aspx](https://www.naturalengland.org.uk/publications/nca/bowland_fringe_and_pendle_hill.aspx), accessed February 2022.

⁴¹ Natural England (2012), Dark Peak, available from: [http://www.naturalengland.org.uk/publications/nca/dark_peak.aspx](https://www.naturalengland.org.uk/publications/nca/dark_peak.aspx), accessed February 2022.

Appendix C – Environmental Baseline

Derbyshire Peak Fringe and Lower Derwent⁴²	A picturesque transitional area between the Peak District National Park to the west and the largely urban, historic mining communities to the east. The rivers are of major importance as they drain large volumes of water from the Peak District and the River Derwent has been significant to the area's economic and industrial heritage.
Holderness⁴³	A largely rural, low-lying, undulating plain with coastal communities. To the east, lies a coastline made up of soft boulder clay cliffs. Rapid erosion of these cliffs' forms a part of important coastal processes of sediment transfer within, and to areas south of the River Humber.
Howardian Hills⁴⁴	A clearly defined belt of irregular, rounded ridges with intervening sheltered valleys, diverse woodlands, historic buildings, parklands, and arable land. Three-quarters is within the Howardian Hills AONB, which lies to the south-west of the North York Moors National Park.
Humber Estuary⁴⁵	Covers the open and expansive waters of the River Humber where it meets the North Sea. Several major rivers flow into the Humber, collectively draining one-fifth of England. A low-lying estuarine landscape, with extensive stretches of intertidal habitats including mudflats, salt marsh and reedbeds, coastal dunes and wetlands.
Humberhead Levels⁴⁶	A flat, low-lying, and agricultural landscape bounded to the west by Southern Magnesian Limestone and to the east by the Yorkshire Wolds (north of the Humber). To the north it merges into the slightly undulating landscape of the Vale of York.
Lancashire Valleys⁴⁷	The Lancashire Valleys broadly consist of the rivers Ribble and Calder and their tributaries, running north-east to south-west between the natural backdrops of Pendle Hill and the Southern Pennines. This landscape has a strong urban character.
Nottinghamshire, Derbyshire, and Yorkshire Coalfield⁴⁸	Widespread industrialisation and human development on the landscape pattern is clear, influencing both the visual and ecological landscape. Over half of the NCA (64%) is currently designated as greenbelt; this maintains some distinction between settlements.
Southern Magnesian Limestone⁴⁹	The geology has influenced landscape, from use of its limestone resource as a local building material, to the specialised limestone grasslands. The presence of the limestone ridge, and the drift deposits covering much of it, has produced fertile soils that have attracted settlement for more than 13,000 years.
Southern Pennines⁵⁰	Part of the Pennines, lying between the Peak District and Yorkshire Dales National Parks. This landscape features moorlands, pastures enclosed by drystone walls, and gritstone settlements contained within narrow valleys. The area contains internationally important moorland habitats which support rare birds.
Vale of York⁵¹	An area of flat, low-lying land, surrounded by higher land to the north, east and west. Good quality soils mean farming is the predominant land use. A key feature is the rivers that drain surrounding high land and run southwards towards the Humber, with legacy flooding.
Vale of Pickering⁵²	A low-lying basin of gently undulating topography, lying between North Yorkshire's uplands, and the Scarborough coast to the east. It has physical links with many surrounding areas, particularly through river catchments and has a large presence of ecological protected sites.
Pennine Fringe⁵³	A transitional landscape from upland areas of the Pennines through to the low-lying land of the Nottinghamshire, Derbyshire and Yorkshire Coalfield NCA to the east. The most striking aspect of the landscape is the mingling of predominantly 'gritstone' industrial towns and villages with the strong valley forms and pastoral agriculture of the Pennines foothills.
Yorkshire Wolds⁵⁴	An arc of high, gently rolling ground extending from the Humber Estuary west of Hull, to the North Sea coast at Flamborough Head. It is a prominent chalk escarpment with foothills rising from the Vale of York and the Vale of Pickering, which fall to the low-lying plain of the Holderness in the east. A small proportion of the area is urban and woodland, with the vast majority of the land being agricultural.

⁴² Natural England (2014), Derbyshire Peak Fringe and Lower Derwent, available from: http://www.naturalengland.org.uk/publications/nca/derbyshire_peak_fringe_and_lower_derwent.aspx, accessed February 2022.

⁴³ Natural England (2013), Holderness, available from: <http://www.naturalengland.org.uk/publications/nca/holderness.aspx>, accessed February 2022.

⁴⁴ Natural England (2013), Howardian Hills, available from: http://www.naturalengland.org.uk/publications/nca/howardian_hills.aspx, accessed February 2022.

⁴⁵ Natural England (2012), Humber Estuary, available from: http://www.naturalengland.org.uk/publications/nca/humber_estuary.aspx, accessed February 2022.

⁴⁶ Natural England (2012), Humberhead Levels, available from: http://www.naturalengland.org.uk/publications/nca/humberhead_levels.aspx, accessed February 2022.

⁴⁷ Natural England (2013), Lancashire Valleys, available from: http://www.naturalengland.org.uk/publications/nca/lancashire_valleys.aspx, accessed February 2022.

⁴⁸ Natural England (2013), Nottinghamshire, Derbyshire and Yorkshire Coalfield, available from: http://www.naturalengland.org.uk/publications/nca/nottinghamshire_derbyshire_and_yorkshire_coalfield.aspx, accessed February 2022.

⁴⁹ Natural England (2013), Southern Magnesian Limestone, available from: http://www.naturalengland.org.uk/publications/nca/southern_magnesian_limestone.aspx, accessed February 2022.

⁵⁰ Natural England (2012), Southern Pennines, available from: http://www.naturalengland.org.uk/publications/nca/southern_pennines.aspx, accessed February 2022.

⁵¹ Natural England (2012), Vale of York, available from: http://www.naturalengland.org.uk/publications/nca/vale_of_york.aspx, accessed February 2022.

⁵² Natural England (2012), Vale of Pickering, available from: http://www.naturalengland.org.uk/publications/nca/vale_of_pickering.aspx, accessed February 2022.

⁵³ Natural England (2013), Yorkshire Southern Pennine Fringe, available from: http://www.naturalengland.org.uk/publications/nca/yorkshire_southern_pennine_fringe.aspx, accessed February 2022.

⁵⁴ Natural England (2012), Yorkshire Wolds, available from: http://www.naturalengland.org.uk/publications/nca/yorkshire_wolds.aspx, accessed February 2022.

Townscape refers to the characteristics of urban areas and this can include the layout, density, and mix of buildings, architecture, and cultural spaces. There is significant diversity across the region, from major industrial heritage cities such as Leeds or Sheffield, market towns such as Skipton or Malton, to popular tourism locations such as Scarborough or Whitby. York City Centre is one example of a location where the townscape (and heritage) will constrain options, particularly where architecture and narrow, cobbled streets would present significant townscape constraint.

Areas of important townscape are often located within conservation areas. Conservation areas exist to manage and protect the special architectural and historic interest of a place that make it unique. Every local authority in England has at least one conservation area, and there are 732 within the Level 1 Region.

LIKELY FUTURE WITHOUT THE PLAN
Planning policy recognises diversity of landscape character and promotes the protection of high value areas and reducing urban sprawl through Green Belts. The NPPF gives protection to the landscapes of greatest value such as National Parks and AONB. Climate change has the potential to impact high value landscapes through changing patterns of rainfall or sea level rise. Climate change can also impact species and habitats that can often play vital roles in helping shape, or bring value, to the highest value, protected landscapes.
Population is expected to increase in the region, this alongside trends observed in Covid-19, such as increased home working, could put increased demand on greenfield development, which in turn will lead to loss of agricultural land.

1.9 CLIMATE CHANGE RESILIENCE

Current scientific data indicates that the UK is continuing to warm because of anthropogenic causes. “The last 30-year period (1991-2020) has been 0.9°C warmer than the preceding 30 years (1961-1990) and the warming trend is evident across all months and all countries in the UK”. “As well as increased temperatures, the UK has been on average 6% wetter over the last 30 years (1991-2020) than the preceding 30 years (1961-1990)”⁵⁵.

The Met Office UK Climate Projections (UKCP) were updated in December 2018 (UKCP18)⁵⁶. The Met Office climate projections cover different levels of global warming and when, or if, these levels are reached will depend on the concentration of greenhouse gases entering the global atmosphere. Data is measured in 7.5-mile-square grids across the UK and results can be searched via a postcode to find the grid closest⁵⁷. York Cathedral was selected at random, as a visibly central point for a regional representation of results with the postcode YO1 7HH used. Selected results included:

- The hottest day in the last 30 years was 33.9°C which could rise to 35.6°C if global temperatures rise by 2°C, and 39.4°C if global temperatures rise by 4°C.
- In the past 30 summers, there were three days above 25°C per month on average. With a 2°C rise, there could be six days rising to 14 days for a 4°C rise.
- In the past 30 years, there were ten rainy days on average per month in summer. If global average temperatures rise by 2°C, this could be nine days per month and with a 4°C rise it could be about seven days.

⁵⁵ Met Office (2021) Climate change continues to be evident across UK. Available from: [Climate change continues to be evident across UK - Met Office](#), accessed May 2022.

⁵⁶ Met Office (2018) UKCP18. Available from: [UK Climate Projections \(UKCP\) - Met Office](#), accessed May 2022.

⁵⁷ BBC News (2021) What will climate change look like near me? Available from: <https://www.bbc.co.uk/news/resources/idt-d6338d9f-8789-4bc2-b6d7-3691c0e7d138>, accessed May 2022.

- On the wettest summer day of the past 30 years, 50mm of rain fell. At a 2°C rise, this could be about 62mm, and at a 4°C rise this could be about 63mm.

LIKELY FUTURE WITHOUT THE PLAN
Government policy and international goals indicate significant cuts in greenhouse gas emissions will start to take place throughout the 2020s as progress is made towards net zero targets in 2040/2050. It is anticipated that there will be a lag between the cut in emissions and a slowdown in the rate of temperature increase; for example, if the world became carbon neutral tomorrow, the climate would continue to change for a period, anticipated to be years/ decades.

1.10 LOCAL AUTHORITIES INTERSECTED

The following, **Table 4**, sets out the 36 local authorities for which the Level 1 Region intersects. Please note, some were identified as intersecting the Level 1 Region but are located at the boundary edge and more realistically are adjacent. All are included for completion purposes.

Table 4 – Local Authorities within the Level 1 Region

Local Authorities which intersect the L1 Region Boundary		
Ashfield	Eden	Ribble Valley
Barnsley	Hambleton	Richmondshire
Bolsover	Harrogate	Rochdale
Bradford	High Peak	Rossendale
Burnley	Kingston upon Hull	Rotherham
Calderdale	Kirklees	Ryedale
Chesterfield	Leeds	Scarborough
Craven	North East Derbyshire	Selby
County Durham	North Lincolnshire	Sheffield
Derbyshire Dales	Oldham	South Lakeland
Doncaster	Pendle	Wakefield
East Riding of Yorkshire	Redcar & Cleveland	York

End of appendix.

Appendix D SEA LEVEL 2 RESULTS



Upper Dales

	Biodiversity and Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
General (Upper Dales)									
Increase treatment capacity	0	0	0	-	++	++	0	0	+
Nature Based Solutions - Wetland	+	+	-	+	++	+++	0	++	+++
Network Storage	-	0		-	++	++	-	-	+
Rationalised assets	-	0	0	-	++	0	-	0	+
Side stream excess flows through passive systems (e.g Reedbed to treat flows)	++	+	0	+	+++	-		+	+
Impermeable area surface water management - SuDS	++	++	+	++	+++	+++	0	++	++
Capture stormwater, treat and use as sub-potable	-	0	-	+	++	++	--	--	+
Catchment partnership support	++	++	++	++	++	++	++	++	++
Impermeable area surface water management – Removal at source	-	0		-	+++	-	-	0	+
Full surface water separation	-	0		-	+++	-	-	0	+
Infiltration Reduction		+		+	+	+			+
Customer Education (blockage)	+	0	+	+++	++	++			++
Misconnection	0	0		0	+	+			
Property level surface water management		-	+	-	-	-	0	-	-
Per capita consumption reduction		0	+	+++	++	+			++

Esk & Coast

	Biodiversity and Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
General (Esk & Coast)									
Increase treatment capacity	0	0	0	-	++	++	0	0	+
Nature Based Solutions - Wetland	+	+	-	+	++	+++	0	++	+++
Network Storage	-	0		-	++	++	-	-	+
Rationalised assets	-	0	0	-	++	0	-	0	+
Side stream excess flows through passive systems (e.g Reedbed to treat flows)	++	+	0	+	+++	-		+	+
Impermeable area surface water management - SuDS	++	++	+	++	+++	+++	0	++	++
Capture stormwater, treat and use as sub-potable	-	0	-	+	++	++	--	--	+

Catchment partnership support	++	++	++	++	++	++	++	++	++
Impermeable area surface water management – Removal at source	-	0		-	+++	-	-	0	+
Full surface water separation	-	0		-	+++	-	-	0	+
Infiltration Reduction		+		+	+	+			+
Customer Education (blockage)	+	0	+	+++	++	++			++
Misconnection	0	0		0	+	+			
Property level surface water management		-	+	-	-	-	0	-	-
Per capita consumption reduction		0	+	+++	++	+			++

Lower Dales

	Biodiversity and Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
General (Lower Dales)									
Increase treatment capacity	0	0	0	-	++	++	0	0	+
Nature Based Solutions - Wetland	+	+	-	+	++	+++	0	++	+++
Network Storage	-	0		-	++	++	-	-	+
Rationalised assets	-	0	0	-	++	0	-	0	+
Side stream excess flows through passive systems (e.g Reedbed to treat flows)	++	+	0	+	+++	-		+	+
Impermeable area surface water management - SuDS	++	++	+	++	+++	+++	0	++	++
Capture stormwater, treat and use as sub-potable	-	0	-	+	++	++	--	--	+
Catchment partnership support	++	++	++	++	++	++	++	++	++
Impermeable area surface water management – Removal at source	-	0		-	+++	-	-	0	+
Full surface water separation	-	0		-	+++	-	-	0	+
Infiltration Reduction		+		+	+	+			+
Customer Education (blockage)	+	0	+	+++	++	++			++
Misconnection	0	0		0	+	+			
Property level surface water management		-	+	-	-	-	0	-	-
Per capita consumption reduction		0	+	+++	++	+			++

Lower Don

	Biodiversity and Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
General (Lower Don)									
Increase treatment capacity	0	0	0	-	++	++	0	0	+
Nature Based Solutions - Wetland	+++	++	-	+	++	+++	0	+++	+++
Network Storage	0	0		-	++	++	0	0	+
Rationalised assets	-	0	0	-	++	0	-	0	+
Side stream excess flows through passive systems (e.g Reedbed to treat flows)	++	+	0	+	+++	-		+	+
Impermeable area surface water management - SuDS	+++	+++	+++	++	+++	+++	0	++	++
Capture stormwater, treat and use as sub-potable	-	0	-	+	++	++	--	--	+
Catchment partnership support	++	++	++	++	++	++	++	++	++
Impermeable area surface water management – Removal at source	-	0		-	+++	-	-	0	+
Full surface water separation	-	0		-	+++	-	-	0	+
Infiltration Reduction		+		+	+	+			+
Customer Education (blockage)	+	0	+	+++	++	++			++
Misconnection	0	0		0	+	+			
Property level surface water management		-	+	-	-	-	0	-	-
Per capita consumption reduction		0	+	+++	++	+			++

Derwant & Rye

	Biodiversity and Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
General (Derwant & Rye)									
Increase treatment capacity	0	0	0	-	++	++	0	0	+
Nature Based Solutions - Wetland	+	+	-	+	++	+++	0	++	+++
Network Storage	0	0		-	++	++	0	0	+
Rationalised assets	-	0	0	-	++	0	-	0	+
Side stream excess flows through passive systems (e.g Reedbed to treat flows)	++	+	0	+	+++	-		+	+
Impermeable area surface water management - SuDS	+++	+++	+++	++	+++	+++	0	++	++
Capture stormwater, treat and use as sub-potable	-	0	-	+	++	++	--	--	+

Catchment partnership support	++	++	++	++	++	++	++	++	++
Impermeable area surface water management – Removal at source	-	0		-	+++	-	-	0	+
Full surface water separation	-	0		-	+++	-	-	0	+
Infiltration Reduction		+		+	+	+			+
Customer Education (blockage)	+	0	+	+++	++	++			++
Misconnection	0	0		0	+	+			
Property level surface water management		-	+	-	-	-	0	-	-
Per capita consumption reduction		0	+	+++	++	+			++

Holderness Coast

	Biodiversity and Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
General (Holderness Coast)									
Increase treatment capacity	0	0	0	-	++	++	0	0	+
Nature Based Solutions - Wetland	+++	++	-	+	++	+++	0	+++	+++
Network Storage	0	0		-	++	++	0	0	+
Rationalised assets	-	0	0	-	++	0	-	0	+
Side stream excess flows through passive systems (e.g Reedbed to treat flows)	++	+	0	+	+++	-		+	+
Impermeable area surface water management - SuDS	+++	+++	+++	++	+++	+++	0	++	++
Capture stormwater, treat and use as sub-potable	-	0	-	+	++	++	--	--	+
Catchment partnership support	++	++	++	++	++	++	++	++	++
Impermeable area surface water management – Removal at source	-	0		-	+++	-	-	0	+
Full surface water separation	-	0		-	+++	-	-	0	+
Infiltration Reduction		+		+	+	+			+
Customer Education (blockage)	+	0	+	+++	++	++			++
Misconnection	0	0		0	+	+			
Property level surface water management		-	+	-	-	-	0	-	-
Per capita consumption reduction		0	+	+++	++	+			++

Lower Ouse

	Biodiversity and Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
General (Lower Ouse)									
Increase treatment capacity	0	0	0	-	++	++	0	0	+
Nature Based Solutions - Wetland	+++	++	-	+	++	+++	0	+++	+++
Network Storage	0	0		-	++	++	0	0	+
Rationalised assets	-	0	0	-	++	0	-	0	+
Side stream excess flows through passive systems (e.g Reedbed to treat flows)	++	+	0	+	+++	-		+	+
Impermeable area surface water management - SuDS	+++	+++	+++	++	+++	+++	0	++	++
Capture stormwater, treat and use as sub-potable	-	0	-	+	++	++	--	--	+
Catchment partnership support	++	++	++	++	++	++	++	++	++
Impermeable area surface water management – Removal at source	-	0		-	+++	-	-	0	+
Full surface water separation	-	0		-	+++	-	-	0	+
Infiltration Reduction		+		+	+	+			+
Customer Education (blockage)	+	0	+	+++	++	++			++
Misconnection	0	0		0	+	+			
Property level surface water management		-	+	-	-	-	0	-	-
Per capita consumption reduction		0	+	+++	++	+			++

Colne and Holme Viley

	Biodiversity and Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
General (Colne and Holme Valleys)									
Increase treatment capacity	0	0	0	-	++	++	0	0	+
Nature Based Solutions - Wetland	+++	++	-	+	++	+++	0	+++	+++
Network Storage	0	0		-	++	++	0	0	+
Rationalised assets	-	0	0	-	++	0	-	0	+
Side stream excess flows through passive systems (e.g Reedbed to treat flows)	++	+	0	+	+++	-		+	+
Impermeable area surface water management - SuDS	+++	+++	+++	++	+++	+++	0	++	++
Capture stormwater, treat and use as sub-potable	-	0	-	+	++	++	--	--	+

Catchment partnership support	++	++	++	++	++	++	++	++	++
Impermeable area surface water management – Removal at source	-	0		-	+++	-	-	0	+
Full surface water separation	-	0		-	+++	-	-	0	+
Infiltration Reduction		+		+	+	+			+
Customer Education (blockage)	+	0	+	+++	++	++			++
Misconnection	0	0		0	+	+			
Property level surface water management		-	+	-	-	-	0	-	G
Per capita consumption reduction		0	+	+++	++	+			++

Upper Aire

	Biodiversity and Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
General (Upper Aire)									
Increase treatment capacity	0	0	0	-	++	++	0	0	+
Nature Based Solutions - Wetland	+++	++	-	+	++	+++	0	+++	+++
Network Storage	0	0		-	++	++	0	0	+
Rationalised assets	-	0	0	-	++	0	-	0	+
Side stream excess flows through passive systems (e.g Reedbed to treat flows)	++	+	0	+	+++	-		+	+
Impermeable area surface water management - SuDS	+++	+++	+++	++	+++	+++	0	++	++
Capture stormwater, treat and use as sub-potable	-	0	-	+	++	++	--	--	+
Catchment partnership support	++	++	++	++	++	++	++	++	++
Impermeable area surface water management – Removal at source	-	0		-	+++	-	-	0	+
Full surface water separation	-	0		-	+++	-	-	0	+
Infiltration Reduction		+		+	+	+			+
Customer Education (blockage)	+	0	+	+++	++	++			++
Misconnection	0	0		0	+	+			
Property level surface water management		-	+	-	-	-	0	-	-
Per capita consumption reduction		0	+	+++	++	+			++

Dearne

	Biodiversity and Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
General (Dearne)									
Increase treatment capacity	0	0	0	-	++	++	0	0	+
Nature Based Solutions - Wetland	+++	++	-	+	++	+++	0	+++	+++
Network Storage	0	0		-	++	++	0	0	+
Rationalised assets	-	0	0	-	++	0	-	0	+
Side stream excess flows through passive systems (e.g Reedbed to treat flows)	++	+	0	+	+++	-		+	+
Impermeable area surface water management - SuDS	+++	+++	+++	++	+++	+++	0	++	++
Capture stormwater, treat and use as sub-potable	-	0	-	+	++	++	--	--	+
Catchment partnership support	++	++	++	++	++	++	++	++	++
Impermeable area surface water management – Removal at source	-	0		-	+++	-	-	0	+
Full surface water separation	-	0		-	+++	-	-	0	+
Infiltration Reduction		+		+	+	+			+
Customer Education (blockage)	+	0	+	+++	++	++			++
Misconnection	0	0		0	+	+			
Property level surface water management		-	+	-	-	-	0	-	-
Per capita consumption reduction		0	+	+++	++	+			++

Rither & Doe Lea

	Biodiversity and Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
General (Rother & Doe Lea)									
Increase treatment capacity	0	0	0	-	++	++	0	0	+
Nature Based Solutions - Wetland	+++	++	-	+	++	+++	0	+++	+++
Network Storage	0	0		-	++	++	0	0	+
Rationalised assets	-	0	0	-	++	0	-	0	+
Side stream excess flows through passive systems (e.g Reedbed to treat flows)	++	+	0	+	+++	-		+	+
Impermeable area surface water management - SuDS	+++	+++	+++	++	+++	+++	0	++	++
Capture stormwater, treat and use as sub-potable	-	0	-	+	++	++	--	--	+

Catchment partnership support	++	++	++	++	++	++	++	++	++
Impermeable area surface water management – Removal at source	-	0		-	+++	-	-	0	+
Full surface water separation	-	0		-	+++	-	-	0	+
Infiltration Reduction		+		+	+	+			+
Customer Education (blockage)	+	0	+	+++	++	++			++
Misconnection	0	0		0	+	+			
Property level surface water management		-	+	-	-	-	0	-	-
Per capita consumption reduction		0	+	+++	++	+			++

Calder

	Biodiversity and Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
General (Calder)									
Increase treatment capacity	0	0	0	-	++	++	0	0	+
Nature Based Solutions - Wetland	+++	++	-	+	++	+++	0	+++	+++
Network Storage	0	0		-	++	++	0	0	+
Rationalised assets	-	0	0	-	++	0	-	0	+
Side stream excess flows through passive systems (e.g Reedbed to treat flows)	++	+	0	+	+++	-		+	+
Impermeable area surface water management - SuDS	+++	+++	+++	++	+++	+++	0	++	++
Capture stormwater, treat and use as sub-potable	-	0	-	+	++	++	--	--	+
Catchment partnership support	++	++	++	++	++	++	++	++	++
Impermeable area surface water management – Removal at source	-	0		-	+++	-	-	0	+
Full surface water separation	-	0		-	+++	-	-	0	+
Infiltration Reduction		+		+	+	+			+
Customer Education (blockage)	+	0	+	+++	++	++			++
Misconnection	0	0		0	+	+			
Property level surface water management		-	+	-	-	-	0	-	-
Per capita consumption reduction		0	+	+++	++	+			++

Lower Aire

	Biodiversity and Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
General (Lower Aire)									
Increase treatment capacity	0	0	0	-	++	++	0	0	+
Nature Based Solutions - Wetland	+++	++	-	+	++	+++	0	+++	+++
Network Storage	0	0		-	++	++	0	0	+
Rationalised assets	-	0	0	-	++	0	-	0	+
Side stream excess flows through passive systems (e.g Reedbed to treat flows)	++	+	0	+	+++	-		+	+
Impermeable area surface water management - SuDS	+++	+++	+++	++	+++	+++	0	++	++
Capture stormwater, treat and use as sub-potable	-	0	-	+	++	++	--	--	+
Catchment partnership support	++	++	++	++	++	++	++	++	++
Impermeable area surface water management – Removal at source	-	0		-	+++	-	-	0	+
Full surface water separation	-	0		-	+++	-	-	0	+
Infiltration Reduction		+		+	+	+			+
Customer Education (blockage)	+	0	+	+++	++	++			++
Misconnection	0	0		0	+	+			
Property level surface water management		-	+	-	-	-	0	-	-
Per capita consumption reduction		0	+	+++	++	+			++

York

	Biodiversity and Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
General (York)									
Increase treatment capacity	0	0	0	-	++	++	0	0	+
Nature Based Solutions - Wetland	+++	++	-	+	++	+++	0	+++	+++
Network Storage	0	0		-	++	++	0	0	+
Rationalised assets	-	0	0	-	++	0	-	0	+
Side stream excess flows through passive systems (e.g Reedbed to treat flows)	++	+	0	+	+++	-		+	+
Impermeable area surface water management - SuDS	+++	+++	+++	++	+++	+++	0	++	++
Capture stormwater, treat and use as sub-potable	-	0	-	+	++	++	--	--	+

Catchment partnership support	++	++	++	++	++	++	++	++	++
Impermeable area surface water management – Removal at source	-	0		-	+++	-	-	0	+
Full surface water separation	-	0		-	+++	-	-	0	+
Infiltration Reduction		+		+	+	+			+
Customer Education (blockage)	+	0	+	+++	++	++			++
Misconnection	0	0		0	+	+			
Property level surface water management		-	+	-	-	-	0	-	-
Per capita consumption reduction		0	+	+++	++	+			++

Sheffield

	Biodiversity and Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
General (Sheffield)									
Increase treatment capacity	0	0	0	-	++	++	0	0	+
Nature Based Solutions - Wetland	+++	++	-	+	++	+++	0	+++	+++
Network Storage	0	0		-	++	++	0	0	+
Rationalised assets	-	0	0	-	++	0	-	0	+
Side stream excess flows through passive systems (e.g Reedbed to treat flows)	++	+	0	+	+++	-		+	+
Impermeable area surface water management - SuDS	+++	+++	+++	++	+++	+++	0	++	++
Capture stormwater, treat and use as sub-potable	-	0	-	+	++	++	--	--	+
Catchment partnership support	++	++	++	++	++	++	++	++	++
Impermeable area surface water management – Removal at source	-	0		-	+++	-	-	0	+
Full surface water separation	-	0		-	+++	-	-	0	+
Infiltration Reduction		+		+	+	+			+
Customer Education (blockage)	+	0	+	+++	++	++			++
Misconnection	0	0		0	+	+			
Property level surface water management		-	+	-	-	-	0	-	-
Per capita consumption reduction		0	+	+++	++	+			++

Leeds

	Biodiversity and Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
General (Leeds)									
Increase treatment capacity	0	0	0	-	++	++	0	0	+
Nature Based Solutions - Wetland	+++	++	-	+	++	+++	0	+++	+++
Network Storage	0	0		-	++	++	0	0	+
Rationalised assets	-	0	0	-	++	0	-	0	+
Side stream excess flows through passive systems (e.g Reedbed to treat flows)	++	+	0	+	+++	-		+	+
Impermeable area surface water management - SuDS	+++	+++	+++	++	+++	+++	0	++	++
Capture stormwater, treat and use as sub-potable	-	0	-	+	++	++	--	--	+
Catchment partnership support	++	++	++	++	++	++	++	++	++
Impermeable area surface water management – Removal at source	-	0		-	+++	-	-	0	+
Full surface water separation	-	0		-	+++	-	-	0	+
Infiltration Reduction		+		+	+	+			+
Customer Education (blockage)	+	0	+	+++	++	++			++
Misconnection	0	0		0	+	+			
Property level surface water management		-	+	-	-	-	0	-	-
Per capita consumption reduction		0	+	+++	++	+			++

Hull

	Biodiversity and Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
General (Hull)									
Increase treatment capacity	0	0	0	-	++	++	0	0	+
Nature Based Solutions - Wetland	+++	++	-	+	++	+++	0	+++	+++
Network Storage	0	0		-	++	++	0	0	+
Rationalised assets	-	0	0	-	++	0	-	0	+
Side stream excess flows through passive systems (e.g Reedbed to treat flows)	++	+	0	+	+++	-		+	+
Impermeable area surface water management - SuDS	+++	+++	+++	++	+++	+++	0	++	++
Capture stormwater, treat and use as sub-potable	-	0	-	+	++	++	--	--	+

Catchment partnership support	++	++	++	++	++	++	++	++	++
Impermeable area surface water management – Removal at source	-	0		-	+++	-	-	0	+
Full surface water separation	-	0		-	+++	-	-	0	+
Infiltration Reduction		+		+	+	+			+
Customer Education (blockage)	+	0	+	+++	++	++			++
Misconnection	0	0		0	+	+			
Property level surface water management		-	+	-	-	-	0	-	-
Per capita consumption reduction		0	+	+++	++	+			++