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DRAFT DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP) 331001729-01-03

FINAL STRATEGIC ENVIRONMENTAL ASSESSMENT – Non-Technical Summary

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ABBREVIATIONS

Abbreviations used:	
AMP	Asset Management Plan (AMP7 period is 2020-2025)
AONB	Area of Outstanding Natural Beauty
AQMA	Air Quality Management Area
BNG	Biodiversity Net Gain
BRAVA	Baseline Risk and Vulnerability Assessment
CU	Coastal Urban
Defra	Department for Environment, Food and Rural Affairs
DSMP	Drainage and Sewerage Management Plan
DWF	Dry Weather Flow
DWMP	Drainage and Wastewater Management Plan
EPA	Environmental Performance Assessment
GhG	Greenhouse Gas
HRA	Habitats Regulations Assessment
HU	Historic Urban
INNS	Invasive non-native species risk assessment
IU	Industrial/ Economic Urban
L1/ L2/ L3	Level 1/ Level 2/ Level 3
LLFA	Lead Local Flood Authority
LR	Lowlands Rural
MCZ	Marine Conservation Zone
NCA	National Character Area
NIDP	Northumbria Integrated Drainage Partnership
NNR	National Nature Reserve
NWG	Northumbrian Water Group
ODA	Option Development and Appraisal
OFWAT	Water Services Regulation Authority

Abbreviations used:	
PO	Planning Objective
PR24	2024 Price Review
PRoW	Public Rights of Way
RBCS	Risk Based Catchment Screening
RBD	River Basin District
RNAGS	Reason for Not Achieving Good (Ecological) Status
SAC	Special Area of Conservation
SEA	Strategic Environmental Assessment
SF	Suburban Fringe
SO	Storm Overflow
SOAF	Storm Overflow Assessment Framework
SODRP	Storm Overflow Discharge Reduction Plan
SPA	Strategic Planning Area (note SPA sometimes also refers to a 'Special Protection Area', but in this report we have not abbreviated the term Special Protection Area)
SPG	Strategic Planning Group
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage System
TPU	Tactical Planning Unit
uFMfSW	updated Flood Map for Surface Water
UK	United Kingdom
UKCP	UK Climate Projections
UR	Uplands Rural
WFD	Water Framework Directive
WHS	World Heritage Site
WwTW	Wastewater Treatment Works

NON-TECHNICAL SUMMARY

This non-technical summary provides an overview of the Strategic Environmental Assessment (SEA) of Northumbrian Water Group's (NWG) new draft Drainage and Wastewater Management Plan (DWMP). It summarises the key issues using non-technical language as far as possible to make the report more accessible. For the full findings, reference should be made to the SEA report.

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. This assessment has been undertaken as best practice, rather than a statutory requirement.

NTS 1.1 Overview of the Plan

The DWMP sets out the long-term investment plan for drainage and wastewater, defining priorities for investment over the next 40 years. It will inform the company business plan submission for PR24 (Price Review 2024) ahead of Asset Management Plan (AMP) 8 for the period 2025 – 2030.

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:

- 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

In addition, NWG have established additional targets:

- reduce internal sewer flooding by 60% between 2030 and 2050; and
- ensure that all wastewater treatment works (WwTWs) are complaint with their Dry Weather Flow (DWF) treated effluent consent values.

The Study Area aligns with the operational boundary for NWG's provision of wastewater services (see **Figure 1.2.1** of the SEA Report). The DWMP considers wastewater and drainage networks (foul, combined and surface water sewers), interconnecting drainage systems (such as highway drains and culverted watercourses), wastewater pumping stations, and wastewater treatment works systems looking at a combination of flooding and environmental impact.

The DWMP has been developed in line with Water UK's: 'A framework for the production of Drainage and Wastewater Management Plans'[1].

NWG 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. NWG has worked with various stakeholders throughout the development of the plan, including the Environment Agency, Lead Local Flood Authorities, Local Planning Authorities, Developers and Environmental Partners.

NTS 1.2 Stages of the SEA and Consultation

The SEA Scoping Report established the context of the plan (the legal, policy and other requirements; the current environmental, social and economic conditions, problems and trends) and proposed the SEA methodology, including SEA Objectives.

The consultation bodies (Natural England, the Environment Agency, and English Heritage), along with wider consultees, were consulted on the Scoping Report for a period of five weeks from **17th January 2022** to **21st February 2022**. Feedback received during consultation has informed the SEA process.

The draft SEA Environmental Report was issued for consultation along with the draft DWMP, for **12 weeks** until **23rd September**, including to the SEA consultation bodies. Responses from different parties were received and have been taken into account in formulating the final DWMP. A summary of the feedback received, and how comments have been addressed, is also included in **Appendix A - Consultation responses** of the SEA report.

NTS 1.3 Key Requirements, Issues and Opportunities

As part of the SEA, relevant plans, programmes and environmental protection objectives relevant to the DWMP were identified, along with the baseline environment and likely future without the plan. These are summarised within **Tables 2.2.1 and 3.2.1** of the SEA report.

A key change since the draft DWMP is the publication of the SODRP on 26 August 2022, aiming to eliminate all harm from storm overflows in the long-term. The SODRP outlines specific and time-bound targets that water companies will deliver, as a minimum.

Climate change and population growth are key factors which are increasing pressure on the wastewater system (and the wider environment), including increased flood risk, a trend which is expected to continue.

These are key issues in relation to water quality, flood risk, biodiversity and human health, which the plan seeks to address.

[1] Water UK (2021) DWMP Framework Guidance, available from: https://www.water.org.uk/wp-content/uploads/2021/10/DWMP_Framework_Report_Main_Report_September_2021.pdf, accessed March 2022.

NTS 1.4 How was the plan assessed?

SEA objectives were developed to state the direction and priorities of the SEA; give a structure to ensure a comprehensive and robust appraisal; and provide the basis for the identification of relevant indicators. They are:

Table NTS 1 – 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

The SEA objectives are developed further into an SEA framework, including guiding questions, that has been used to assess 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.

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.

It is important to note that the assessment has been undertaken at the strategic level, in line with the nature of SEA and the DWMP. 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.

NTS 1.5 Option development and assessment

The DWMP has been produced following a risk and benefits-based approach, following the guidance provided in the DWMP Framework. The criteria considered within this process (such as bathing waters, sewer flooding, storm overflows, population growth) provide a good coverage of the SEA topics, particularly in relation to water resources,

flood risk, climate resilience and biodiversity – reflecting the nature of the plan and its objectives for flood risk, the (water) environment and compliance. 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. Following SEA comments on the draft plan, consideration is now given to carbon through the assessment, a positive improvement from the draft stage. Overall, the SEA topics are well covered within the DWMP development process, demonstrating integrated consideration of the SEA themes throughout the plan production.

The options considered as part of the DWMP have been reviewed through the SEA to ensure all reasonable alternatives have been considered. An initial screening process discarded some options which are not feasible within the area (e.g., transfer of flows to a different catchment), or would not meet the required storm overflow reduction (e.g., water efficiency measures to reduce wastewater flows).

The remaining options (the 'reasonable alternative options') have been appraised using the SEA framework both at plan wide and Level 2 (L2) (see **Tables 5.3.1, 5.3.2** and **5.4.1** of the SEA report).

NTS 1.6 Development and assessment of combined options

To achieve the SODRP targets, a combination of the individual options identified in above is required within catchments. In line with the SEA assessment of individual options, NWG adopted a hierarchy approach where consideration is given first to the reduction in quantity of wastewater, before considering the green options (such as SuDS), with remaining need met through grey options (such as below ground storage). The hierarchy selects option elements in the following order of preference:

1. Residential source control (rainwater harvesting of roof runoff).

2. Commercial property source control (rainwater harvesting of roof runoff).

3. Smart networks to intelligently operate the sewer network to utilise existing capacity within the network.

4. Surface water removal by disconnection of existing separately drained catchments from the combined sewer network (i.e., green options such as SuDS, blue green infrastructure).

5. Separation of highway runoff from the combined sewer network through the provision of new surface water networks.

6. Provision of below-ground storage.

7. Separation of highway runoff from the combined sewer network through the provision of new surface water networks.

For suitable options (i.e., those that meet the SODRP targets), estimated costs and benefits were calculated. Costs are based on whole-life CAPEX and OPEX costs over a 30-year life. All of the options that have been evaluated in the development of the DWMP have been assessed for impact on embodied and operational greenhouse gas emissions.

The carbon impact has been used alongside other factors in the determination of the monetised (dis)benefits provided by each option in the identification of the Best Value option for a catchment. The other monetised benefits include environmental and societal benefits provided through the creation of habitats and green spaces, which have been calculated using the industry standard Benefits of SuDS Tool (B£ST), including:

- Air Quality - Monetary value for pollutant removal by a small tree
- Amenity - Estimated number of residents living on a street that is 'greened'
- Biodiversity and Ecology - Area (ha) of changed land use type
- Carbon Sequestration - Number of trees planted
- Flooding - Health Benefits of reducing flood risk e.g., reduced or avoided stress and anxiety
- Health - number of visits to greenspace per year for physical activity

In addition to the environmental and societal benefits that have been calculated using B£ST, the Multi Coloured Manual Handbook has been used to evaluate annual average flooding damages avoided as a result of an option being implemented. This has been calculated using the Weighted Annual Average Damages (WAAD) approach. The values calculated contribute to the overall benefit of an option, which is used to determine 'Best Value'.

This informs the determination of the 'Best Value' option for storm overflow spill frequency within each L4 drainage community.

The valuation of these environmental and social benefits is a positive improvement since the draft DWMP and in line with recommendations made with the SEA Environmental Report at that stage, embedding these considerations further within decision making.

NWG has considered three scenarios, namely Least Cost Options, Best Value and Alternative Storm Overflow Options in the DWMP, which are developed from the options combination listed in Table 6.1.1. The three scenarios are described in **Table NTS-2**. The Alternative scenario was developed through a manual review of findings to identify alternative green options where the cost difference was minimal but green benefits increased and grey solutions decreased.

Table NTS-2 – DWMP Scenarios Considered

Scenario	Description
Scenario 1: Least Cost Option	This scenario is to meet the requirements to deliver the SODRP targets at the least cost. Reduce internal sewer flooding by 60% post 2030 WwTW DWF compliance options are included.
Scenario 2: Best Value Option	This scenario considers the positive impacts on other planning objectives (such as flooding and pollution) and societal benefits from delivering the SODRP. To determine the best value options, using the assessment of benefits and whole life cost, a cost-benefit ratio was calculated for selection of the best value option. Reduce internal sewer flooding by 60% post 2030. WwTW DWF compliance options are included.

Scenario 3: Alternative Option	As Scenario 2 Best Value, with additional alternative green options where the cost difference was minimal but green benefits increased and grey solutions decreased

NTS 1.7 Summary of the Preferred Plan

NWG has selected the Alternative Options as the Preferred Plan (Scenario 3) to address SODRP targets. This section summarises the Preferred Plan.

The Preferred Plan has been selected to meets the target in the Storm Overflow Discharge Reduction Plan:

Table NTS-3 – Percentage and Number of SOs Improved

Year	2030	2035	2040	2045	2050
% of high priority site storm overflows improved	38% (138)	75% (252)	87% (293)	100% (336)	100% (336)
% of total storm overflows improved	14% (143)	28% (286)	52% (530)	76% (775)	100% (1018)

A marginal increase in expenditure results in a reduction in grey concrete storage solutions, to be replaced by green infrastructure and the removal of surface water from the combined sewer network. This approach reduces storage requirements by 15,200m^3 in the period 2025-2035.

The Preferred Plan includes investment at the four WwTWs predicted to fail the DWF permit compliance in the 2030 planning horizon. A further eight WwTWs are anticipated to fail DWF permit conditions by 2045 or 2050.

The Long-Term Delivery Strategy identifies a target of reducing sewer flooding by 60% from the 2025 position. To achieve this, NWG will plan to reduce hydraulic flood risk by

- 18,017 internal properties, and
- 210,014 external properties

in the period between 2030 and 2050. This approach deals with the impact of climate change, growth and urban creep.

Further measures include:

- the achievement of Technically Achievable Limit (TAL) of Urban Waste Water Treatment Directive (UWWTD) - Nutrient Neutrality on River Tees.
- Six nature-based catchment solutions presented (covering 30 waterbodies and 30 WwTW's) are targeted for improvements in the period 2025-2030.
- Undertaking Continuous River Water Monitoring in line with the Environmental Act
- Commitment to partnership working through the NIDP and improve 500km blue spaces

NTS 1.8 Assessment of the Preferred Approach in the DWMP

This section assess the total effect of the Preferred Plan, and the cumulative effect taking into account the likely future without the plan.

Table NTS 4 and **Table NTS 5** draw together the total effects of the DWMP in combination with the underlying trend, to establish the cumulative effect. The key for **Table NTS 4**:

Assessment key:

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

Table NTS 4 – Summary of total plan effects and cumulative effects

SEA Objective	Total plan effects	Cumulative effects
Biodiversity & Geodiversity	The DWMP prioritises measures where SOs are discharging in or close to high priority sites (as defined by SODRP). This will provide a positive permanent benefit for aquatic biodiversity. As the implementation of the plan progresses, the benefits of the plan will extend across the plan area. WwTW upgrades to cope with additional demand from population growth will prevent damage to aquatic biodiversity from that population increase. The Preferred Plan includes the greatest proportion of 'green' and 'blue-green' infrastructure components of the alterative scenarios. This option offers the potential for long term positive effects on terrestrial biodiversity and geodiversity. 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, their location (providing opportunities to link other habitats) and their design. The construction of below ground storage, surface water management 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 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).	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. Changing climate could impact on the quality of soils across the region through temperature extremes and changing rainfall patterns. Development pressure is likely to increase the risk of habitat loss and fragmentation, particularly outside of the extensive designated areas. Partnership working offers the potential to increase resilience to climate change by allowing the movement of species through the environment and supporting natural soil processes. Reduced spills from SOs and WwTW upgrades will support biodiversity, reducing susceptibility to the above threats.
Human Health	Human health is particularly important in this region where the health of residents is lower than the average for England, life expectancy ranges from 6.6 to 15.26 years lower than the average for England and childhood obesity rates are up to 26.9%. It is anticipated that the human health impact will be neutral during the construction of measures included within the DWMP.	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.

SEA Objective	Total plan effects	Cumulative effects
	SOs discharging to designated bathing waters will be reduced by 2035, providing a permanent positive effect on human health. These measures may increase the uptake of open water swimming, providing further health and well-being benefits. Within the Preferred Plan, NWG set an ambitious goal to eradicate sewer flooding in homes by 2040. This option delivers the SODRP and sewer flooding ambitious goal together by 2040. These provide immediate permanent human health benefits in relation to health (exposure to sewage) and well-being (stress, anxiety). The more 'green' and 'blue-green' infrastructure components (which are greatest in the Preferred Plan) also 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. There is another potential opportunity to provide public access to above below-ground storage assets, such as play areas, gyms, etc (this will be location specific and dependent on design).	The 'green' and 'blue-green' infrastructure components (which are greatest in the Preferred Plan) provide an opportunity to support these measures, improving health and well-being.
Socio-economic	The plan area experiences higher than average levels of unemployment, with a large number of neighbourhoods being the most deprived nationally. 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 until 2050. 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). As such reduced flood risk provides a positive, permanent, long-term effect to a more sensitive population. The Preferred Plan has more 'green' and 'blue-green' infrastructure components than the alternatives, the multi-functional nature of blue/green corridors can provide active travel routes (such as footpaths and cycle paths), increasing low-cost transport options on a permanent basis. Further, improved landscaping can	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 for both scenarios will reduce risks and support a good economic and social environment.

SEA Objective	Total plan effects	Cumulative effects
	have a positive socio-economic impact. Hence the socio-economic is assessed as moderate positive.	
Carbon & Material Assets	Given the scale of below ground infrastructure to be implemented through the plan, there is expected to be a moderate adverse effect on carbon and material assets through the construction of below ground concrete storage, and the subsequent on-going increased wastewater treatment requirements. 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 to provide multiple benefits. The green' and 'blue-green' infrastructure components are typically not resource intensive to construct, operate, or maintain, providing nature-based solutions with wider benefits, including carbon sequestration.	The future trend is towards reducing carbon emissions and increasing resource efficiency, which the below ground storage approach does not necessarily support. The majority of the negative impact is likely to be during the construction phase rather than operation (depending on the amount of pumping and additional treatment that may be required).
Water Resources	The DWMP will result in major 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. 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.	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. Both scenarios have accounted for these pressures and is designed to address them to help address this issue.
Flood Risk	The DWMP will result in major positive permanent effects by reducing internal sewer flood risk.	Flood risk is anticipated to increase as climate change progresses as a result of changing rainfall volumes and intensity. The DWMP accounts for the anticipated changes whilst reducing the risk of sewer flooding to help address this issue.
Heritage	The DWMP is not anticipated to have 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.	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 DWMP will help to address those risks associated with sewer flooding.

SEA Objective	Total plan effects	Cumulative effects
	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.	

NTS 1.9 Measures to Prevent, Reduce & Mitigate Adverse Effects and Enhance Beneficial Effects

Measures have been suggested throughout the SEA process and during revision of the draft DWMP in preparing the final plan. These measures have been detailed in **Section 8.1** of the SEA report**.**

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 8.2.1** of the SEA report.

Table NTS-5 – Measures to prevent, reduce, mitigate and compensate effects during plan implementation

Options	Measures to prevent, reduce, mitigate, compensate
Strategic blue green corridors	Along with water management, blue/green corridors 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. To achieve this, the design will need to take account of more localised issues such as biodiversity value, local connectivity, and locally prepared Landscape Character Assessments. Blue/ green corridors should be designed and implemented following SuDS guidance, including in relation to pollution control and discharge to watercourses and groundwater. Early and effective partnership working is required.
SuDS storage	Along with water management, SuDS features should be designed to achieve multi-functional benefits, including biodiversity, landscape/ townscape, and reducing the urban heat island effect. SuDS features should be designed and implemented following SuDS guidance, including in relation to pollution control and discharge to watercourses and groundwater.
Surface water separation and removal	Reduce the extent of new surface water sewers through use as part of a hybrid solution (such as SuDS features, modification of upstream watercourses, rain gardens etc). Such an approach would provide the opportunity for wider enhancements, such as for biodiversity. Design new surface water sewers in a manner which slows the flow of water to the receiving environment. Where water quality allows and where feasible, promote discharge to surface waters 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. Further catchment specific assessments are required to identify the most appropriate routing, design and construction methods for the new sewer route and outfall. Cost and programme allowance should include for this, including

	issues such as ecology, heritage, consenting (e.g., discharge consents[2]) 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. Reducing the extent of new surface water sewers through use as part of a hybrid solution provides the greatest opportunity to minimise resource use. Some further reduction in resource use is likely to be able to be achieved within construction through design optimisation, such as materials selection.
Below ground storage	Limited reduction in resource use during construction and operation may be able to be achieved through design optimisation, such as materials and plant selection. Further catchment specific assessments are required to identify the most appropriate siting, design, and construction methods for below ground storage. Cost and programme allowance should include for this, including issues such as ecology and heritage. 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 or in proximity to certain ecological designations where, as a minimum, HRA screening will be required. Given storage will typically be an end-of-pipe solution, the new infrastructure will typically 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. Siting of storage should also consider efficient use of land (such as optimising reuse of previously developed land). Given the sterilisation of land from further development, development policies and context (as established through Local Development Plans) should also be considered. Opportunities should be sought to provide wider benefits for the land during post construction reinstatement, in keeping with the landscape/townscape/seascape setting. This may include habitats, recreational access, and/or amenity value. Given the scale at which this option is being taken forward, consideration should be given to capturing these issues through design codes, or similar.
WwTW Treatment side stream	The nature and extent of WwTW upgrades is currently unknown and as such measures to prevent, reduce, mitigate and compensate effects can only be considered at the strategic level at this stage. Consideration should be given to: • The nature of the site and any sensitive receptors (e.g., terrestrial and aquatic biodiversity, heritage, archaeology, landscape, local land uses sensitive to odour and noise) and the local published information for these topics (e.g., Landscape Character Assessments, Biodiversity Action Plans, Local Development Plans)

[2] Given the proposed short sections of new sewers, EIA screening is considered to be unlikely to be required.

	• Effluent discharge requirements • Changes to the fluvial flood risk as a result of increased discharges • Seeking opportunities to reduce resource use during construction, increase efficiency in operation, increase effectiveness of treatment

NTS 2.0 Adaptive Planning

As set out in NWG PR24 and Beyond Long Term Delivery Strategy, adaptive planning is adopted for the long-term delivery strategy. The future is inherently uncertain, and it is important that the strategy is flexible enough to cope with changes in circumstances so it is robust over time.

The DWMP adaptive planning strategy sets out how the vision and ambition will be delivered and explain the governance procedures that have been established to oversee delivery.

The adaptive planning approach enables strategies to be developed in the context of different future scenarios. It aims to optimise the profile of key interventions across time, ensuring that decisions are not avoided when they are needed – for example, to ensure resilience against high-impact scenarios – while minimising the risk of stranded assets should low impact scenarios come to pass.

Adaptive planning can therefore establish what investments are needed now, and where decision points can be scheduled later in the timeline, when there is likely to be greater certainty about what is needed. It can also consider where to bring forward investment and where to invest to create flexibility.

The major focus of adaptive planning is on the timing of large new enhancement investments. Nevertheless, the following wider interventions will be considered:

- behaviour change, for example to reduce water use;
- partnership working, for example around catchment management, and collaboration with other water companies where appropriate, for example to develop new innovations and solutions;
- learning, for example from the Ofwat innovation fund projects and from overseas and other sectors;
- testing through local and production scale pilots; and
- interventions at systems level as well as at the individual infrastructure level.

Adaptive planning offers the potential to increase the uptake of the more sustainable options within the hierarchy, thus reducing adverse impacts and increasing the potential for wider benefits.

NTS 2.1 Project Stage Assessment and Controls During Implementation

NWG is currently developing a project environmental planning process for all stages of projects, which is to provide a comprehensive and systematic way to manage the

environment impact arising from different stages of the project from outline design, through to construction.

This will include detailed site specific environmental screening when implementing the preferred plan at the project level, including identification of local constraints and opportunities, any permitting/consents and consultations with stakeholders required. The findings from the environmental screening will inform their in-house conservation team, which will help to oversee the environmental issues, ensure implementation of measures to protect / conserve the environment.

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

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