United Utilities Water

Drainage and Wastewater Management Plan Strategic Environment Assessment

Post Adoption Statement

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1. Introduction

1.1 United Utilities Water's Drainage and Wastewater Management Plan

1.1.1 United Utilities Water (UUW) provides drainage and wastewater services to over 3 million homes and 200,000 businesses in the North West of England.

1.1.2 It owns and is responsible for the management of 77,000 of sewers and 567 wastewater treatment works[1] collecting wastewater before it is cleaned and safely returned to the environment.

1.1.3 It is essential that this drainage system can continue to operate effectively day to day as well as being able to cope with future pressures such as climate change, increased urbanisation and population growth which will all place increased demands on the system's capacity and treatment processes.

1.1.4 The Drainage and Wastewater Management Plan (DWMP) sets out how UUW intends to extend, improve and maintain a robust and resilient drainage and wastewater system. It takes a long-term view, setting out a planning period that is appropriate to the risks faced by UUW, covering at least 25 years. Collectively the plan contains measures to achieve the planning objectives illustrated in **Figure 1.1**.

Figure 1.1 United Utilities Water Planning Objectives

1.1.5 The DWMP operates at the following spatial levels:

- **Level 1 (L1): Company** - Over-arching companywide plan which sets out key company objectives, risks faced and summarises investment needed.

[1] United Utilities (2021) *Our Water Cycle.* Available online at: https://www.unitedutilities.com/corporate/about-us/what-we-do/water-cycle/ [Accessed August 2021].

- **Level 2 (L2): Strategic Planning Area** - Catchment plans co-created with stakeholders through strategic planning groups at a River Basin level. There are 14 Strategic Planning Areas across the UUW area. These are illustrated in **Figure 1.2**.
- **Level 3 (L3): Tactical Planning Unit (TPU)** - Drainage area plans which assess how future changes will affect catchment performance and steps that need to be put in place to manage. UUW has identified 567 TPUs.

Figure 1.2 United Utilities Water 14 Strategic Planning Areas

1.1.6 To address the identified challenges and risks, a range of management areas and interventions have been considered for inclusion in the DWMP which include *inter alia*:

- Combined and Foul Sewer Systems;
- Customer Side Management;
- Indirect measures Influencing policy;
- Sludge;
- Wastewater Treatment;
- Surface Water Management.

1.1.7 Detailed modelling and optioneering were undertaken with intervention 'blends' selected and the preferred programme identified for inclusion in the DWMP. These provide the best value solutions to address the identified risks in the TPUs and contribute towards meeting the relevant planning objectives.

Preparation of the Drainage and Wastewater Management Plan

1.1.8 Water and sewerage companies (WaSCs) have been asked to produce DWMPs for the first time, following the guidance of the Water UK DWMP Framework (the Framework)[2]. This Framework has been developed in collaboration with other regulating bodies that serve to protect communities and the environment. Consistent with the Framework, UUW has completing the following stages during the development of the DWMP:

- Strategic Context;
- Risk Based Catchment Screening (RBCS);
- Baseline Risk and Vulnerability Assessment (BRAVA);
- Options Development and Appraisal;
- Programme Appraisal; and
- Final DWMP Programme.

1.1.9 This work has led to the following:

- The publication of a Draft DWMP for public consultation and publication of a Statement of Response[3] describing the consultation on the Draft DWMP and how the company took into account the comments received in the preparation of the Final DWMP; and
- The publication of a Final DWMP.

1.1.10 The Draft DWMP was published for public consultation for 12 weeks from 30th June to 22nd September 2022. UUW received over 50 responses from regulators, stakeholders, and customers in addition to feedback from three interactive stakeholder workshops.

Strategic Environmental Assessment and the Drainage and Wastewater Management Plan

1.1.11 DWMPs are not currently a statutory requirement, and as such, they do not fall within the scope of Strategic Environmental Assessment (SEA) regulations.[4] However, completing such assessment is best practice, informs option assessments and is recommended in the Framework. The SEA process identifies, describes and evaluates potential effects; proposing where appropriate, mitigation and/or enhancement measures.

1.1.12 Consultation on the scope of the SEA was undertaken by UUW when the Scoping Report[5] for the SEA of the Draft DWMP was issued to the SEA consultation bodies in November 2021 for a consultation period of five weeks. Consultation responses were used to refine the proposed scope and approach to the SEA.

1.1.13 The Draft DWMP was then subject to SEA. This assessed the likely significant effects on the environment of the Draft DWMP including an assessment of all high-level interventions, generic intervention, the preferred programme of interventions and

[2] Water UK in collaboration with Defra, Welsh Government, Ofwat, Environment Agency, Natural Resources Wales, Consumer Council for Water, ADEPT and Blueprint for Water (2019) *A framework for the production of Drainage and Wastewater Management Plans*

[3] Available via: https://www.unitedutilities.com/globalassets/z_corporate-site/about-us-pdfs/dwmp-draft-pdfs/dwmp-statement-of-response.acc23.pdf [Accessed February 2023]

[4] *Statutory Instrument 2004 No. 1633 – The Environmental Assessment of Plans and Programmes Regulations 2004.* In Wales, this was transposed into legislation on 12th July 2004 as Statutory Instrument 2004 No.1656 - *The Environmental Assessment of Plans and Programmes (Wales) Regulations 2004*. The regulations translated EU law into UK regulations. EU law has ceased to apply in the UK under the terms of the Withdrawal Agreement and EU Treaties. The European Union (Withdrawal) Act 2018 (EUWA) has established a new body of domestic law known as retained EU law.

[5] Wood (2021) Drainage and Wastewater Management Plan Strategic Environmental Assessment Scoping Report (November 2021)

alternatives. The findings of the assessments were presented in the Environmental Report[6] that was published for consultation alongside the Draft DWMP in June 2022.

1.2 Purpose of the Post Adoption Statement

1.2.1 Regulation 16 (4) of the SEA Regulations require that when a plan or programme is adopted (in this case, the DWMP), the consultation bodies and the public consulted on the Environmental Report are informed and the following specific information is made available:

- the plan as adopted;
- a statement summarising:
  - how environmental considerations have been integrated into the DWMP;
  - how the Environmental Report has been taken into account;
  - how opinions expressed in response to the consultation on the Draft DWMP and the Environmental Report have been taken into account;
  - the reasons for choosing the DWMP, as adopted, in the light of the other reasonable alternatives dealt with; and
  - the measures that are to be taken to monitor the significant environmental effects of the implementation of the DWMP.

1.2.2 The purpose of this Post Adoption Statement is to provide the specific information outlined under each of the points listed above and which is presented in the following sections of this statement.

[6] Wood (2022) Drainage and Wastewater Management Plan Strategic Environmental Assessment Environmental Report (June 2022)

2. How environmental considerations have been integrated into the DWMP

2.1 Environmental considerations in the DWMP

2.1.1 The subsections that follow set out how environmental considerations have been taken into account by UUW during the following key stages of the development of the DWMP:

- Demand forecasting;
- Risk Based Catchment Screening;
- Baseline Risk and Vulnerability Assessment;
- Options identification, appraisal and selection; and
- Consultation and engagement.

Demand forecasting

2.1.2 UUW has completed a demand forecast for future water resource requirements, to inform an understanding of the implications for future wastewater generation and capacity of the sewer and wastewater treatment system. UUW demand forecasts within the DWMP are based on industry-standard methodologies taking into account projected development and population growth, economic factors and climate change, as well as behavioural changes (such as post-pandemic patterns of water use). The demand forecast is in line with flow assumptions and models used for the Water Resources Management Plan (WRMP). The demand forecast shows that during the period to 2050, water use is projected to increase with an increase in dry weather flow (DWF) of 15.9%. The projected increase takes into account demand reduction assumptions associated with options applied in UUW's WRMP.

2.1.3 Between 2020 and 2030, if no mitigation is undertaken, UUW anticipate an additional flood volume of 1.4million m3 in a 1 in 20-year storm (approximately a 38% increase in wastewater flood volume). This figure reflects the amount of additional inputs to the sewer system as a result of the combined effects of climate change, population growth and urban creep. A significant proportion of the additional forecast volume consists of rainwater draining into the sewer network.

2.1.4 Demand forecasting fed into the Risk Based Catchment Screening (RBCS) and Baseline Risk and Vulnerability Assessment (BRAVA).

Risk Based Catchment Screening

2.1.5 UUW utilised Risk Based Catchment Screening (RBCS) to understand risk across the UUW area. This process was used to prioritise the Tactical Planning Units (TPUs) which required further investigation. This process included an assessment at the catchment level taking account a range of factors including environmental considerations related to discharges upon bathing or shellfish waters, discharges to sensitive receiving waters,

pollution incidents, wastewater treatment works quality compliance. This also included taking into account the Water Industry National Environment Programme (WINEP)[7].

Baseline Risk and Vulnerability Assessment

2.1.6 Baseline Risk and Vulnerability Assessment (BRAVA) allowed UUW to model baseline and future performance, taking into account factors such as climate change and population growth, to understand where there is likely to be a deficit in achieving the long-term planning objectives if no action is taken. Bespoke BRAVA assessments were undertaken of all TPUs. These were informed by environmental considerations such as assessment of wastewater quality compliance and pollution risk. The full range of factors considered in the BRAVA assessments were:

- Population growth;
- Urban creep (the expansion of non-permeable surfaces;
- Infiltration (surface water and ground water entering the sewer);
- Per capita consumption (water usage per person);
- Climate change;
- Discharges (both intermittent and continuous); and
- Maintenance.

2.1.7 Through the BRAVA process UUW were able to identify locations where interventions may be required in order to ensure planning objectives can be achieved.

Options identification, appraisal and selection

2.1.8 Following the completion of the RBSC and BRAVA process, UUW identified 372 drainage areas where drainage, flooding, pollution and treatment risks were identified. A limited number of these drainage areas were characterised as being either complex or strategic:

- Complex drainage areas reflect the outcome of the problem characterisation which has identified multiple issues and the need for adaptive planning to mitigate risks; and
- Strategic drainage areas are those where significant future population growth and development has been planned which will result in significant and complex additional investment needs.

2.1.9 Options were developed to address the risks identified at the TPU level to deliver one or more of the planning objectives. The options development process transitioned from an ‘unconstrained’ to a ‘constrained’ and finally a ‘feasible’ list of options. Detailed modelling and optioneering works was undertaken to determine the most appropriate, effective response with option ‘blends’ selected to provide the best value solutions to address the identified risks and contribute towards meeting the relevant planning objectives.

2.1.10 The preferred programme of options was selected following a rigorous process of options identification and appraisal, environmental assessment and stakeholder engagement, including consultation on the Draft DWMP.

2.1.11 Environmental assessments, including a SEA, Habitats Regulations Assessment (HRA) and Water Framework Directive (WFD) Assessment were carried out on the preferred

[7] The WINEP is the programme of actions water companies need to take to meet statutory environmental obligations, non-statutory environmental requirements or delivery against a water company’s statutory functions.

plan, to ensure no environmental considerations taken into account and measures identified to minimise or mitigate environmental harm. Environmental metrics were also incorporated into UUW's screening processes.

Consultation and engagement

2.1.12 UUW has undertaken extensive stakeholder and customer engagement during the preparation of the DWMP. This has included ongoing engagement with the statutory SEA consultation bodies.

2.2 Environmental considerations in the Strategic Environmental Assessment

2.2.1 To provide the context for the SEA, and in compliance with the SEA Regulations, the relevant aspects of the current state of the environment and its evolution without the DWMP were considered at the outset of the SEA process, along with the environmental characteristics likely to be significantly affected by the plan. This information was contained in the SEA Scoping Report and subsequently updated as part of the Environmental Report.

2.2.2 The key environmental, social and economic issues identified in UUW's operational area and subsequently reflected in the assessment of DWMP options are summarised in **Table 2.1**.

Table 2.1 Key economic, social and environmental issues relevant to the DWMP

Topic Area	Key Environmental, Social and Economic Issues Relevant to the DWMP
Biodiversity, Flora and Fauna	• The need to protect, restore and enhance biodiversity, ecological functions and biodiversity connectivity within UUW's operational area, particularly protected sites designated for nature conservation. • The need to continue to increase and improve the condition of priority habitats and habitats of priority species, and restore populations of these species and other specially protected species. • The need to avoid activities likely to cause irreversible damage to natural heritage. • The need to take opportunities to improve connectivity between fragmented habitats to create functioning habitat corridors. • The need to recognise the importance of ensuring biodiversity is resilient to the effects of climate change, including allowing adaptation. • The need to engage more people in biodiversity issues so that they personally value biodiversity and know what they can do to help, including through recognising the value of the ecosystem services.
Geology Land Use and Soils	• The need to sustainably manage and/or improve the quality of agricultural land in the region. • The need to protect and enhance geological features of importance (including geological SSSIs) and maintain and enhance soil function and health. • The need to protect, maintain and enhance geomorphological functions and services. • The need to manage the land more holistically at the catchment level, benefitting landowners, other stakeholders, the environment and sustainability of natural resources (including water resources). • The need to protect peatlands in the North West.

Topic Area	Key Environmental, Social and Economic Issues Relevant to the DWMP
	• The need to make use of previously developed land (PDL), and to reduce the prevalence of derelict land. • The need to maintain soil function.
Water	• The need to maintain and further improve the quality of the region's river, estuarine and coastal waters and in particular the biological quality of rivers, taking into account WFD/RBMP objectives. • The need to maintain and further improve the quantity and quality of groundwater resources taking into account WFD/RBMP objectives. • The need to ensure the continued risk of flooding is mitigated effectively. • The need to improve the resilience, flexibility and sustainability of water resources in the region, particularly in light of potential climate change impacts on surface water and groundwaters. • The need to ensure sustainable abstraction to protect the water environment. • The need to ensure that people understand the value of water.
Air Quality	• The need to minimise emissions of pollutant gases and particulates and enhance air quality. • The need to reduce the need to travel and promote sustainable modes of transport.
Climatic Factors	• The need to reduce the need to travel and promote sustainable modes of transport. • The need to reduce greenhouse gas emissions arising from implementation of the DWMP. • The need to take into account, and where possible adapt to, the potential effects of climate change. • The need to increase environmental resilience to the effects of climate change.
Population and Human Health	• The need to ensure drainage and wastewater services remain affordable, especially for deprived or vulnerable communities. • The need to ensure water quantity and quality is maintained for a range of uses including tourism, recreation, navigation and other use such as agriculture. • The need to ensure a balance between the built and natural environment that will help to provide opportunities for local residents and tourists for access to green infrastructure and the natural and historic environment, as well as protecting and enhancing recreational resources. • The need to ensure that the DWMP measures do not adversely affect the health and well-being of any member of the community. • The need to ensure that the DWMP measures do not have an adverse economic impact and that benefits are maximised. • The need to ensure that sites of nature conservation importance, heritage assets, water resources, important landscapes and public rights of way contribute to recreation and tourism opportunities and subsequently health and wellbeing and the economy.
Material Assets and Resource Use	• The need to promote water efficiency. • The need to maintain the balance between capacity, use and constraints for water. • The need to reduce energy consumption. • The need to ensure the sustainable and efficient use of resources such as construction materials.

Topic Area	Key Environmental, Social and Economic Issues Relevant to the DWMP
	• The need to minimise waste arisings, promote reuse, recovery and recycling and minimise the impact of wastes on the environment and communities.
Cultural Heritage	• The need to conserve and enhance the historic significance of buildings, monuments, features, sites, places, areas and landscapes of archaeological and cultural heritage interest, and their settings. • The need to avoid damage to important wetland areas with potential for palaeoenvironmental deposits.
Landscape	• The need to protect and improve the natural beauty of the region's national parks, coastline, other areas of natural beauty, including undesignated landscapes and encourage the growth of woodland and forest in the region. • The need to conserve and enhance the landscape distinctiveness of the area. • The need to minimise any adverse impacts upon landscape that may result from measures in the DWMP.

2.2.3 The issues listed above were reflected in the objectives and guide questions that collectively comprised the framework used to assess the DWMP (see **Table 2.2**).

Table 2.2 Assessment Framework

Topic	Objective	Guide Questions
Biodiversity, Flora and Fauna	1. To protect, restore and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species, enhanced ecosystem resilience, habitat connectivity and creation and contribute to the sustainable management of natural habitats and ecosystems.	• Will it protect, restore and enhance where possible, the most important sites for nature conservation (e.g., internationally or nationally designated conservation sites such as SACs, SPAs, Ramsar and SSSIs)? • Will it protect, restore and enhance non-designated sites and local biodiversity? • Will it alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems? • Will it provide opportunities for new terrestrial and aquatic habitat creation or restoration and/or link existing habitats as part of the development process? • Will it protect, and enhance where appropriate, coastal and marine habitats and species? • Will it maintain and enhance the green infrastructure network and the biodiversity it supports? • Will it maintain and enhance ecosystem resilience? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e., within their limits and capacities taking into account climate change adaptability? • Will it promote climate change resilience of both designated and non-designated sites?
Soils, Land Use and Geology	2. To protect and enhance soil quantity, quality and functionality	• Will additional land be required for the development or implementation of the intervention or will it require below ground works leading to land sterilisation?

Topic	Objective	Guide Questions
	and geodiversity and ensure the appropriate and efficient use of land.	• Will it avoid damage to, protect and enhance where possible protected sites designated for their geological interest (GCR sites, SSSI and RIGS) and features of wider geodiversity interest? • Will it minimise the loss of best and most versatile agricultural land? • Will it avoid adverse effects on other land uses? • Will it minimise land contamination? • Will it ensure efficient use of land (e.g., make use of previously developed land)?
Water – Quantity and Quality	3. To protect and enhance the quality and quantity of surface and groundwater resources.	<u>Quantity</u> • Will it minimise the customer demand for water resources? • Will it result in changes to river flows, channel morphologies, wetted width or river levels? • Will it support the achievement of relevant environmental objectives set out in River Basin Management Plans? • Will it alter the sediment transport regime of the surface waters? <u>Quality</u> • Will it prevent pollution and protect and improve surface, groundwater, estuarine and coastal water quality? • Will it prevent the deterioration of Water Framework Directive (WFD) waterbody status (or potential)? • Will it support the achievement of WFD protected area objectives? • Will it ensure a new activity or new physical modification does not prevent the future achievement of good status for a water body? • Will it support the achievement of relevant environmental objectives set out in River Basin Management Plans? • Will the option prevent nutrient loading in water bodies?
Water – Flood Risk	4. To reduce or manage flood risk.	• Will it be at risk of flooding now or in the future? • Will it have the potential to help alleviate or mitigate flooding in the catchment area including to people and property now or in the future? E.g., will it avoid reducing flood plain storage, or provide opportunities to improve flood risk management? • Will it promote the use of sustainable drainage systems? • Will it promote opportunities for collaborative working with other risk management authorities?
Air	5. To minimise emissions of pollutant gases and particulates and enhance air quality.	• Will it reduce or minimise pollutant emissions to air? • Will it maintain or enhance ambient air quality, keeping pollution below Local Air Quality Management thresholds (e.g., in Air Quality Management Areas or sensitive habitats)?

Topic	Objective	Guide Questions
Climatic Factors	6. To reduce greenhouse gas emissions.	• Will it reduce or minimise greenhouse gas emissions? • Will it have a low level of embodied carbon? • Will it provide new infrastructure that is energy efficient and/or minimises the use of energy? • Will it provide new infrastructure that could contribute or make use of renewable energy sources? • Will the option affect carbon sequestration?
	7. To adapt and improve resilience to the threats of climate change.	• Will it improve resilience and/or adaptability to the likely effects of climate change, e.g., by increasing resilience of water supplies or catchments? • Will it increase environmental resilience to the effects of climate change including to impacts on flood risk and water quality?
Population	8. To promote a sustainable economy and maintain and enhance the economic and social well-being of local communities.	• Will it ensure that sufficient wastewater treatment capacity is in place to support predicted increases in population (including any seasonal changes)? • Will it help to meet the employment needs of local people? • Will it contribute to sustaining and growing the local and regional economy? • Will it avoid disruption through effects on the transport network? • Will it avoid negative effects on built assets/ existing infrastructure including transport?
Human Health	9. To protect and enhance human health and well-being.	• Will it maintain surface water and bathing water quality within statutory standards? • Will it help to promote healthy communities and avoid risks to health and wellbeing (for example, due to noise resulting from construction traffic or disruption to safe and reliable water/sewerage services)? • Will it improve opportunities for social interaction and community cohesion? • Will it protect and enhance public access to, and enjoyment of, green and blue infrastructure, open space/recreational facilities and the natural and historic environment, and in doing so help promote healthy lifestyles including mental well-being?
Material Assets - Water Resources	10. To promote and enhance the sustainable and efficient use of resilient water resources.	• Will it improve efficiency in water consumption? • Will it increase the resilience of water resources, now and into the future? • Will it contribute towards improving the awareness of water sustainability?
Material Assets – Waste and Resource Use	11. To minimise waste, promote resource efficiency and move towards a circular economy.	• Will it make use of existing infrastructure? • Will it promote the re-use and recycling of waste materials and reduce the proportion of waste sent to landfill?

Topic	Objective	Guide Questions
		• Will it help to encourage sustainable design or use of sustainable materials (e.g., supplied from local resources)?
Cultural Heritage	12. To conserve and enhance the historic environment including the significance of heritage assets and their settings and archaeological important sites.	• Will it avoid damage to, conserve or enhance the historic environment, including heritage assets and their settings such as historic buildings, conservation areas, features, places and spaces, that enhance local distinctiveness? • Will it avoid or minimise damage to archaeologically important sites? • Will it avoid damage to important wetland areas with potential for paleoenvironmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?
Landscape	13. To conserve, protect and enhance landscape and townscape character and visual amenity.	• Will it avoid adverse effects to, and enhance where possible, protected/designated landscapes and the settings of designated landscapes (including woodlands) such as National Parks or AONBs? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g., woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it protect and enhance landscape character, townscape, seascape and green infrastructure? • Will it minimise adverse visual impacts?

2.2.4 The effects of the DWMP were assessed in a staged process as set out below.

High-level interventions

2.2.5 High-level interventions categorised by management areas, to address planning objective per drainage area were considered with environmental constraints identified, assessed and implications for mitigation identified, drawing where appropriate from other assessments (such as the draft WRMP24 where interventions are common between plans, e.g., behavioural change).

2.2.6 The environmental constraints of high-level interventions were identified through a GIS led process for a range of environmental topics including (inter alia) biodiversity, flora and fauna soils land use and geology, air, cultural heritage and landscape, where data is available for each catchment. Where the relevant constraint could have a material effect on the generic intervention, proposed mitigation measures were considered.

2.2.7 Such considerations were then reflected in high-level costings for the interventions by UUW. The outputs of this process were used within the optioneering work undertaken to inform the selection of the preferred 'blends' of interventions.

Generic interventions

2.2.8 The assessment provided an indication of the effects arising from the broad option types proposed. The assessment covered 34 option types across six management areas:

- Combined and Foul Sewer Systems (9 options);

- Customer Side Management (7 options);
- Indirect Measures (3 options);
- Sludge (4 options);
- Surface Water Management (3 options);
- Wastewater Treatment (8 options).

2.2.9 The options assessed are set out in **Table 2.3**.

Table 2.3 DWMP Generic Options

Management Area	Option Ref	DWMP Generic Option
Combined and Foul Sewer Systems	N1	Intelligent network operation
	N2	Increase the capacity of existing foul / combined networks
	N4	Intelligent asset maintenance
	N5	Sewer rehab
	N6	Property Level Resilience (PLR)
	N7	Enhanced operational maintenance
	N8	Attenuation
	N9	Sewer maintenance
	N10	Cross boundary transfer
Customer Side Management	CM1	Water efficient appliances
	CM2	Water efficiency measures
	CM3	Rainwater harvesting
	CM4	Customer incentives
	CM5	Domestic and business customer education
	CM6	Greywater treatment and reuse
	CM7	Charging and bill incentives
Indirect measures	IM1	Influencing policy
	IM2	Investigate and monitor
	IM3	Future technology
Sludge	B1	Resource recovery
	B2	Sludge centre rationalisation

Management Area	Option Ref	DWMP Generic Option
	B3	Sludge centre decentralisation
	B4	Increase treatment capacity
Surface Water Management	SW1	Surface water source control measures
	SW2	Surface water pathway interception measures
	SW3	Attenuation
Wastewater treatment	W1	Treat or pre-treat wastewater in the network
	W2	Increase treatment capacity
	W3	Intelligent treatment works operation
	W4	Treatment works rationalisation
	W5	Treatment works de-centralisation
	W6	Modification of consent / permits
	W7	Catchment management initiatives
	W8	Effluent reuse

2.2.10 The assessment identified the neutral, minor, moderate and significant positive and negative effects for construction and operation of each option against the 13 SEA assessment objectives. Additionally, the assessments provided a core assessment that was then updated for location and scheme specific information for those options screened in for further assessment.

2.2.11 The completion of these assessments also demonstrated that the alternative options (to the preferred programme of interventions) were considered and assessed with likely effects evaluated.

Preferred programme of interventions

2.2.12 The detailed modelling and optioneering works identified the preferred ‘blends’ (or programme) of interventions for each TPU drainage area. These interventions provided the best value solutions to address the identified risks and contribute towards meeting the relevant planning objectives. per identified drainage area, combining generic and location specific options with a particular focus on the complex and strategic locations. This has ensured that the effects of the draft Plan have been identified, described and evaluated.

2.2.13 UUW identified 407 options for the 26 strategic or complex TPU catchments. There were four TPUs which were not assessed in the SEA Environment Report and the assessment of these is set out in **Appendix C**. For each of the strategic and complex TPU catchments that have been assessed, a legal obligation to ‘increase treatment capacity’ option has been identified; each of these options was screened in for assessment. For the SEA, an additional screening was undertaken for the remaining options using the option information available. Based on the scale of their estimated embodied and operational carbon emissions and CAPEX, in line with the SEA assessment thresholds for significance, an additional 11 options across 7 of the strategic or complex TPU

catchments were screened in, all of which are surface water source control measure options, which have also been assessed. Each of these options include significant embodied carbon whilst three also include significant operational carbon.

Table 2.4 Options Screened in for Assessment

TPU Catchment	Number of options screened in for assessment
Alsager	Increase treatment capacity - 1
Altrincham	Increase treatment capacity - 1
Blackburn	Increase treatment capacity - 1 Surface water source control measures -1
Bromborough	Increase treatment capacity - 1
Burscough	Increase treatment capacity - 1
Carlisle	Increase treatment capacity - 1
Carnforth	Increase treatment capacity - 1
Davyhulme	Increase treatment capacity - 1 Surface water source control measures -1
Ellesmere Port	Increase treatment capacity - 1
Fleetwood	Increase treatment capacity - 1 Surface water source control measures -1
Hillhouse	Increase treatment capacity - 1
Kendal	Increase treatment capacity - 1
Knutsford	Increase treatment capacity - 1
Lancaster	Increase treatment capacity - 1
Macclesfield	Increase treatment capacity - 1
Partington	Increase treatment capacity - 1
Penrith	Increase treatment capacity - 1 Surface water source control measures -1
Preston	Increase treatment capacity – 1 Surface water source control measures - 3
Sale	Increase treatment capacity - 1
Salford	Increase treatment capacity - 1
Stretford	Increase treatment capacity - 1
Urmston	Increase treatment capacity - 1
Whitehaven	Increase treatment capacity - 1 Surface water source control measures -2

TPU Catchment	Number of options screened in for assessment
Wilmslow*	Increase treatment capacity - 1
Wigan	Increase treatment capacity - 1 Surface water source control measures -2
Workington	Increase treatment capacity - 1
Total	37

*assessed in Appendix C of this PAS

2.2.14 The construction and operational effects of those screened in options of each preferred programme of interventions were assessed against all of the SEA objectives that comprise the assessment framework. The assessment of effects included consideration of the following:

- the nature of the potential effect (what is expected to happen);
- the timing and duration of the potential effect (e.g., short, medium or long term);
- the geographic scale of the potential effect (e.g., local, regional, national);
- the location of the potential effect (e.g., whether it affects rural or urban communities, or those in particular parts of a water company area); and
- the potential effect on vulnerable communities or sensitive sites.

2.2.15 Any mitigation measures with the potential to avoid, minimise, reduce, mitigate or compensate for the identified effect(s) with evidence (where available) was included in supporting commentary.

Alternative Plan assessments

2.2.16 An important part of the SEA process is the assessment of reasonable alternatives. The assessment of all reasonable alternative generic option types ensured that consideration was given to all potential interventions.

3. How the findings of the Environmental Report have been taken into account

3.1 Overview

3.1.1 The SEA Environmental Report and DWMP have been developed in tandem. **Table 3.1** details key stages of the SEA and its relationship with the development of the DWMP.

Table 3.1 Key stages in the development of the Environmental Report and its relationship with the DWMP

Strategic Environmental Assessment	DWMP	Relationship
Scoping		
The scoping stage of the SEA identified other relevant plans, programmes and environmental protection objectives which could be affected by, or which could affect, the DWMP. **The scoping stage also characterised the relevant aspects of the current state of the environment and its evolution without the DWMP.**	The DWMP used the plans and programmes identified to ensure that it was fully in compliance with local, national and international policy and legislation. Baseline information supported early optioneering.	The links between the other relevant plans, programmes, policies and strategies that were applicable to the DWMP and its Environmental Report were outlined. These included plans and programmes at an international, European or national level covering a variety of topics. Information on environmental issues helped determine constraints on the suitability of certain options. The SEA objectives ensured that the full range of social, economic and environmental issues was considered in the DWMP's development.
Assessment		
Testing the plan or programme objectives against the SEA objectives	The Environment Report and the DWMP were developed together.	The Environmental Report and option appraisals were jointly used to derive the DWMP.
	The DWMP considered unconstrained options and high-level interventions.	Screening of the high-level interventions helped to refine those taken forward in the DWMP.
The SEA assessed 34 generic option interventions including consideration of construction and operational effects	The range of generic interventions were considered for implementation in the DWMP. The option development process	The generic options were subject to a range of assessments including SEA as well as assessment of environmental and

Strategic Environmental Assessment	DWMP	Relationship
	mirrors the WRMP process, with unconstrained, feasible and preferred options being developed and subject to appraisal. The planning objectives per drainage area have been considered with environmental constraints identified, assessed and implications for mitigation identified, drawing where appropriate from other assessments	social costs and benefits. The findings of the SEA helped to identify the preferred programme of interventions.
The SEA assessed the preferred programme of interventions for each TPU using the generic option assessments and locational specific impacts	The preferred programme of interventions was identified to help address the identified risks (utilising the generic interventions previously assessed).	The preferred programme of interventions was subject to a range of assessments including SEA, HRA and WFD as well as assessment of broader environmental and social costs and benefits.
The SEA included an assessment of plan alternatives comprised of any other programmes of intervention for each drainage area (incorporated through assessment of the 34 generic option types)	Consultation was undertaken on the DWMP to incorporate the opinions of stakeholders and customers on economic, customer and financial aspects of the DWMP.	The consideration of plan alternatives within the SEA helped to identify the preferred programme of interventions in the DWMP.
Reporting		
The key findings of the Environmental Report are presented along with UUW's response in **Table 3.2** below. The extent to which the findings have informed the final DWMP is detailed in **Section 5** of this Post Adoption Statement.		
Consultation		
Responses to consultation on the Environmental Report are presented along with the UUW's responses in **Section 4** and **Appendix B**. The extent to which the consultation has informed the final DWMP is detailed in **Section 5** of this Post Adoption Statement.		
Monitoring		
Proposals for monitoring identified in **Section 6** of this Post Adoption Statement will be implemented by UUW.		

3.2 Key findings of the SEA

3.2.1 As demonstrated in **Table 3.1** above, the SEA process has played an important role in the development of the DWMP. The key findings of the Environmental Report are summarised in **Table 3.2** together with UUW's response.

Table 3.2 Key findings of the Environmental Report

No	Key Environmental Report Findings	Response
1	None of the options within the TPU catchments have been identified as having effects on the features recognised within designated sites of nature conservation. The TPU schemes seek to increase treatment capacity at wastewater treatment works or address surface water control measures. Given increase in discharge volumes associated with the operation of the options is assumed to be consented (in terms of volumes and concentrations of pollutants) the impact on biodiversity (SEA Objective 1) is largely assumed to be neutral for the preferred scheme options in operation although there is potential for some localised positive effects on water dependent designated conservation sites (if present) and biodiversity through improvements to water quality. Some negative effects are identified for construction.	The results of the findings are noted. Mitigation for locational specific effects on biodiversity will be considered during the planning phases of each of the individual schemes. Best practice procedures will be followed for all construction works and opportunities will be sought to go above and beyond standards set down in guidance. These issues would also be considered further at the project stage as part of the EIA process (as required).
2	Many of the works required as part of the preferred programme will take place within urban areas or within existing WwTW which is compatible with the preservation of soil quality and land use (SEA Objective 2). Where greenfield options are identified they are largely within urban fringe areas with poor soil quality. The implementation of 'green' solutions such as SUDs is likely to provide positive impacts in the operational phase for many TPU options.	The results of the findings are noted.
3	Many of the options for combined and foul sewer works, wastewater treatment, and customer side management have associated potential for improvement on the quality of receiving water during operation thereby supporting achievement of SEA Objective 3 during operation. Any increase in discharge volumes associated with the operation of TPU options to increase treatment capacity at wastewater treatment works is assumed to be consented (in terms of volumes and concentrations of pollutants) and as such it is assumed there would be no effect on water quality cumulatively. However, due to the lack of information on discharge volumes, there remains some uncertainty.	The results of the findings are noted. Uncertainty around this will be addressed during subsequent investigations under cycle 2 of the DWMP.
4	A number of TPU WwTW options are located partially or fully within Flood Zone 3	The results of the findings are noted.

No	Key Environmental Report Findings	Response
	although would not cumulatively add to flood risk elsewhere. Other measures such as surface water management would mean that positive effects are therefore likely for flood risk (SEA Objective 4) overall as a result of the preferred programme.	Mitigation for flood risk will be considered during the planning phases of each of the individual schemes. Best practice procedures will be followed for all construction works and opportunities will be sought to go above and beyond standards set down in guidance. These issues would also be considered further at the project stage as part of the EIA process (as required).
5	The operation of plant and machinery and vehicle movements during the construction phase would generate emissions to air which could affect air quality (SEA Objective 5). The scale of effect is largely linked to the scale of construction. Some works are within/adjacent to Air Quality Management Areas (AQMA). For some locations the scale of additional vehicle movements may be incompatible with the requirements of the AQMA.	The findings of the assessment are noted. Mitigation will be considered during the planning phases of each of the individual schemes. Best practice procedures will be followed for all construction works and opportunities will be sought to go above and beyond standards set down in guidance. Detailed air quality and transport assessments will be undertaken as part of the Environmental Impact Assessment (EIA) process (if/as required). Measures to mitigate air quality impacts arising from construction activities will be considered within a Construction and Environmental Management Plan. These measures may include, for example, dust suppression, use of lower emissions plant, and monitoring.
6	It is estimated that the embodied carbon associated with the new infrastructure is significant (SEA Objective 6), reflecting the substantial quantities of concrete and steel. However, for many of the proposed schemes, once in use, it is anticipated that the energy use (and the associated operational carbon emissions) is likely to be relatively modest, (within the context of UUW's current energy use).	The findings of the assessment are noted. Measures to reduce greenhouse gas emissions during construction will be considered including, for example, the use of low emission plant.
7	The Draft DWMP sets out how UUW intends to extend, improve and maintain a robust and resilient drainage and wastewater system over 25 years. This long term view has included taking into account flood risk resilience as part of the Risk Based Catchment Screening. Many of the scheme options seek to reduce the incidences of flooding through approaches to combined and foul sewer systems and surface water management which will cumulatively support a positive effect on addressing the threats of climate change (SEA Objective 7).	The findings of the assessment are noted.
8	The DWMP covers a 25 year period. Cumulatively if all TPU schemes are implemented this would have a very	The findings of the assessment are noted.

No	Key Environmental Report Findings	Response
	significant cumulative capex value, exceeding many times the threshold of significance for assessment of effects on the economy (SEA Objective 8). In consequence, it represents a significant investment in essential infrastructure which would, given its longevity create long term economic benefits and employment opportunities in the water and construction sectors across the North West. Direct, indirect and induced employment opportunities, given the focused areas of investment could also be beneficial to the communities in each TPU area.	To maximise benefits to the local economy, UUW will seek, where possible, to: • use local labour; and • appoint local contractors/sub-contractors and use locally sourced materials.
9	Many of the scheme options seek to reduce the incidences of flooding through approaches to combined and foul sewer systems and surface water management which will cumulatively support human health and wellbeing within the UUW area. Therefore, they are not considered to have a cumulatively negative effect on health and wellbeing (SEA Objective 9).	The findings of the assessment are noted.
10	The DWMP includes a range of measures aimed at reducing water entering the wastewater network. TPU specific schemes seek to increase surface water source control measures which are also considered to support resilient water resources. The DWMP supports achievement of resilient water resources (SEA Objective 10).	The findings of the assessment are noted.
11	Implementation of the DWMP would require raw materials (concrete and steel), fuel for vehicles and plant and generate waste which will impact on resource use which is likely to be significant cumulatively (SEA Objective 11).	The findings of the assessment are noted. Opportunities to utilise reused/recycled materials will be considered where appropriate. Construction wastes will also be reused/recycled where possible.
12	There is potential for cumulative effects on heritage assets (SEA Objective 12) where measures are located in close proximity to each other. Only one preferred TPU locational option (Carlisle) was assessed as having significant negative effects in the construction phase due to the scale of works and associated potential for works to affect the setting of a World Heritage Site and Scheduled Monument (which cross the WwTW site).	The findings of the assessment are noted. Mitigation will be considered during the planning phases of each of the individual schemes. Best practice procedures will be followed for all construction works and opportunities will be sought to go above and beyond standards set down in guidance. These issues would also be considered further at the project stage as part of the EIA process (as required).
13	There is potential for cumulative effects on landscape (SEA Objective 13) where measures are located in close proximity to	The findings of the assessment are noted. Mitigation will be considered during the planning phases of each of the individual schemes. Best

No	Key Environmental Report Findings	Response
	each other. Effects will be greater for measures requiring new infrastructure within or close to sensitive landscapes (AONB, National Parks). No TPU options are within sensitive landscapes.	practice procedures will be followed for all construction works and opportunities will be sought to go above and beyond standards set down in guidance. These issues would also be considered further at the project stage as part of the EIA process (as required).

4. How the opinions expressed in response to the consultation have been taken into account in preparing the Final Plan

4.1 Overview

4.1.1 Consultation has been an integral part of the SEA of DWMP. This has included the following main stages of consultation:

- consultation with the statutory SEA bodies on the scope of the SEA; and
- formal public consultation on the SEA Environmental Report of the Draft DWMP.

4.1.2 Consultation on the DWMP has included:

- numerous surveys, technical stakeholder groups, customer research and engagement activities throughout the process of developing the DWMP;
- an extensive early pre-consultation with regulators and stakeholders from 2018 onwards to define a framework for delivery of the first DWMP;
- working closely with the UUW's independent customer and stakeholder challenge group 'YourVoice';
- formal consultation on the Draft DWMP (alongside which the SEA Environmental Report was published); and
- publication of a Statement of Response, outlining how the comments received on the Draft DWMP have been taken into account in the development of the final DWMP.

4.1.3 A summary of the outcomes of the consultation on the SEA and Draft DWMP are provided in the sections that follow.

4.2 SEA Consultation

SEA scoping consultation

4.2.1 The first stage of the SEA was the production of a Scoping Report. This reviewed plans and programmes that could affect the DWMP or be affected by it, outlined baseline information for the plan area and set out the proposed framework for assessing potential environmental effects. The SEA Scoping Report[8] for the DWMP was issued for consultation to the statutory consultation bodies (the Environment Agency, Historic England, Natural England, Cadw, Natural Resources Wales, Welsh Government, Scottish Environment Protection Agency, NatureScot and Historic Environment Scotland) for a five-week period ending 10th December 2021.

[8] Wood (2021) Drainage and Wastewater Management Plan Strategic Environmental Assessment Scoping Report (November 2021)

4.2.2 Six responses to the consultation were received, which resulted in amendments to the baseline information and assessment framework that was used to assess the Draft DWMP (a schedule of consultation responses to the Scoping Report was contained in Appendix A of the Environmental Report for the Draft DWMP).

Public consultation on the Environmental Report

4.2.3 UUW published an Environmental Report alongside the Draft DWMP for consultation for 12 weeks from 30th June to 22nd September 2022. The Environmental Report indicated that UUW welcomed, in particular, views on whether consultees agreed:

- that the Environmental Report had correctly identified the likely significant effects of the Draft DWMP and if not, what other significant effects consultees thought had been missed, and why;
- with the conclusions of the Environmental Report and the recommendations for mitigation and enhancement of significant effects; and
- with the proposed arrangements for monitoring the significant effects of the implementation of the DWMP and if not, what measures would consultees propose.

4.2.4 Responses were received to the consultation from the Environment Agency and other organisations (a schedule of consultation responses to the Environmental Report of the Draft DWMP is set out in **Appendix B**).

4.3 Consultation on the Draft DWMP

4.3.1 UUW completed an extensive pre-consultation phase with regulators, stakeholders and customers prior to consultation on the Draft DWMP. UUW engaged the established Customer Challenge Group (CCG) known as, 'YourVoice Customer and Stakeholder panel'. UUW engaged with stakeholders and customers throughout the development of the DWMP including setting the long-term targets, identifying areas of shared risks or opportunities, and determining options for the preferred plan.

4.3.2 The Draft DWMP was issued for public consultation for 12 weeks from 30th June to 22nd September 2022. During the consultation process UUW:

- contacted 281 stakeholders directly via newsletter in addition to Ofwat, Defra, Customer Council for Water (CCW) and the EA;
- publicised the consultation on the UUW corporate website;
- held 3 workshops with over 40 organisations and 70 stakeholders;
- had ongoing 'business as usual' engagement with stakeholders and regulators within which the consultation was promoted and there were opportunities to discuss the plan.

4.3.3 In total, over 50 consultation responses were received to the DWMP online survey. The themes raised in the responses to the consultation are summarised in **Table 4.1** below. A summary of the responses received, and UUW's replies is available in Section 3 of the Statement of Response[9] document. The Statement of Response to the consultation describes how the responses to the consultation were taken into account was published and made available through UUW's website in December 2022.

[9] Available via: https://www.unitedutilities.com/globalassets/z_corporate-site/about-us-pdfs/dwmp-draft-pdfs/dwmp-statement-of-response.acc23.pdf [Accessed March 2023]

Table 4.1 Summary of Draft DWMP consultation feedback

Key themes arising from consultation	Summary of feedback received
Options development, programme optimisation and the preferred plan	• A range of positive feedback regarding approach; • Importance of an adaptive plan that prioritises low carbon and green solutions acknowledged; • Support for options hierarchy and prioritisation of nature based solutions; • Areas of improvement required relating to: options development and programme optimisation; The preferred plan; Adaptive planning; and WINEP and legal obligations.
Stakeholder engagement and partnership solutions	• The majority of feedback on this theme was from regulators and stakeholders, and recognised the collective efforts made in developing the draft DWMP; • Participants also raised some areas for improvement in relation to: partnership solutions; stakeholder engagement; Strategic Planning Area DWMPs; and alignment with other long-term strategies.
Customer acceptability	• Positive feedback from regulators and stakeholders on the consideration of customer affordability and our approach to customer engagement; • Stakeholders recognised the importance and engaging with customers and educating them on the issues and needs for investment; • Participants also raised some areas for improvement: Bill impact and customer affordability; Customer views; and what is delivered through operating costs and maintenance investment (base) versus new capacity or new capability investment (enhancement).
Storm overflows	• Feedback was relatively neutral from both regulators and stakeholders as they acknowledged the work UUW had done to set out a future plan for storm overflow; • Overall support for the step change that is required in order to improve storm overflow performance; • More detail is required relating to: timescales, milestones and costs; and water quality monitoring.
Wider strategic ambition of the DWMP	• Positive feedback from both regulators and stakeholders on the consideration of wider strategic and environmental outcomes; • Areas for improvement raised covered the following themes: Planning objectives; Data and methodologies for assessing the risk; Water quality; and SEA .
DWMP document structure and content	• Several regulators complimented UUW on the structure and content of the Draft DWMP with particular mention of the customer geospatial platform; • Areas for improvement were highlighted for the following themes: Structure and accessibility of the plan; the approach and response to consultation; and assurance and governance processes.

4.3.4 The Statement of Response to the consultation describes how the responses to the consultation were taken into account in formalising the Final DWMP.

5. The reasons for choosing the DWMP as adopted, in light of the other reasonable alternatives dealt with

5.1 Reasons for the selection of the final DWMP

5.1.1 UUW has chosen the final DWMP using industry good practice methods. This includes consideration of technical feasibility, financial costs and benefits, and quantified impacts on the environment and community, taking into account the findings of the SEA, HRA and WFD Assessment as well as ongoing engagement and input from customers and key stakeholders.

5.1.2 The overarching approach in the DWMP is set out in the established 12 Planning Objectives which set out the long term objectives. Development of the Planning Objectives included adding two objectives related to external flooding and flooding of open spaces. The 12 Planning Objectives form the broader context within which the consideration of options took place.

5.1.3 Through the options development phase of the DWMP process UUW looked to mitigate the risks identified to customers through the Baseline Risk and Vulnerability Assessment (BRAVA). In recognition of the nature of drainage and wastewater, UUW used an iterative screening process and approached options in a holistic way. UUW developed option blends comprised of different options to address the identified challenges and risks, The range of management areas and interventions considered included (inter alia):

- Combined and Foul Sewer Systems;
- Customer Side Management;
- Indirect measures Influencing policy;
- Sludge;
- Wastewater Treatment;
- Surface Water Management.

5.1.4 This approach to optioneering allowed UUW to meet multiple performance targets even if all risks could not be resolved. This holistic approach supported the use of partial options when managing risk. UUW could explore nature based-solutions and operational improvements utilising innovative technology. The use of option blends also allows for incremental improvements.

5.1.5 UUW utilised a screening approach which involved the following aspects to determine the preferred options and reject the alternatives:

- iterative screening approach was used to narrow down and ‘reject’ unfeasible options.
- assessment of the technical and geographical feasibility of options within drainage areas.
- The establishment of cost, performance and wider risks/benefits to derive a smaller list of ‘feasible’ options.

- The preferred options were determined:
  - based on the variety of combinations,
  - considering any wider benefits through the six capitals[10] approach, and
  - assessing them against the option hierarchy which prioritised blue-green solutions.

5.1.6 The investment requirements through the Water Industry National Environment Programme (WINEP) were also explicitly considered through the BRAVA process.

Finalisation of the DWMP

5.1.7 The Statement of Response sets out how the finalisation of the DWMP has taken into account feedback on the draft DWMP and outlines how UUW has taken further action. The final DWMP:

- provides greater clarity and transparency on the approach to options development and the programme appraisal stages of the DWMP process.
- includes further optimisation to ensure a holistic view of investment required to ensure robust and resilient drainage and wastewater services over the long-term.
- is closely aligned with the development of the WINEP throughout the stages of the finalisation of the DWMP. Further WINEP information is included within the Strategic Planning Area plans.
- provides a clear methodology for identifying those schemes, including the rationale for not progressing with certain schemes.
- provides greater clarity on the storm overflows programme and how the DWMP is aligned with the WINEP and investment cycle 2020-2025 ambitions, where possible.
- includes continuous water quality monitoring requirements as finalised by regulators, which are to be included in UUWs WINEP submission as well as the final DWMP.
- sets out likely customer bill impacts.

5.1.8 The DWMP will be renewed on a five yearly basis. UUW will continue to develop the DWMP into cycle 2.

[10] A stock of value that are affected or transformed by activities or outputs of an organisation. This includes reporting impacts on natural, social, human, intellectual, manufactured, and financial, 'capital'.

6. The measures decided concerning monitoring

6.1 Monitoring the effects of the DWMP

6.1.1 The SEA Regulations require the significant environmental effects of implementing a plan to be monitored. Monitoring the effects of the DWMP can help to answer questions such as:

- Were the SEA predictions of effects accurate?
- Is the DWMP contributing to the achievement of the SEA objectives?
- Are mitigation measures performing as well as expected?
- Are there any adverse effects? Are these within acceptable limits, or is remedial action desirable?

6.1.2 UUW expects to monitor the effects of the DWMP alongside the other impacts of its operations, and as such, is likely to rely on existing sources of information that are collected either by UUW or by other relevant organisations such as the Environment Agency, Natural England or Natural Resources Wales. For example, UUW already collects certain data for an annual review process (the Annual Performance Report) that is submitted to the Office of Water Services (Ofwat) and their own environmental reporting.

6.1.3 Consistent with the proposals of the Environmental Report, potential effects against all the SEA objectives have been included in the monitoring framework, which is set out in **Table 6.1**. UUW will take a broad view of the findings of their ongoing monitoring processes to identify whether the DWMP has any significant unforeseen effects. Where these are identified, UUW may be required to put in place specific monitoring arrangements and will consider how best to mitigate or avoid the adverse consequences.

Table 6.1 Indicators for Monitoring Effects

SEA Objective	Indicator	Source of Information	Commentary
1. To protect, restore and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species, enhanced ecosystem resilience, habitat connectivity and creation and contribute to the sustainable management of natural habitats and ecosystems.	Condition of specific protected sites (e.g. SACs, SPAs, SSSIs)	United Utilities Water (UUW), Environment Agency, Natural England (NE), Natural Resources Wales (NRW)	Additionally, open communication between Environment Agency, NE and UUW results in up-to-date information and identification of any potential issues. NRW included, given the potential to consider sites in Wales.

SEA Objective	Indicator	Source of Information	Commentary
	Biological monitoring (macroinvertebrates, macrophytes, fisheries, bird surveys)	UUW, Environment Agency, NRW	Monitoring/investigations support this indicator.
2. To protect and enhance soil quantity, quality and functionality and geodiversity and ensure the appropriate and efficient use of land.	Area of previously undeveloped land used during construction	UUW	UUW could record the area of previously undeveloped land that is built on as a result of the DWMP scheme, linked to biodiversity net gain/resilience assessment completed.
	Condition of sites designated for geological interest (e.g. geological SSSIs) on water industry land holdings	UUW, NE, NRW	Previous studies may also be used to inform monitoring and assessment. NRW included, given the potential to consider sites in Wales.
3. To protect and enhance the quality and quantity of surface and groundwater resources.	River flows, river levels, lake and reservoir levels. Water quality of surface waters. Groundwater levels, recharge characteristics and abstracted groundwater quality	UUW, Environment Agency	Previous studies may also be used to inform monitoring and assessment.
4. To reduce or manage flood risk.	Internal Sewer Flooding External Sewer Flooding Outcomes from the Catchment System Thinking (CaST) which provides a mechanism to understand the vulnerability of the sewer catchment to flooding as a result of an extreme wet weather event.	UUW,	UUW measure the number of incidents per year and keep a record of all flooding incidents per year.
5. To minimise emissions of pollutant gases and particulates and enhance air quality.	Nitrogen Oxide (NOx) per unit of renewable energy generated from bioresources	UUW	UUW measure NOx generated through digestion processes used to treat sewage sludge from wastewater treatment.
	Number of vehicle movements/distance travelled	UUW	UUW could considered recording the number of vehicle movements and

SEA Objective	Indicator	Source of Information	Commentary
			distance travelled as an indicator of air quality impacts during implementation.
6. To reduce greenhouse gas emissions.	Quantity of greenhouse gas emissions per megalitre of water supplied.	UUW	UUW energy managers can use company data, and guidance from the UKWIR greenhouse gas workbook and BEIS (Department for Business, Energy & Industrial Strategy) conversion factors to derive this information.
	Energy use used in the operation of options.	UUW	UUW should hold and record energy consumption data e.g. via accounts / invoices.
	Renewable energy generated or purchased.	UUW	UUW should record renewable energy generation data, in addition to data on renewable energy purchased e.g. via accounts / invoices.
7. To adapt and improve resilience to the threats of climate change.	Internal Sewer Flooding External Sewer Flooding Outcomes from the Catchment System Thinking (CaST) which provides a mechanism to understand the vulnerability of the sewer catchment to flooding as a result of an extreme wet weather event.	UUW, Environment Agency	UUW measure the number of incidents per year and keep a record of all flooding incidents per year.
8. To promote a sustainable economy and maintain and enhance the economic and social well-being of local communities.	Number of UUW sites with public access which provide sporting, recreational and leisure resources and number of visits per year.	UUW	UUW hold information on the number of annual visitors to sites where specific visitor facilities are provided. These could be analysed to determine effects of operation on visitor use.
	Planned residential new development (informing predicted growth forecast to target catchments requiring investigations for	UUW	UUW examine information on planned growth and forecasts across LPA within the area.

SEA Objective	Indicator	Source of Information	Commentary
	potential future capacity constraints).		
9. To protect and enhance human health and well-being.	Compliance with drinking water standards at customers' taps (%).	UUW	UUW reports these data to Ofwat as part of the statutory returns process (Annual Performance Report) and to the Drinking Water Inspectorate.
	Compliance with water quality standards under the EC Bathing Waters Directive.	Environment Agency	Environment Agency monitors the compliance of bathing waters and report this annually.
	Number of nuisance-related complaints e.g. noise, dust.	UUW	UUW could record the number of nuisance-related complaints made in relation to implementation of the DWMP.
	Pollution Incidents Internal Sewer Flooding External Sewer Flooding Sewer Collapses Sewer Blockages	UUW, Environment Agency	UUW measure the number of pollution incidents per year and keep a record of all flooding incidents per year and maintain a list of intermittent discharges.
10. To promote and enhance the sustainable and efficient use of resilient water resources.	Leakage Water saved through demand management/ water efficiency measures	UUW	UUW report these data to Ofwat as part of the annual returns process.
11. To minimise waste, promote resource efficiency and move towards a circular economy.	Amount of recycled / reused materials used	UUW (contractors/consultants)	Information on the use of recycled / reused materials should be held by construction managers and accounts (contractors / consultants accounts, waste or procurement records).
	Proportion of waste sent to landfill	UUW (services data)	Information on waste disposal to landfill should be held by UUW.
	Chemicals Use in Water Treatment	UUW (services data)	Information (quantities, composition) on chemical use should be held in accounts.

SEA Objective	Indicator	Source of Information	Commentary
12. To conserve and enhance the historic environment including the significance of heritage assets and their settings and archaeological important sites.	Loss / damage or discovery / protection of cultural, historic and industrial heritage features.	UUW, Historic England	Historic England monitor the condition of all statutorily protected monuments.
13. To conserve, protect and enhance landscape and townscape character and visual amenity.	Loss or damage to landscape character and features of designated sites.	UUW	UUW could record the number and size of infrastructure built within designated landscape sites.

Appendix A
SEA Quality Assurance Checklist

Table A.1 details the SEA Regulations' requirements of the Post Adoption Procedures and indicates where relevant information required can be found in this report.

Table A.1 Compliance of this report with the requirements of the SEA Regulations

SEA Regulations Requirement	Location in the Post Adoption Statement (where appropriate)
Information as to adoption of plan or programme (SEA regulation 16)	
(1) As soon as reasonably practicable after the adoption of a plan or programme for which an environmental assessment has been carried out under these Regulations, the responsible authority shall - **(a) make a copy of the plan or programme and its accompanying environmental report available at its principal office for inspection by the public at all reasonable times and free of charge; and** **(b) take such steps as it considers appropriate to bring to the attention of the public** **(i) the title of the plan or programme;** **(ii) the date on which it was adopted;** **(iii) the address (which may include a website) at which a copy of it and of its accompanying environmental report, and of a statement containing the particulars specified in paragraph (4), may be viewed or from which a copy may be obtained;** **(iv) the times at which inspection may be made; and** **(v) that inspection may be made free of charge.**	A copy of the DWMP and accompanying reports and documentation is available at: https://www.unitedutilities.com/corporate/about-us/our-future-plans/Our-long-term-plans/ A paper copy of the DWMP, Environmental Report and this Post Adoption Statement are available for public viewing at: Haweswater House Lingley Mere Business Park Lingley Green Avenue Great Sankey Warrington WA5 3LP The office is open from 9am until 5pm Monday to Friday.
(2) As soon as reasonably practicable after the adoption of a plan or programme - **(a) the responsible authority shall inform—** **(i) the consultation bodies;** **(ii) the persons who, in relation to the plan or programme, were public consultees for the** **purposes of regulation 13; and**	A copy of the DWMP and accompanying reports and documentation (including the SEA Environmental Report) is available at: https://www.unitedutilities.com/corporate/about-us/our-future-plans/Our-long-term-plans/ This Post Adoption Statement addresses (iii) and contains particulars specified in paragraph (4) as outlined below.

SEA Regulations Requirement	Location in the Post Adoption Statement (where appropriate)
(iii) where the responsible authority is not the Secretary of State, the Secretary of State; **and** **(b) the Secretary of State shall inform the Member State with which consultations in relation to the matters referred to in paragraph 3.** **(3) The matters are -** **(a) that the plan or programme has been adopted;** **(b) the date on which it was adopted; and** **(c) the address (which may include a website) at which a copy of—** **(i) the plan or programme, as adopted,** **(ii) its accompanying environmental report, and** **(iii) a statement containing the particulars specified in paragraph (4),** **may be viewed, or from which a copy may be obtained.**	
(4) The particulars referred to in paragraphs (1)(b)(iii) and (3)(c)(iii) are -	
(a) how environmental considerations have been integrated into the plan or programme;	Section 2
(b) how the environmental report has been taken into account;	Section 3
(c) how opinions expressed in response to - **(i) the invitation referred to in regulation 13(2)(d);** **(ii) action taken by the responsible authority in accordance with regulation 13(4),** **- have been taken into account;**	Section 3 and United Utilities Statement of Response, available at: https://www.unitedutilities.com/corporate/about-us/our-future-plans/Our-long-term-plans/
(d) how the results of any consultations entered into under regulation 14(4) have been taken into account;	Not applicable - no transboundary consultation with EU Member States took place
(e) the reasons for choosing the plan or programme as adopted, in the light of the other reasonable alternatives dealt with; and	Section 5
(f) the measures that are to be taken to monitor the significant environmental effects of the implementation of the plan or programme.	Section 6.
Monitoring of implementation of plans and programmes (SEA regulation 17) Content	

SEA Regulations Requirement	Location in the Post Adoption Statement (where appropriate)
(1) The responsible authority shall monitor the significant environmental effects of the implementation of each plan or programme with the purpose of identifying unforeseen adverse effects at an early stage and being able to undertake appropriate remedial action.	Monitoring procedures are set out in Section 6. UUW will identify effects and undertake remedial action (as necessary) as the DWMP is implemented.
(2) The responsible authority's monitoring arrangements may comprise or include arrangements established otherwise than for the express purpose of complying with paragraph (1).	The monitoring procedures set out in Section 6 will complement existing monitoring arrangements where possible.

Appendix B
Consultation responses

Table B.1 Summary of the consultation responses (on the Environmental Report accompanying the Draft DWMP)

Respondent ID/Name	Report Section/ Consultation Question	Consultee Response Summary	Response/Action
Environment Agency **FBID-322**	Overall	The environmental report sets out comprehensively the assessment process and the findings	Support noted.
Environment Agency **FBID-322**	SEA Regulations compliance	The SEA has been carried out to SEA Regulations and used the checklist in the 'Office of the Deputy Prime Minister (2005) A Practical Guide to the Strategic Environmental Assessment Directive' to help ensure that the requirements of the SEA Regulations are met.	Support noted.
Environment Agency **FBID-322**	SEA consultation responses	All EA comments as part of consultation are responded to.	Support noted.
Environment Agency **FBID-322**	DWMP Objectives	Section 1.3 of the report sets out the purpose and structure of the DWMP. Paras 1.3.8 and 1.3.9 summarise the focus.	Comments noted
Environment Agency **FBID-322**	Baseline	Para 1.4.13 states that in the review of relevant PPPs and collation of baseline data, as well as data for England, data Scotland and Wales are also collated to address potential cross boundary effect i.e. Wales – Dee Estuary and Scotland – Solway Firth Estuary. Baseline information is stated as being analysed to identify a number of key sustainability issues. Section 3 presents an overview of baseline analysis of 'key issues relevant to draft plan and SEA'.	Comments noted.
Environment Agency **FBID-322**	Plan, policy and programme review	Section 2 of the report summarises the review undertaken of plans and programmes at international/European, national, regional, or sub-regional level, commensurate with the scope of the draft DWMP. Table 2.1 provides a list of the plans and programmes identified as relevant to the DWMP. These are summarised in Appendix B. Para 4.1.1 – Introduction to the	Comments noted.

Respondent ID/Name	Report Section/ Consultation Question	Consultee Response Summary	Response/Action
		Approach to Assessment also states that the approach adopted draws on information from the PPP review (ie Section 2 and Appendix B)	
Environment Agency **FBID-322**	Scope	Para 4.2.3 states that all SEA topics identified by Schedule 2 of the SEA Regulations have been scoped in for assessment. Section 4.2 titled 'Scope' also sets out: • Geographical scope ie geographical extent of the SEA • Timescales ie summarises the timescales applied in the SEA as short, medium and long term – duration and estimated length (years) are set out in Table 4.1	Comments noted.
Environment Agency **FBID-322**	Assessment methodology	The approach to the assessment is set out in Section 4 'Approach to the Assessment'. It states that the approach draws on information in Section 2 (review of plans and programmes) and 3 (overview of baseline analysis) of the report and Appendices B (summary of plans and programmes reviewed) and C (details of evidence used and findings from baseline analysis).	Comments noted.
Environment Agency **FBID-322**	Reasons for selection of reasonable alternatives and approach to assessment	The range of options (alternatives) being considered are set out in Table 1.1 'DWMP Generic Options' in section 1.3 UUW DWMP. The option development process is set out in Figure 1.3 (p27). Stage B of the SEA process involved (para1.4.14) 'assessing the effects (including cumulative effects) of the drainage and wastewater management proposals contained in the draft DWMP and any reasonable alternatives.'	Comments noted.
Environment Agency **FBID-322**	Identification of the likely significant environmental effects (positive and negative) that will result from the implementation of the actions within the draft DWMP	Assessment is made for both construction and operational stages and considers negative and positive impacts against each of the SEA topics. A qualitative scoring system is used. The report also assesses the Level 3 (L3): TPU drainage area plans which assess how future changes will affect catchment performance and the steps that need to be put in place to manage risks. Table 5.14 'identifies the 22 TPU catchments which are identified as strategic or complex and the number of options within each of the 22 TPU catchments that have been assessed to identify, describe and evaluate their likely significant environmental effects.' Table 5.14 sets out the options screened in for assessment. Summary tables of the	Comments noted. The PAS includes the assessment of the four additional TPUs in Appendix C.

Respondent ID/Name	Report Section/ Consultation Question	Consultee Response Summary	Response/Action
		assessment of impact at construction and operation, both positive and negative, with explanatory text are provided on p79-112. It does state that: ' There are a small number of TPUs which have not been assessed and will therefore be included between draft and final DWMP.'	
Environment Agency **FBID-322**	Potential measures to prevent, reduce and offset significant adverse effects of implementing the draft DWMP	Consideration is made of the need for mitigation although specific measures are not provided in the SEA and it is stated that proposals would need to be at the project level. It (the Environmental Report) would benefit from more detail on the mitigation measures. With regard to addressing the potential measures needed to offset the impacts of the options this is largely left to the project scale. As work progresses it would however to useful to check to see if there are larger scale opportunities for offsetting impacts that could result in wider benefits both for people and wildlife.	The identification of mitigation in Section 5.6 of the Environmental Report and within the detailed assessments is considered proportionate to the detail of the DWMP and the strategic nature of the SEA assessment. Further specific mitigation will be considered at a scheme level.
Environment Agency **FBID-322**	Incorporation of findings in the ER into the draft DWMP	Section 4.4 sets out the assessment methodology and states the staged process for assessment complementary to the plan. .	Comments noted.
Environment Agency **FBID-322**	In-combination and cumulative effects	Consideration of secondary, cumulative and synergistic effects is given in Section 5.4. Table 5.63 sets out the potential for cumulative effects of the DWMP against each of the Proposed SEA objectives. Reference to where cumulative effects have been considered occur in other sections of the report e.g. 4.2.6 relating to geographics scope. This table also considers the potential for cumulative effects with other plans and programmes.	Comments noted.

Respondent ID/Name	Report Section/ Consultation Question	Consultee Response Summary	Response/Action
Environment Agency **FBID-322**	Monitoring	Section 6.4 addresses 'monitoring the effects of the DWMP'. Reference is made to the need for Annual Review of the DWMP in para 6.4.6 and what the review will comprise.	Comment noted.
Environment Agency **FBID-322**	Conclusion and Next Steps	The Report sets out the conclusions and next steps	Comment noted.
Environment Agency **FBID-322**	NTS	NTS is provided in accordance with the SEA Regulations	Comment noted.
FBID-21	Q.51 Do you think that the Environmental Report has correctly identified the likely significant effects of the draft DWMP?	States that it is difficult to determine whether LSE all identified, given the structure and presentation of the SEA Environmental Report. Considers that the time and capacity for the respondent was not available to assess locational options set out in Section 5.3 and work with Local Biological Record Centres to assess against international, national and recent key species records. Additionally considers that a map-based function (ideally with GIS) States that it would seem more appropriate for UUW to already have undertaken this work with the relevant local biological record centres itself.	The response is noted. The SEA has considered the potential effects in relation to internationally designated sites (SPA, SAC, Ramsar), nationally designated sites (such as SSSI) and local and non-designated sites (such as LWS) and species. This was considered under the assessment of SEA Objective 1 (biodiversity, flora and fauna). Consideration of these matters was informed by the HRA assessments, where relevant. Furthermore, UUW took into consideration these matters on development of the options for inclusion in the Draft DWMP. The approach to preparation of the documents such as DWMP and SEA is

Respondent ID/Name	Report Section/ Consultation Question	Consultee Response Summary	Response/Action
			always developing and further consideration will be given to web based mapping of facilities in future iterations of the DWMP.
FBID-21	Q.51a If not, what other significant effects do you think we have missed, and why?	States that in respect to monitoring SEA Objective 1 (biodiversity, flora and fauna) Natural England has the statutory responsibility to monitor the condition of SPA, SAC and SSSI within England. The respondent states that NE is significantly under-resourced in its ability to do so regularly and this may constrain its reliability as a source of up-to-date information on that indicator, at least during the more proximate timeframe of the DWMP.	Comment noted. UUW will work with NE to support effective consideration of the effects of delivering the DWMP.
FBID-324	Q.53 Do you agree with the proposed arrangements for monitoring the significant effects of the implementation of the DWMP?	States that broadly agrees with proposed arrangements but that more needs to be done.	The general support is noted although no further information is provided as to how the respondent considers more could be done to enhance the monitoring arrangements proposed. The monitoring proposals set out in the Environmental Report have been reviewed and are considered to provide a robust basis to monitor effects. The finalised monitoring proposals are set out in Table 6.1 of this report.

Appendix C
Assessment of four additional TPUs

Table C.1 identifies the four strategic or complex TPU catchments that have been assessed following publication of the SEA Environmental Report and the number of options that have been assessed within each TPU catchment.

Table C.1 Summary of options assessed by TPU catchment

TPU Catchment	Number of options screened in
Alsager	1
Kendal	1
Urmston	1
Wilmslow	1

The scoring system applied to the assessments is the same as applied in the Environmental Report and replicated in **Table C.2**. The definitions of significance applied are those contained in Appendix D of the Environmental Report.

Table C.2 Qualitative Scoring System

Score	Description	Symbol
Major/Significant Positive Effect	Significant positive effect of the option on this objective	**+++**
Moderate Positive Effect	Moderate positive effect of the option on this objective	**++**
Minor Positive Effect	Minor positive effect of the option on this objective	**+**
Neutral	Neutral effect of the option on this objective	**0**
Minor Negative Effect	Negative effect of the option on this objective	**-**
Moderate Negative Effect	Moderate effect of the option on this objective	**--**
Major/Significant Negative Effect	Significant negative effect of the option on this objective	**---**
Uncertain	The option has an uncertain relationship to the objective or the relationship is dependent on the way in which the aspect is managed. In addition, insufficient information may be available to enable an assessment to be made.	**?**

TPU catchment: Alsager

Option Assessment Information	
Option ID	Increase treatment capacity
Option Name	Alsager
Option Description	Increase treatment capacity

Option	Stage	1. Biodiversity	2. Soils, Geodiversity and Land Use	3. Water Quality	4. Flood Risk	5. Air Quality	6. Greenhouse Gas Emissions	7. Climate Change Resilience	8. Economic and Social Wellbeing	9. Human Health	10. Water Resources	11. Waste and Materials	12. Cultural Heritage	13. Landscape
Alsager	Construction (negative)	-	0	0	0	0	0	0	0	0	0	0	0	-
	Construction (positive)	0	+	0	0	0	0	0	0	0	0	+/?	0	0
	Operation (negative)	0	0	0	0	0	-	0	0	0	0	-	0	-
	Operation (positive)	0	0	0	0	0	0	0	+	+	0	0	0	0

Construction

1. **Biodiversity**: There are no European/international sites within 1km of the WwTW site. As such, and as it is assumed that works will take place within the existing WwTW site, significant or significant adverse effects on European/international sites are expected to be avoidable or mitigable with established scheme-level avoidance or mitigation measures. There are no national or local biodiversity sites within 1km of the WwTW site. More generally construction of the scheme could affect non-designated habitats and species through disturbance (e.g. noise, vibration, dust), however, as works will take place within the existing WwTW site, any effects in this regard are anticipated to be minor.

2. **Soils**: It is assumed that the option would be constructed within the existing operational boundary of the WwTW site and would not require any additional land take, hence a minor positive effect has been identified.

3. **Water Quality**: it is not expected that construction of this option would affect water quality, due to location, the absence of connectivity and provided best practices are adhered to and mitigation implemented.

4. **Flood Risk**: The WwTW site is not located within an area at risk of flooding, however, it is noted that it is situated immediately adjacent to an area of Flood Zone 3. The construction of the option would be unlikely to increase flood risk elsewhere.

5. **Air Quality**: The option is located outside an Air Quality Management Area (AQMA and is not considered to be of sufficient scale and duration to be the cause of any adverse effects on air quality.

6. **Greenhouse Gas Emissions**: The construction of the option would require materials (concrete and steel) with embodied carbon; however, it is not anticipated that there would be any effect on carbon emissions (embodied carbon would be below the lower threshold for minor effect (100tCO2e)).

7. **Climate Change Resilience**: The site of the option would be located outside an area at risk of flooding and so would not be vulnerable to the effects of climate change (flooding).

8. **Economic and Social Wellbeing**: Due to the small scale of the option and the limited capital expenditure, it is not anticipated that there would be any effect on economic or social wellbeing.

9. **Health:** Due to the rural location of the option, away from any residential and recreational receptors, it is not anticipated there would be any effects on health during construction.

10. **Water resources:** It is not expected that construction of this option would affect water resources and the construction effects are assessed as neutral.

11. **Waste and resources:** The construction of the option would largely rely on existing infrastructure and only require small quantities of additional materials to realise design capacity. Neutral effects are assessed. There is the possibility that waste building materials such as steel and plastic, could potentially be re-used or recycled. However, the significance of this is currently unknown.

12. **Historic environment:** The construction site is within 1km of a Listed Building (Betchton Farm 630m). However, due to the distance between the works and this heritage asset and as the works will take place within the existing WwTW site, it is not anticipated that there would be any effects.

13. **Landscape:** The development site is not within or in close proximity to any landscape designations but construction would have short term, temporary negative effects on local landscape/townscape character and visual amenity. However, as works are expected to take place within the existing WwTW site, any effects in this regard are anticipated to be minor.

Operation

1. **Biodiversity**: Any increase in discharges resulting from this option are assumed to be consented and as such it is not expected that there would be any effects on any downstream sites/features (if present). The option may result in an increase in noise disturbance to nearby habitats and species, however, as the option would involve an increase in treatment capacity at the existing operational WwTW site, any effects in this regard are anticipated to be negligible.

2. **Soils**: No effects on land use, soils or geodiversity are anticipated during the operational phase of the option.

3. **Water Quality**: Any increase in discharge volumes associated with the operation of this option is assumed to be consented (in terms of voumes and concentrations of pollutants) and as such it is assumed there would be no effect on water quality, however, due to the lack of information on discharge volumes, there remains some uncertainty.

4. **Flood Risk**: The operation of the option would have no effect on flood risk.

5. **Air Quality**: The operation of the option is not expected to have effects on air quality.

6. **Greenhouse Gas Emissions**: The operation of the option would involve minor carbon emissions (less than 100 tonnes CO2e/year).

7. **Climate Change Resilience**: As noted above, the site of the option would be located outside an area at risk of flooding and so would not be vulnerable to the effects of climate change (flooding).

8. **Economic and Social Wellbeing**: The operation of the option would involve a minor increase in the wastewater treatment capacity provided to the community.

9. **Health:** The operation of the option would involve a minor increase in the wastewater treatment capacity provided to the community.

10. **Water resources:** It is not expected that the operation of this option would affect water resources and the operational effects are assessed as neutral.

11. **Waste and resources:** The operation of the option would likely require minor quantities of raw materials/chemicals and electricity for the treatment of wastewater/sewage, which would have a minor negative effect on this objective.

12. **Historic environment**: There would be no operational effects on designated cultural heritage assets.

13. **Landscape:** New permanent above ground infrastructure associated with this option may have adverse effects on landscape/townscape character and visual amenity, however, as any new infrastructure would be situated within the existing WwTW site, any effects in this regard are anticipated to be minor.

TPU catchment: Kendal

Option Assessment Information	
Option ID	Increase treatment capacity
Option Name	Kendal
Option Description	Increase treatment capacity

Option	Stage	1. Biodiversity	2. Soils, Geodiversity and Land Use	3. Water Quality	4. Flood Risk	5. Air Quality	6. Greenhouse Gas Emissions	7. Climate Change Resilience	8. Economic and Social Wellbeing	9. Human Health	10. Water Resources	11. Waste and Materials	12. Cultural Heritage	13. Landscape
Alsager	Construction (negative)	-	0	-	---	-	--	--	0	-	0	-	--	-
	Construction (positive)	0	+	0	0	0	0	0	+	0	0	+/?	0	0
	Operation (negative)	0	0	0	---	0	---	--	0	0	0	-	-	-
	Operation (positive)	0	0	0	0	0	0	0	+	+	0	0	0	0

Construction

1. **Biodiversity**: The option is within 1km of the River Kent SAC (within 10m of the option). The HRA of the DWMP option concludes that for option construction that effects are possible (pathways present) but significant or significant adverse effects clearly avoidable with established scheme-level avoidance or mitigation measures. The option is within within 1km of River Kent and Tributaries SSSI (with 10m of boundary). Construction of the scheme could affect this designated feature through noise and disturbance although such effects could be reduced through appropriate mitigation and best practice construction measures. More generally construction of the scheme could affect non-designated habitats and species through direct landtake or disturbance (e.g. noise, vibration, dust).

2. **Soils**: It is assumed that the option would be constructed within the existing operational boundary of the WwTW site and would not require any additional land take, hence a minor positive effect has been identified.

3. **Water Quality**: The WwTW site is situated adjacent to the banks of the River Kent. Construction could therefore introduce pollution/debris into the river (although this is likely to be avoided through appropriate mitigation).

4. **Flood Risk**: The WwTW site is situated almost entirely within Flood Zone 3 and therefore may be liable to flooding during the construction period (depending on the timing of installation). The construction of the option would be unlikely to increase flood risk elsewhere.

5. **Air Quality**: The option is located outside an Air Quality Management Area (AQMA and is not considered to be of sufficient scale and duration to be the cause of any adverse effects on air quality. Minor negative effects are assessed.

6. **Greenhouse Gas Emissions**: The construction of the option would require the use of materials (concrete and steel) with a moderate amount of embodied carbon (1,000 to <7,500tCO2e).

7. **Climate Change Resilience**: As noted above, the site of the option would be situated mainly within Flood Zone 3 and in consequence, the sites of the construction of this infrastructure would be vulnerable to the effects of climate change (flooding).

8. **Economic and Social Wellbeing**: The construction of the option would involve a minor capital expenditure (between £1m to <£5m).), resulting in a minor positive effect on the local economy associated with potential employment opportunities and supply chain benefits generated by the development together with spend by construction workers and contractors in the local economy.

9. **Health:** Construction emissions, noise and disturbance may affect proximate residential receptors. However, effects are likely to be temporary in nature.

10. **Water resources:** It is not expected that construction of this option would affect water resources and the construction effects are assessed as neutral.

11. **Waste and resources:** The construction of the option would involve minor quantities of material (concrete and steel). There is the possibility that waste building materials such as steel and plastic, could potentially be re-used or recycled. However, the significance of this is currently unknown.

12. **Historic environment:** The construction site is within 1km of 2 Scheduled Ancient Monuments (Watercrook Roman fort and civil settlement (20m) and Nether Bridge (950m)), 16 Listed Buildings (the closest being within 160m of the site). Given the proximity of the Scheduled Monument to the WwTW site and therefore the potential for effects on the setting of this high value heritage asset, the option has been assessed as having a moderate negative effect on this objective. Due to the distance between the works and the remaining heritage assets and as the works will take place within the existing WwTW site, it is not anticipated that there would be any effects on these assets.

13. **Landscape:** The development site is not within or in close proximity to any landscape designations, but construction would have short term, temporary negative effects on local landscape/townscape character and visual amenity. However, as works are expected to take place within the existing WwTW site, any effects in this regard are anticipated to be minor.

Operation

1. **Biodiversity**: Any increase in discharges resulting from this option are assumed to be consented and as such it is not expected that there would be any effects on any downstream sites/features (if present). The option may result in an increase in noise disturbance to nearby habitats and species, however, as the option would involve an increase in treatment capacity at the existing operational WwTW site, any effects in this regard are anticipated to be negligible.

2. **Soils**: No effects on land use, soils or geodiversity are anticipated following the reinstatement of land following the construction stage.

3. **Water Quality**: Any increase in discharge volumes associated with the operation of this option is assumed to be consented (in terms of volumes and concentrations of pollutants) and as such it is assumed there would be no effect on water quality, however, due to the lack of information on discharge volumes, there remains some uncertainty.

4. **Flood Risk**: The WwTW site is situated almost entirely within Flood Zone 3 and therefore may be liable to flooding during the operational period, however, it would be unlikely to increase flood risk elsewhere.

5. **Air Quality**: The operation of the option is not expected to have effects on air quality.

6. **Greenhouse Gas Emissions**: The operation of the option would involve significant carbon emissions (>1,000tCO2e/year).

7. **Climate Change Resilience**: As noted above, the site of the option would be situated partially within Flood Zones 3 and in consequence, the option would be vulnerable to the effects of climate change (flooding) during operation.

8. **Economic and Social Wellbeing**: The operation of the option would involve a minor increase in the wastewater treatment capacity provided to the community.

9. **Health:** The operation of the option would involve a minor increase in the wastewater treatment capacity provided to the community.

10. **Water resources:** It is not expected that the operation of this option would affect water resources and the operational effects are assessed as neutral.

11. **Waste and resources:** The operation of the option would likely require moderate quantities of raw materials/chemicals and electricity for the treatment of wastewater/sewage, which would have a moderate negative effect on this objective.

12. **Historic environment**: It is not anticipated that the operation of the option would have significant effects on any heritage assets; however, new above ground infrastructure may have minor effects on the settings of nearby assets and features.

13. **Landscape:** New permanent above ground infrastructure associated with this option may have adverse effects on landscape/townscape character and visual amenity, however, as any new infrastructure would be situated within the existing WwTW site, any effects in this regard are anticipated to be minor.

TPU catchment: Urmston

Option Assessment Information	
Option ID	Increase treatment capacity
Option Name	Urmston
Option Description	Increase treatment capacity

Option	Stage	1. Biodiversity	2. Soils, Geodiversity and Land Use	3. Water Quality	4. Flood Risk	5. Air Quality	6. Greenhouse Gas Emissions	7. Climate Change Resilience	8. Economic and Social Wellbeing	9. Human Health	10. Water Resources	11. Waste and Materials	12. Cultural Heritage	13. Landscape
Alsager	Construction (negative)	-	0	-	--	0	0	-	0	-	0	0	0	-
	Construction (positive)	0	+	0	0	0	0	0	0	0	0	+/?	0	0
	Operation (negative)	0	0	0	--	0	---	-	0	0	0	-	0	-
	Operation (positive)	0	0	0	0	0	0	0	+	+	0	0	0	0

Construction

1. **Biodiversity**: There are no European/international sites within 1km of the WwTW site. As such, and as it is assumed that works will take place within the existing WwTW site, significant or significant adverse effects on European/international sites are expected to be avoidable or mitigable with established scheme-level avoidance or mitigation measures. There are no national or local biodiversity sites within 1km of the WwTW site. More generally construction of the scheme could affect non-designated habitats and species through disturbance (e.g. noise, vibration, dust), however, as works will take place within the existing WwTW site, any effects in this regard are anticipated to be minor.

2. **Soils**: It is assumed that the option would be constructed within the existing operational boundary of the WwTW site and would not require any additional land take, hence a minor positive effect has been identified.

3. **Water Quality**: The WwTW site is situated adjacent to the banks of the Manchester Ship Canal. Construction could therefore introduce pollution/debris into the waterbody and downstream waterbodies (although this is likely to be avoided through appropriate mitigation).

4. **Flood Risk**: The WwTW site is located partially (<40%) within Flood Zone 3 and within Flood Zone 2 and therefore may be liable to flooding during the construction period (depending on the timing of installation). The construction of the option would be unlikely to increase flood risk elsewhere.

5. **Air Quality**: The option is located outside an Air Quality Management Area (AQMA) and is not considered to be of sufficient scale and duration to be the cause of any adverse effects on air quality.

6. **Greenhouse Gas Emissions**: Due to the small scale of the option and the limited capital expenditure, it is not anticipated that there would be any effect on carbon emissions.

7. **Climate Change Resilience**: As noted above, the site of the option would be partially within Flood Zones 3 and wholly within Flood zone 2 and in consequence, the sites of the construction of this infrastructure would be vulnerable to the effects of climate change (flooding).

8. **Economic and Social Wellbeing**: Due to the small scale of the option and the limited capital expenditure, it is not anticipated that there would be any effect on economic or social wellbeing.

9. **Health:** Construction emissions, noise and disturbance may affect proximate residential receptors. However, effects are likely to be temporary in nature.

10. **Water resources:** It is not expected that construction of this option would affect water resources and the construction effects are assessed as neutral.

11. **Waste and resources:** The construction of the option would largely rely on existing infrastructure and only require small quantities of additional materials to realise design capacity. Neutral effects are assessed. There is the possibility that waste building materials such as steel and plastic, could potentially be re-used or recycled. However, the significance of this is currently unknown.

12. **Historic environment:** The construction site is within 1km of a Listed Building (Irlam and Cadishead War Memorial at 720m from option), However, due to the distance between the works and this heritage asset and as the works will take place within the existing WwTW site, it is not anticipated that there would be any effects.

13. **Landscape:** The development site is not within or in close proximity to any landscape designations, but construction would have short term, temporary negative effects on local landscape/townscape character and visual amenity. However, as works are expected to take place within the existing WwTW site, any effects in this regard are anticipated to be minor.

Operation

1. **Biodiversity**: Any increase in discharges resulting from this option are assumed to be consented and as such it is not expected that there would be any effects on any downstream sites/features (if present). The option may result in an increase in noise disturbance to nearby habitats and species, however, as the option would involve an increase in treatment capacity at the existing operational WwTW site, any effects in this regard are anticipated to be negligible.

2. **Soils**: No effects on land use, soils or geodiversity are anticipated following the reinstatement of land following the construction stage.

3. **Water Quality**: Any increase in discharge volumes associated with the operation of this option is assumed to be consented (in terms of volumes and concentrations of pollutants) and as such it is assumed there would be no effect on water quality, however, due to the lack of information on discharge volumes, there remains some uncertainty.

4. **Flood Risk**: The WwTW site is partially (<40%) within Flood Zone 3 and within Flood Zone 2 and therefore may be liable to flooding during the operational period, however, it would be unlikely to increase flood risk elsewhere.

5. **Air Quality**: The operation of the option is not expected to have effects on air quality.

6. **Greenhouse Gas Emissions**: The operation of the option would involve significant carbon emissions (>1,000tCO2e/year).

7. **Climate Change Resilience**: As noted above, the site of the option would be situated partially within Flood Zones 2/3 and in consequence, the option would be vulnerable to the effects of climate change (flooding) during operation.

8. **Economic and Social Wellbeing**: The operation of the option would involve a minor increase in the wastewater treatment capacity provided to the community.

9. **Health:** The operation of the option would involve a minor increase in the wastewater treatment capacity provided to the community.

10. **Water resources:** It is not expected that the operation of this option would affect water resources and the operational effects are assessed as neutral.

11. **Waste and resources:** The operation of the option would likely require moderate quantities of raw materials/chemicals and electricity for the treatment of wastewater/sewage, which would have a moderate negative effect on this objective.

12. **Historic environment**: There would be no operational effects on designated cultural heritage assets.

13. **Landscape:** New permanent above ground infrastructure associated with this option may have adverse effects on landscape/townscape character and visual amenity, however, as any new infrastructure would be situated within the existing WwTW site, any effects in this regard are anticipated to be minor.

TPU catchment: Wilmslow

Option Assessment Information	
Option ID	Increase treatment capacity
Option Name	Wilmslow
Option Description	Increase treatment capacity

Option	Stage	1. Biodiversity	2. Soils, Geodiversity and Land Use	3. Water Quality	4. Flood Risk	5. Air Quality	6. Greenhouse Gas Emissions	7. Climate Change Resilience	8. Economic and Social Wellbeing	9. Human Health	10. Water Resources	11. Waste and Materials	12. Cultural Heritage	13. Landscape
Alsager	Construction (negative)	-	0	-	---	0	0	--	0	-	0	0	0	-
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+/?	0	0
	Operation (negative)	0	0	0	---	0	---	--	0	0	0	-	0	-
	Operation (positive)	0	0	0	0	0	0	0	+	+	0	0	0	0

Construction

1. **Biodiversity**: There are no European/international sites within 1km of the WwTW site. As such, and as it is assumed that works will take place within the existing WwTW site, significant or significant adverse effects on European/international sites are expected to be avoidable or mitigable with established scheme-level avoidance or mitigation measures. There are no national or local biodiversity sites within 1km of the WwTW site. More generally construction of the scheme could affect non-designated habitats and species through disturbance (e.g. noise, vibration, dust), however, as works will take place within the existing WwTW site, any effects in this regard are anticipated to be minor.

2. **Soils**: It is assumed that the option would be constructed within the existing operational boundary of the WwTW site and would not require any additional land take, hence a minor positive effect has been identified.

3. **Water Quality**: The WwTW site is situated adjacent to the banks of the River Dean. Construction could therefore introduce pollution/debris into the river (although this is likely to be avoided through appropriate mitigation).

4. **Flood Risk**: The WwTW site is situated partially (over 40%) within Flood Zone 3 and therefore may be liable to flooding during the construction period (depending on the timing of installation). The construction of the option would be unlikely to increase flood risk elsewhere.

5. **Air Quality**: The option is located outside an Air Quality Management Area (AQMA) and is not considered to be of sufficient scale and duration to be the cause of any adverse effects on air quality.

6. **Greenhouse Gas Emissions**: The construction of the option would require materials (concrete and steel) with embodied carbon, however, it is not anticipated that there would be any effect on carbon emissions (embodied carbon would be below the lower threshold for minor effect (100tCO2e)).

7. **Climate Change Resilience**: As noted above, the site of the option would be within partially within Flood Zones 3 and in consequence, the sites of the construction of this infrastructure would be vulnerable to the effects of climate change (flooding).

8. **Economic and Social Wellbeing**: Due to the small scale of the option and the limited capital expenditure, it is not anticipated that there would be any effect on economic or social wellbeing.

9. **Health:** Construction emissions, noise and disturbance may affect proximate receptors at HMP Styal. However, effects are likely to be temporary in nature.

10. **Water resources:** It is not expected that construction of this option would affect water resources and the construction effects are assessed as neutral.

11. **Waste and resources:** The construction of the option would largely rely on existing infrastructure and only require small quantities of additional materials to realise design capacity. Neutral effects are assessed. There is the possibility that waste building materials such as steel and plastic, could potentially be re-used or recycled. However, the significance of this is currently unknown.

12. **Historic environment:** The construction site is within 1km of five Listed Buildings (the nearest being Pownall Hall at 630m from the site). However, due to the distance and intervening built development between the works and these heritage assets and as the works will take place within the existing WwTW site, it is not anticipated that there would be any effects.

13. **Landscape:** The development site is not within or in close proximity to any landscape designations, but construction would have short term, temporary negative effects on local landscape/townscape character and visual amenity. However, as works are expected to take place within the existing WwTW site, any effects in this regard are anticipated to be minor.

Operation

1. **Biodiversity**: The operation of the option would have no effect on any designated features.

2. **Soils**: No effects on land use, soils or geodiversity are anticipated following the reinstatement of land following the construction stage.

3. **Water Quality**: Any increase in discharge volumes associated with the operation of this option is assumed to be consented (in terms of volumes and concentrations of pollutants) and as such it is assumed there would be no effect on water quality, however, due to the lack of information on discharge volumes, there remains some uncertainty.

4. **Flood Risk**: The WwTW site is partially (over 40% of the site) within Flood Zone 3 and therefore may be liable to flooding during the operational period, however, it would be unlikely to increase flood risk elsewhere.

5. **Air Quality**: The operation of the option is not expected to have effects on air quality.

6. **Greenhouse Gas Emissions**: The operation of the option would involve significant carbon emissions (>1,000tCO2e/year).

7. **Climate Change Resilience**: As noted above, the site of the option would be situated partially within Flood Zones 3 (over 40% of the site) and in consequence, the option would be vulnerable to the effects of climate change (flooding) during operation.

8. **Economic and Social Wellbeing**: The operation of the option would involve a minor increase in the wastewater treatment capacity provided to the community.

9. **Health:** The operation of the option would involve a minor increase in the wastewater treatment capacity provided to the community.

10. **Water resources:** It is not expected that the operation of this option would affect water resources and the operational effects are assessed as neutral.

11. **Waste and resources:** The operation of the option would likely require moderate quantities of raw materials/chemicals and electricity for the treatment of wastewater/sewage, which would have a moderate negative effect on this objective.

12. **Historic environment**: There would be no operational effects on designated cultural heritage assets.

13. **Landscape:** New permanent above ground infrastructure associated with this option may have adverse effects on landscape/townscape character and visual amenity, however, as any new infrastructure would be situated within the existing WwTW site, any effects in this regard are anticipated to be minor.

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