United Utilities Water

# Drainage and Wastewater Management Plan 2023

## Kent Leven DWMP

### Document Reference: SPA_06

May 2023

United Utilities

Water for the North West

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## Glossary

For the glossary, refer to document C003.

# 1. Introduction to the DWMP

The Drainage and Wastewater Management plan (DWMP) is a long-term plan setting out how we intend to maintain robust and resilient drainage and wastewater systems, now and in the future. Whilst long term planning for wastewater has always been undertaken, this is the first time that we are developing a region wide plan in this format, and we have taken a comprehensive approach as we recognise the importance of long-term planning and the increasing need for partnership solutions.

The heart of the plan will be built around collaborative and innovative working, while encompassing all activities relating to drainage, flooding and delivering a wastewater service that protects the environment. We have led on this plan, but have developed it in consultation with our partners as we will be delivering the DWMP in partnership with other organisations such as the Environment Agency and local councils.

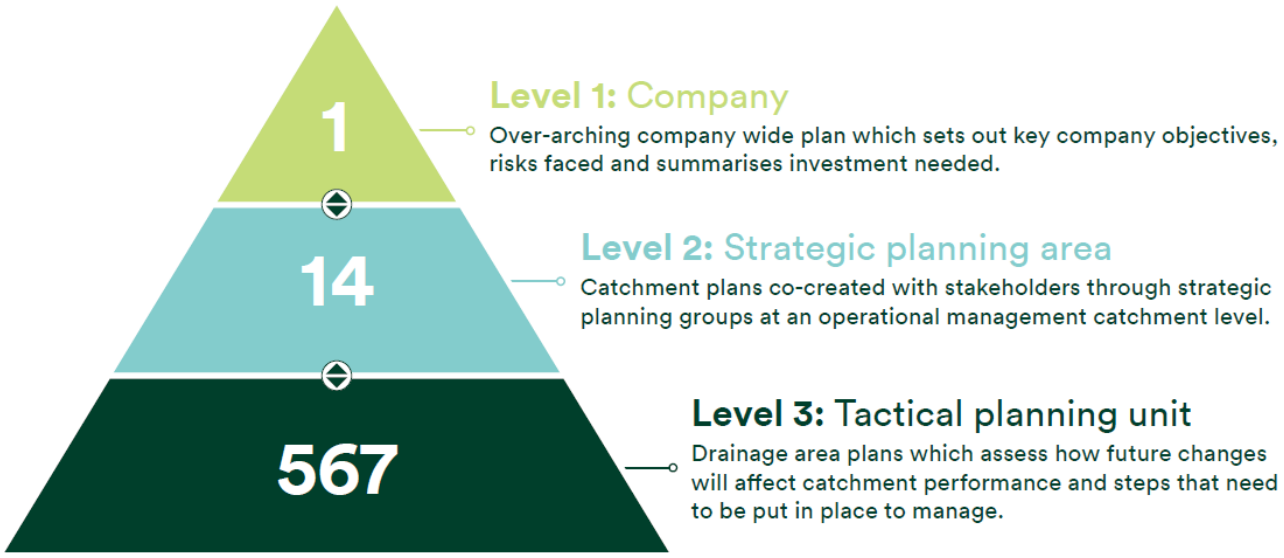
By developing the DWMP, we have an opportunity to:

- Provide a basis for more collaborative and integrated planning alongside stakeholders across the region to tackle shared and interrelated risks relating to drainage, flooding and protecting the environment;
- Strengthen partnership working with all key stakeholders to drive integrated investment in the environment and communities;
- Develop a plan that will help address the increasing environmental expectations from customers and stakeholders and work towards the ambitions set out in Defra's 25-year plan;
- Collectively explore innovative solutions such as Sustainable Drainage Systems (SuDS) and nature-based solutions to understand what is best for the North West; and
- Embed Systems Thinking to better understand drainage and environmental interactions, and to maximise the potential for integrated solutions.

Throughout the DWMP process, we have engaged with stakeholders to share our data and findings, to ensure that the solutions delivered are co-created, drive efficiencies and will benefit the communities and environment that we live and work in.

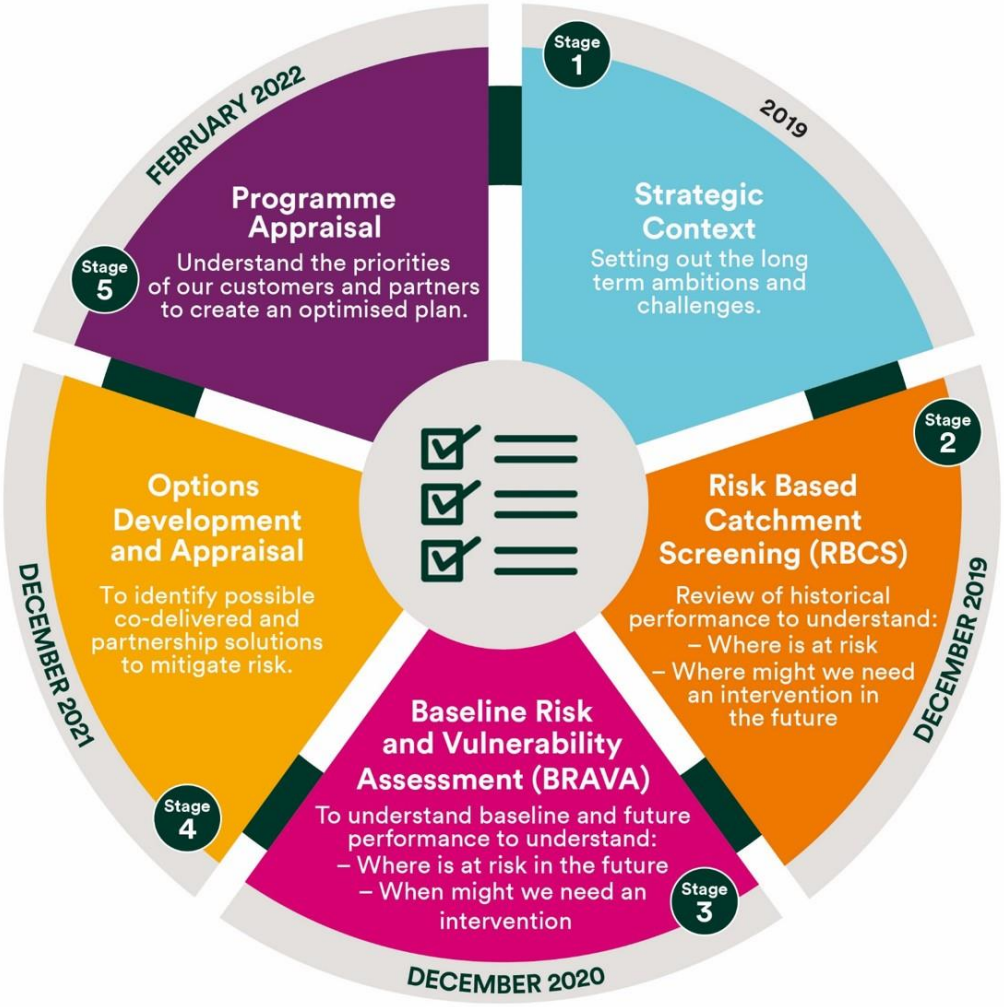
The plan will be set out at three levels (Figure 1) to maximise the potential for partnership working and for effective engagement between regulators and stakeholders at both company-wide level and more locally.

***Figure 1 Geographical scales applied for planning and collaboration within DWMP***



The plan is made up of five main stages (Figure 2), which each contribute to developing the most sustainable and effective future for the North West. These stages include setting out the long-term ambition for the region, identifying risk and understanding the possible interventions and solutions that could be developed.

***Figure 2 Five stages of the DWMP***




**Across the North West, there are 14 Strategic Planning Areas (SPAs) and the purpose of this document is to share local, place-based information.**

**We will share the results from the different stages of the DWMP and how the DWMP plans to make a difference in the Kent Leven SPA.**

# 2. Background to the Kent Leven catchment

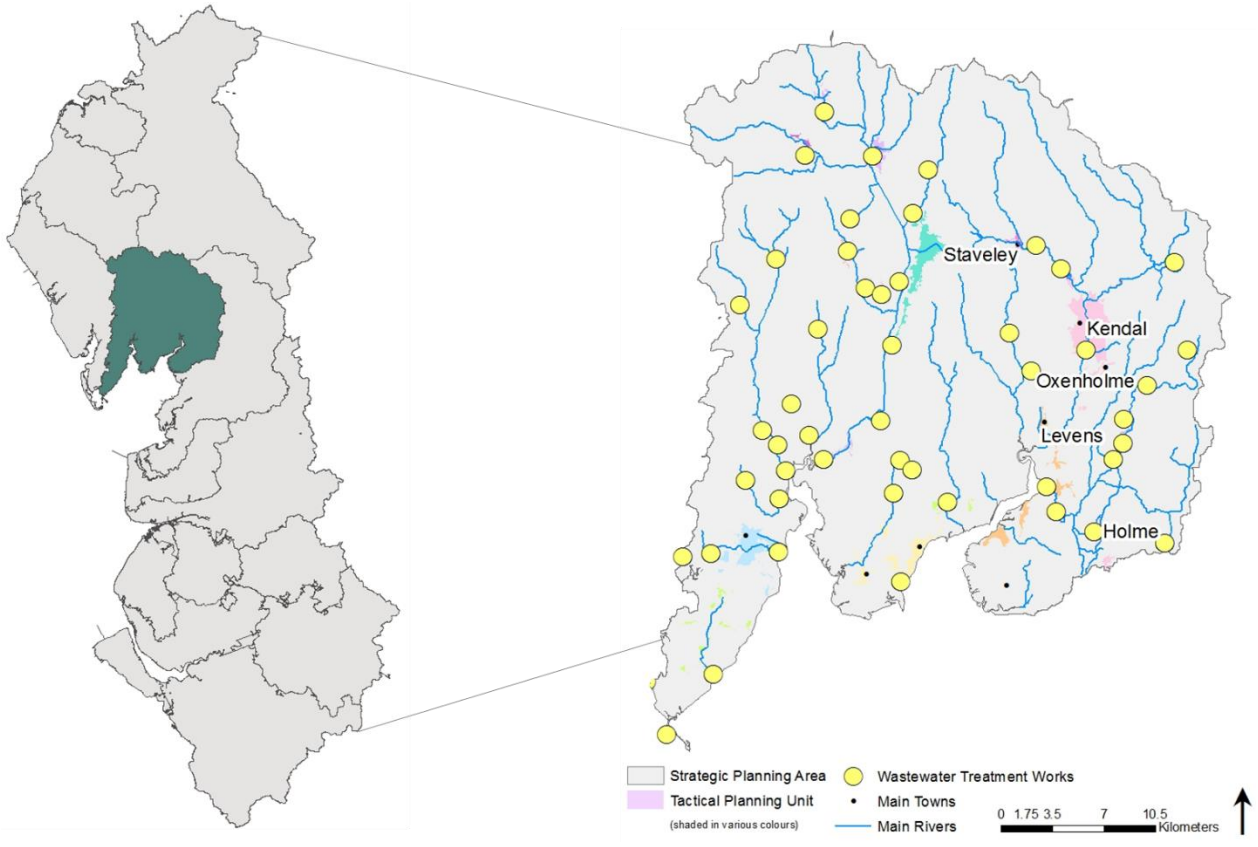
The Kent Leven is a large catchment (1119.7km$^2$) south of the Lake District National Park. It has many areas designated for conservation such as Leighton Moss Site of Special Scientific Interest (SSSI) and it consists of many of the national park's iconic fells and lakes. The land use within the Kent Leven catchment mainly consists of livestock agriculture; there are also areas that are large towns with a significant tourist industry such as Windermere, Ambleside and Kendal [1].

There are four main sub- catchments:

- Bela – The River Bela flows from the south east to the south west of Kendal, starting from the Killington reservoir through the pastureland and enters Morecambe Bay downstream of Milnthorpe [2]. There are no large urban centres in this catchment, instead it is dominated by agriculture.
- Crake – Located in the west area of the catchment, Crake drains the Lakeland Fells above Coniston Water into the Leven Estuary [3].
- Kent – Located along a central band in the catchment area. The River Kent dominates this catchment, flowing through the large town of Kendal and draining into the Kent estuary [4].
- Leven – The largest sub catchment within the Kent Leven catchment area located within the Lake District National Park. This area includes Windermere Lake which drains through the River Leven into Morecambe Bay [5]. The land use is predominantly sheep and beef farming, but large tourist areas such as Bowness-on-Windermere, Ambleside, Hawkshead and Grasmere also are found within this sub catchment [6].

There are 46 wastewater tactical planning units (TPU), also known as wastewater treatment works (WwTW drainage catchments) within the Kent Leven SPA. A TPU is the drainage area including all the sewers and wastewater assets e.g. pumping stations, which drain to the associated wastewater treatment works. The TPUs within the SPA vary in size from larger catchments such as Windermere and Ambleside to smaller, rural catchments such as Spark Bridge. The TPUs are highlighted in Figure 3.

***Figure 3 Map of the Kent Leven SPA***



There are numerous strategic management plans within the Kent Leven that are owned by various other organisations. Within the Kent Leven catchment, there are active management plans such as:

- The Environment Agency River Basin Management Plan (RBMP) and Flood Risk Management Plan (FRMP);
- Lead Local Flood Authority (LLFA) Surface Water Management Plans (SWMP);
- North West and North Wales Coastal Group Shoreline Management Plan (SMP); and
- Local council plans.

Each of these strategic plans focuses on managing particular risks and links to programmes of work. A high-level summary of these management plans is shown in Table 1.

The DWMP aims to collaborate, share best practice and to align with other strategic plans throughout the catchment. This will help to highlight common challenges, ambitions and goals where there are shared or interconnected risks and opportunities.

***Table 1 Summary of stakeholder management plans***

| Management plan | Overview | Key aspects for the Kent Leven catchment |
|---|---|---|
| River Basin Management Plan (RBMP) [7]<br><br>**Owner:** Environment Agency | A river basin district covers an entire river system, including river, lake, groundwater, estuarine and coastal water bodies. The RBMP aim is to improve the quality of our water environment to best support wildlife, agriculture, and businesses, and to boost regeneration and recreation. | The main reasons for not achieving good ecological status are physical modifications and pollution from rural areas and wastewater.<br><br>Future challenges predicted by the Environment Agency include invasive non-native species, physical modifications, changes in natural flow and water levels, and pollution from a range of sources.<br><br>Future challenges predicted by partnerships include pollution from physical modifications, agriculture and rural areas, changes to the natural flow and water levels. |
| Flood Risk Management Plan (FRMP) [8]<br><br>**Owner:** Environment Agency | The FRMP is a strategic plan, which reviews and develops measures to manage the risk of flooding from rivers, the sea, surface water, groundwater and reservoirs. The plan outlines flood risk areas, hazards, and set out measures and objectives to manage flood risk. | The catchment is within the North West River Basin District (RBD). The area covers approximately 13,200km$^2$ and is occupied by close to seven million people. More than 370,000 of these people being at risk from flooding by rivers and the sea with a further 600,000 people at risk of surface water flooding.<br><br>Around 35,000 people are thought to be living in areas that are deemed high risk of flooding from surface water with a further 97,500 at a moderate risk. 31,000 people are living in areas at are high risk of flooding due to rivers and the sea with a further 46,500 at a moderate risk. Areas of significant flood risk across the North West include Ambleside, Ashton under Lyne, Atherton, Blackburn, Burnley, Ellesmere Port, Formby, High Folds, Kendal and Liverpool.<br><br>Ambleside has significant flood risk identified via rivers and the sea. The area has a history of flooding, with the most recent event being a result of Storm Desmond in 2015. Lake Windermere directly flooded the Waterhead and Borrans Road. Around 3,342 people in Ambleside live in areas at risk of flooding with 247 non-residential properties being at risk (e.g. hospitals, schools and public utilities) and 1,400 residential properties also at high risk.<br><br>Kendal has significant flood risk and has had many historical flood events, the most significant occurring in 2015 as a result of Storm Desmond in which the largest flood event was recorded with 2,150 properties being directly affected by flooding. The current flood risk in the area has 5,366 people at risk with 2,236 residential properties.<br><br>The North West has a total of 800km of highly dynamic coastline demonstrated through areas such as Sefton which coastline is eroding by up to 4m per year. |

| Management plan | Overview | Key aspects for the Kent Leven catchment |
|---|---|---|
| Shoreline Management Plan (SMP) [9]<br><br>**Owner:** North West and North Wales Coastal Group | The SMP is a non-statutory, high level policy document for coastal flood and erosion risk management planning that was formally adopted in August 2016. It provides a large-scale assessment of the risks associated with coastal processes and helps to reduce these risks to people and the environment by identifying the most sustainable policies for managing flood and coastal erosion risks in the short term (0–20 years), medium term (20–50 years) and long term (50–100 years). | The long term plan is to continue to protect the settlements of Arnside and Sandside from flooding and erosion and to maintain the integrity of the railway as long as it remains. In order to mitigate the impacts of these defences on the evolution of the estuary, in combination with expected future sea level rise, the long term plan also allows for creation of areas of new habitat and flood storage areas, by moving defences inland where opportunities exist.<br><br>Grange-over-Sands will justify ongoing coastal defence.<br><br>The long term plan is to continue to protect property and infrastructure at Greened, but to also return much of the remaining estuary back to a more natural system.<br><br>Between the Leven estuary and Pile Island the general plan is to allow natural functioning of the shoreline without intervention, although local protection could be justified where the road or property is at risk.<br><br>The long term plan for Wanly Island is to manage flood and erosion risk to residential areas and landfill sites and maintain the overall integrity of the island.<br><br>Havering Dunes on the northern bank and Sandscape Dunes on the southern bank. The plan is to continue to allow these dune systems to evolve naturally, providing important natural defence features. For low lying land around the estuary, the long term plan therefore is to set back defences where opportunities exist, while continuing to protect necessary infrastructure and residential / commercial property in main villages and towns. |
| Surface Water Management Plan (SWMP) [10]<br><br>**Owner:** Lead Local Flood Authority (LLFA) | A SWMP is a plan which outlines the preferred surface water strategy for a location. Although owned and led by the LLFA, a SWMP is produced in collaboration with other drainage owners, water companies included.<br><br>Partners work together to understand the surface water flood risk in an area and agree an approach to address these issues innovatively and in a cost-effective way, and where appropriate, in partnership. A SWMP is a long-term plan and should influence development.<br><br>The decision on whether a SWMP is appropriate is down to the LLFA, generally they are produced for areas considered to experience a high flood risk. UUW continues to work closely with LLFAs and supports the development of SWMPs where required, and the delivery of SWMPs where they are published. | |

| Management plan | Overview | Key aspects for the Kent Leven catchment |
|---|---|---|
| Catchment Based Approach (CaBA) Catchment Plan [7] [11]<br><br>**Owner:** Beck to Bay South Cumbria Catchment Partnership | The aim of the partnership is to bring together stakeholders to create and deliver a focussed, sustainable and collaborative action plan to deliver benefits within the catchment. | The vision of the catchment partnership is to support a healthy, sustainable and diverse catchment system, which provides a wide range of benefits.<br><br>The catchment plan focuses on strategic aims such as:<br><br>• high water quality;<br>• resilience to flood and drought conditions;<br>• sustainable development;<br>• widespread biosecurity and invasive species control; and<br>• diverse habitats that are rich in wildlife.<br><br>Currently, 57% of waterbodies are failing to meet the required status. The main current and future challenges identified by the partnership include physical modifications, changes in natural flow and water levels, and pollution from agriculture and rural areas. |

## 2.1 Strategic Planning Group (SPG)

We appreciate that there are many organisations with formal roles and responsibilities relating to drainage, flooding and protection of the environment. By participating in the creation of a DWMP much more can be achieved compared to working on our plans in isolation.

Within DWMP, SPGs have been a key form of engagement with stakeholders across the region. SPGs have operated at a local, catchment scale to allow stakeholders to input into the identification of priority and shared risk locations and develop an understanding of potential collaborative solutions to tackle shared risks. The SPGs have covered a wide range of issues including reducing flooding and improving water quality. A key driver is understanding where there may be potential to achieve multiple benefit through solutions.

Through the SPGs, we have been able to consult with strategic partners on the various stages of the DWMP (Figure 4) and share outputs as and when they become available. This has been a two-way process and stakeholders have had the opportunity to share information with us such as action plans, confirmed projects, priority areas and ambitions for the future, which could be developed and delivered in partnership. We have been able to review and incorporate the information shared during the different stages of the DWMP process.

Within the Kent Leven, we have engaged with stakeholders such as:

- The Environment Agency;
- Cumbria County Council;
- South Lakeland District Council; and
- South Cumbria Rivers Trust (host of the Kent Leven Catchment Based Approach (CaBA) partnership).

More information on co-creation activity undertaken with the SPG can be found in Technical Appendix 2 – Stakeholder Engagement (TA2). The outputs from this activity in the Kent Leven catchment are outlined in section 4.1.

***Figure 4 DWMP framework for engagement***

# 3. Risk identification

A key component of the DWMP has been around risk identification. This has been a mixture of both historical risk and forecast risk. Activities to understand this were completed through the Risk Based Catchment Screening (RBCS) and Baseline Risk and Vulnerability Assessment (BRAVA) stages. We have also undertaken numerous additional assessments to understand wider resilience and catchment risks.

Further detail on the approaches can be found in Technical Appendix 4 – Risk Based Catchment Screening (TA4) and Technical Appendix 5 – Understanding Future Risk (TA5).

## 3.1 Risk Based Catchment Screening (RBCS) and Horizon Scan

The RBCS stage is a series of high-level assessments that are used to review and screen each TPU to determine whether a more detailed assessment is required during the Baseline Risk and Vulnerability Assessment (BRAVA) stage.

The assessments are designed to span the key aspects of a wastewater company's responsibilities: from the network to the treatment works, to its interaction with the environment. Examples of the assessments considered are internal sewer flooding, storm overflow performance, and pollution incidents. The assessments typically used three to five years of historical data.

Additional assessments termed 'horizon scanning' were undertaken to understand wider exogenous factors and opportunities that could inform future investment e.g. major infrastructure projects, private septic tank locations and potential major infrastructure projects (HS2 etc). Areas with potential future developments were also considered and further information on projected growth areas can be found within the associated Local Plans.

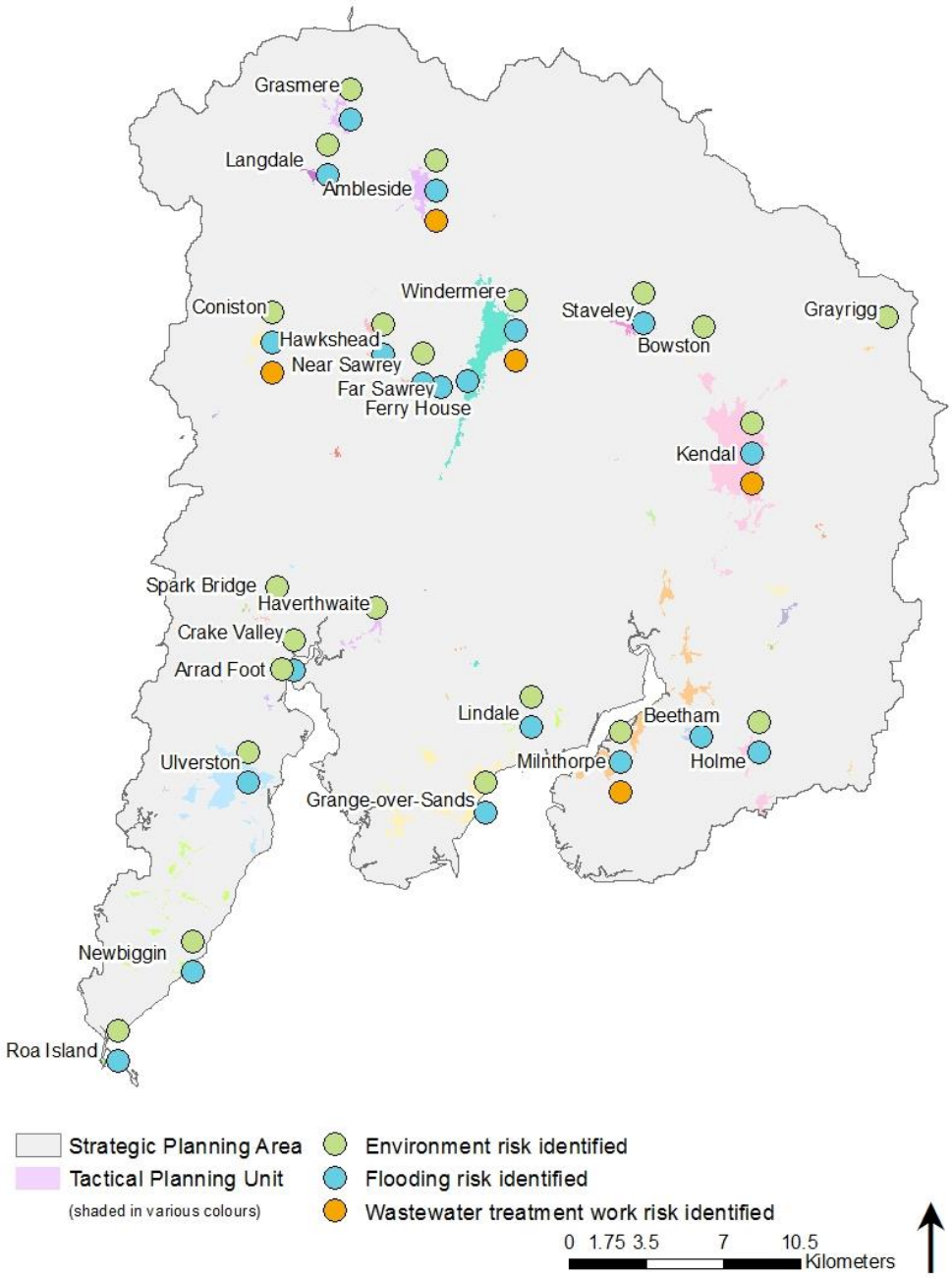
Within the Kent Leven, the RBCS stage identified 27 out of 46 TPUs that required further investigation and therefore passed onto the BRAVA stage (outlined in section 3.2).

Figure 5 indicates which of the RBCS categories (environmental, flooding and wastewater treatment works capacity) have triggered within each TPU. There are numerous TPUs which did not trigger for RBCS across any of the categories and are therefore not shown in Figure 5. A list of these TPUs can be found in Table A.1 in the Appendix. Environmental and flooding categories are the most common within the Kent Leven catchment which is supported by the highest-triggered RBCS assessments which are:

- Storm Overflow Assessment Framework - (22/46) – Environment; and
- External Sewer Flooding - (20/46) – Flooding.

Further detail on the approaches and assessment results can be found in TA4.

***Figure 5 Map of the RBCS results for the Kent Leven. Risk categories indicate areas triggering further investigation following RBCS. TPUs not triggered in RBCS can be found in table A.1 of the appendix***




## 3.2 Baseline Risk and Vulnerability Assessment (BRAVA) and Resilience

The TPUs that were identified during RBCS were then taken forward into BRAVA, which aims to assess the baseline and future position of system performance against the DWMP planning objectives, to understand where there may be issues. It is also to understand wider resilience issues that could also impact upon the DWMP planning objectives. This stage considers risk at 2020, 2030 and 2050 design horizons.

In addition to BRAVA, a range of resilience assessments were undertaken and will have been incorporated throughout the plan to allow us to expand our understanding of wider core risks, such as how the water quality of rivers may change as a result of climate change. We have also assessed risks such as fluvial and/or coastal flooding and fluvial and/or coastal erosion and land stability.

Further detail on the approaches and assessment results can be found in TA5 and Technical Appendix 6 – Resilience (TA6).

The BRAVA and resilience results for the Kent Leven are outlined in Table 2 to Table 5.

***Table 2 Environmental BRAVA results***

| Tactical Planning Unit | Environmental | | | | | |
|---|---|---|---|---|---|---|
| | Pollution Assessment | Storm Overflow Performance | | Bathing and Shellfish Spill Assessment | | |
| | 2020 | 2020 | 2050 | 2020 | 2030 | 2050 |
| Ambleside | | | | | | |
| Arrad Foot | | | | | | |
| Beetham | | | | | | |
| Bowston | | | | | | |
| Coniston | | | | | | |
| Crake Valley | | | | | | |
| Far Sawrey | | | | | | |
| Ferry House | | | | | | |
| Grange-Over-Sands | | | | | | |
| Grasmere | | | | | | |
| Grayrigg | | | | | | |
| Haverthwaite | | | | | | |
| Hawkshead | | | | | | |
| Holme | | | | | | |
| Kendal | | | | | | |
| Langdale | | | | | | |
| Lindale | | | | | | |
| Milnthorpe | | | | | | |
| Near Sawrey | | | | | | |
| Newbiggin | | | | | | |
| Roa Island | | | | | | |
| Satterthwaite | | | | | | |
| Spark Bridge | | | | | | |
| Staveley | | | | | | |
| Torver | | | | | | |
| Ulverston | | | | | | |
| Windermere | | | | | | |

| BRAVA | |
|---|---|
| | No concern (forecast) |
| | Potential area of focus (forecast) |
| | Area of focus (forecast) |
| | Not assessed/not applicable |

***Table 3 Flooding BRAVA results***

**Key**

No concern (forecast)

Potential area of focus (forecast)

Area of focus (forecast)

Not assessed

| Tactical Planning Unit | Flooding | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Internal Flooding Risk | | | External Flooding Risk | | | Sewer Collapse Risk | Risk of Flooding in a Storm (1:50yr) | | Flooding of Open Spaces | | | Blockage Assessment |
| | 2020 | 2030 | 2050 | 2020 | 2030 | 2050 | 2020 | 2020 | 2050 | 2020 | 2030 | 2050 | 2020 |
| Ambleside | | | | | | | | | | | | | |
| Arrad Foot | | | | | | | | | | | | | |
| Beetham | | | | | | | | | | | | | |
| Bowston | | | | | | | | | | | | | |
| Coniston | | | | | | | | | | | | | |
| Crake Valley | | | | | | | | | | | | | |
| Endmoor | | | | | | | | | | | | | |
| Far Sawrey | | | | | | | | | | | | | |
| Ferry House | | | | | | | | | | | | | |
| Grange-Over-Sands | | | | | | | | | | | | | |
| Grasmere | | | | | | | | | | | | | |
| Grayrigg | | | | | | | | | | | | | |
| Haverthwaite | | | | | | | | | | | | | |
| Hawkshead | | | | | | | | | | | | | |
| Holme | | | | | | | | | | | | | |
| Kendal | | | | | | | | | | | | | |
| Langdale | | | | | | | | | | | | | |
| Lindale | | | | | | | | | | | | | |
| Low Park | | | | | | | | | | | | | |
| Milnthorpe | | | | | | | | | | | | | |

| Tactical Planning Unit | Flooding | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Internal Flooding Risk | | | External Flooding Risk | | | Sewer Collapse Risk | Risk of Flooding in a Storm (1:50yr) | | Flooding of Open Spaces | | | Blockage Assessment |
| | 2020 | 2030 | 2050 | 2020 | 2030 | 2050 | 2020 | 2020 | 2050 | 2020 | 2030 | 2050 | 2020 |
| Near Sawrey | | | | | | | | | | | | | |
| Newbiggin | | | | | | | | | | | | | |
| Roa Island | | | | | | | | | | | | | |
| Satterthwaite | | | | | | | | | | | | | |
| Spark Bridge | | | | | | | | | | | | | |
| Staveley | | | | | | | | | | | | | |
| Torver | | | | | | | | | | | | | |
| Ulverston | | | | | | | | | | | | | |
| Windermere | | | | | | | | | | | | | |

***Table 4 Wastewater treatment works BRAVA results***

| Tactical Planning Unit | Wastewater Treatment Works | | |
|---|---|---|---|
| | Risk of Wastewater Treatment Works (WwTW) Capacity | | |
| | 2020 | 2030 | 2050 |
| Ambleside | | | |
| Beetham | | | |
| Coniston | | | |
| Crake Valley | | | |
| Grange-Over-Sands | | | |
| Grasmere | | | |
| Holme | | | |
| Kendal | | | |
| Milnthorpe | | | |
| Near Sawrey | | | |
| Newbiggin | | | |
| Spark Bridge | | | |
| Staveley | | | |
| Ulverston | | | |
| Windermere | | | |

| BRAVA | |
|---|---|
| | No concern (forecast) |
| | Potential area of focus (forecast) |
| | Area of focus (forecast) |
| | Not assessed |

***Table 5 Environmental and flooding resilience results***

| Tactical Planning Unit | Resilience Assessment | | |
|---|---|---|---|
| | Environmental | | Flooding |
| | Potential for changes in the water quality of rivers as a result of climate change | Potential for changes in catchment contributions as a result of climate change | Outfall locking |
| | 2050 | 2050 | 2020 |
| Ambleside | | | |
| Arrad Foot | | | |
| Ayside | | | |
| Beetham | | | |
| Bouth | | | |
| Bowston | | | |
| Brigsteer | | | |
| Broughton Beck | | | |
| Coniston | | | |
| Crake Valley | | | |
| Crooklands | | | |
| Endmoor | | | |
| Far Sawrey | | | |
| Ferry House | | | |
| Field Broughton | | | |
| Grange-Over-Sands | | | |
| Grasmere | | | |
| Grayrigg | | | |
| Hawkshead | | | |
| High Newton | | | |
| Holme | | | |
| Hutton Roof | | | |

| Resilience | |
|---|---|
| | More resilient |
| | Less resilient |
| | Not assessed |

| | Resilience Assessment | | |
|---|---|---|---|
| | Environmental | Flooding | |
| Tactical Planning Unit | Potential for changes in the water quality of rivers as a result of climate change | Potential for changes in catchment contributions as a result of climate change | Outfall locking |
| | 2050 | 2050 | 2020 |
| Kendal | | | |
| Langdale | | | |
| Lindale | | | |
| Loppergarth | | | |
| Low Park | | | |
| Lowick Green No 1 | | | |
| Marton Lane End | | | |
| Near Sawrey | | | |
| Newbiggin | | | |
| Outgate | | | |
| Oxen Park | | | |
| Satterthwaite | | | |
| Spark Bridge | | | |
| St Johns | | | |
| Staveley | | | |
| Staveley-In-Cartmel Tank | | | |
| Torver | | | |
| Troutbeck | | | |
| Underbarrow | | | |
| Windermere | | | |

## 3.3 Problem characterisation

### 3.3.1 Complex catchments

Complex catchments were determined through problem characterisation using a combination of a complex and strategic catchment scores based on strategic need (largely derived from growth and climate forecast models) and modelled risks in each of the TPU (largely based on BRAVA). Within the Kent Leven, the following TPUs were identified to be 'complex' based on problem characterisation:

- Kendal.

### 3.3.2 Strategic growth catchments

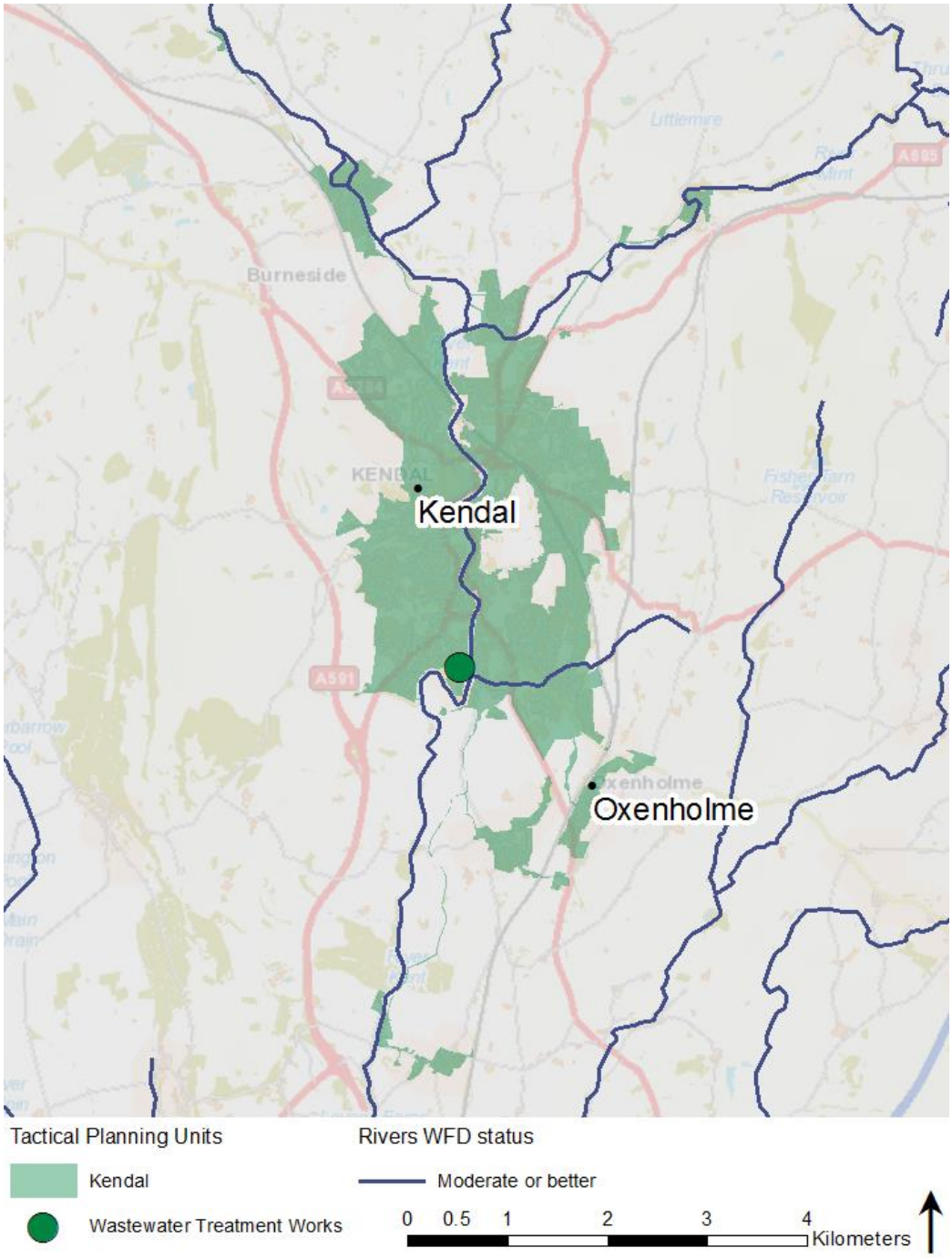
Through the various risk identification assessments, a number of locations were identified through opportunity workshops that require more strategic analysis. These are areas with high growth, a high number of risks and multiple potential scenarios. Different bespoke scenarios are applied to strategic catchments based on the needs and drivers of the catchments to understand the variability of risk as a first step for optioneering, so that the range of options developed can mitigate a different range of scenarios. There are no TPUs within the Kent Leven that were identified as having 'strategic growth'.

### 3.3.3 Kendal

The Kendal TPU is to the south east of the Kent Leven catchment (Figure 6), consisting of over 380km of sewer network which serves approximately 15,600 properties and a residential population of over 32,000 people. The population is projected to grow significantly, with an increase of 14% by 2050, which could drive associated development and increase pressure on our network and assets. The main watercourses are the rivers Kent, Mint and Sprint, which are all classed as 'moderate' under the Water Framework Directive (WFD) 2019.

Kendal is a complex catchment, due to uncertainty associated with forecasts of demographic, economic, and behavioural changes over the planning period. The treatment works was redeveloped during the 2015-2020 funding cycle to incorporate a Nereda process. We are currently monitoring performance and Kendal TPU will be reassessed when there is appropriate base data available. Alongside this the BRAVA process identified risks for internal flooding, external flooding, flooding of open spaces, flooding in a 1-in-50-year storm event, pollution, sewer collapse, and blockages by 2050.

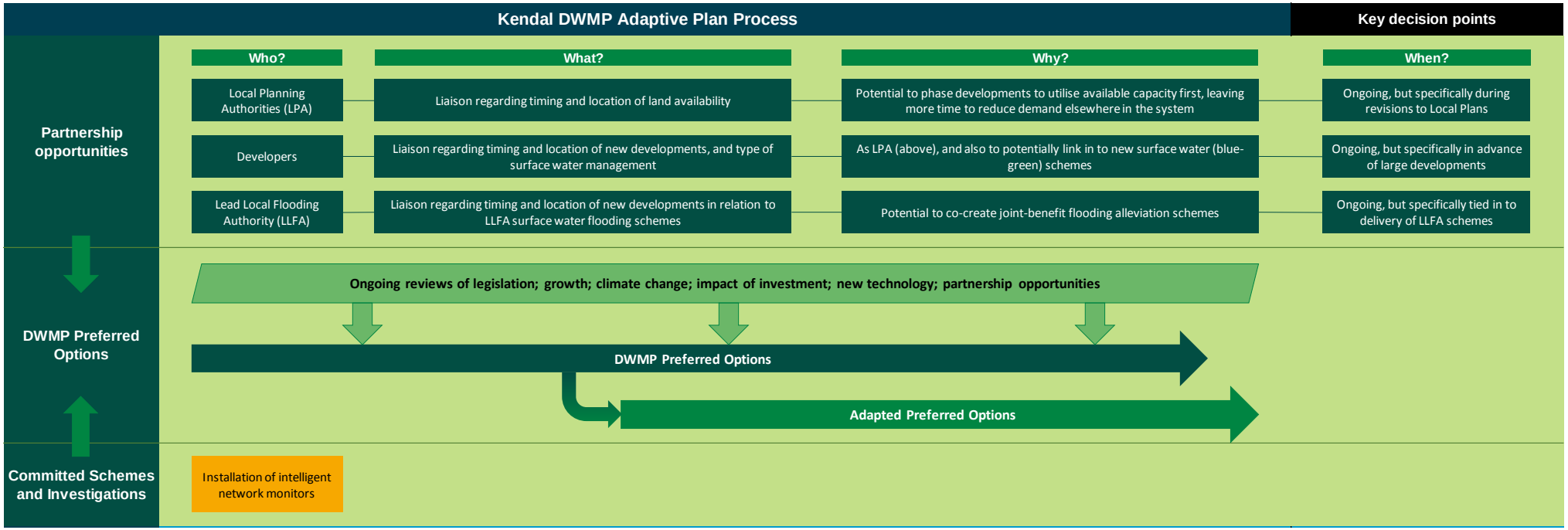
***Figure 6 Map of the Kendal TPU***



#### 3.3.3.1 Kendal adaptive plan

The first part of the adaptive plan process (Figure 7) highlights the importance of partnership working and regular data reviews.

***Figure 7 Kendal adaptive planning process***



In a catchment where growth is a significant factor in future performance, it is key to maintain regular conversations with those stakeholders that have knowledge about future developments and can potentially influence their impact. Key organisations include:

- Local planning authority;
- The Environment Agency;
- Lead local flood authorities; and
- Housing developers.

The DWMP plan for each TPU is developed based on a number of data sources. Some of these are prone to change over time, which means that original assessments can become out of date. As data from these sources change, it makes sense to re-evaluate the DWMP plan to check the impact on the plan. Examples of data that change over time are shown in Table 6.

***Table 6 Examples of data that change over time and can impact upon the plan***

| Type of data or information | Possible impacts of changes |
|---|---|
| **Government legislation** | More or less stringent requirements or regulations, which may require different levels of investment, and policy changes that may drive better or worse incentives on demand. |
| **Development growth projections** | These will vary with time in line with economic conditions, changing demographics, or government policy. This can result in the number of new houses and businesses growing at a different rate than originally forecast. |
| **Climate change projections** | As more climate data becomes available, climate projections are modified, which may indicate changes to temperature and rainfall patterns. |
| **Impact of investment** | As new drainage schemes or new strategies are implemented, we will continue to evaluate their performance. If they turn out to be more or less successful than anticipated, this may allow the extent of another option type to be reduced or increased accordingly. |
| **Development of new technology** | Over time, new technology provides opportunities to address and resolve risks differently, or more efficiently. |
| **Partnership opportunities** | We will work closely with key stakeholders to address risks jointly. Over time, these stakeholders may see changes in their own risks and funding levels, which may present opportunities for greater collaboration. |

Figure 8 shows the second part of the Kendal adaptive plan, reflecting the different option types identified as being appropriate for Kendal. Each line represents a different option type – e.g. schools education programme. The plan shows that each option type will be regularly reviewed in line with the method described in part one. This allows new information and opportunities to be used to adapt the plan by either increasing or reducing the extent of some option types.

Within Kendal, there are opportunities to carry out investigations before making final decisions on the final strategy. This means that we can properly evaluate options before committing to significant investment. These investigations will take into account things such as:

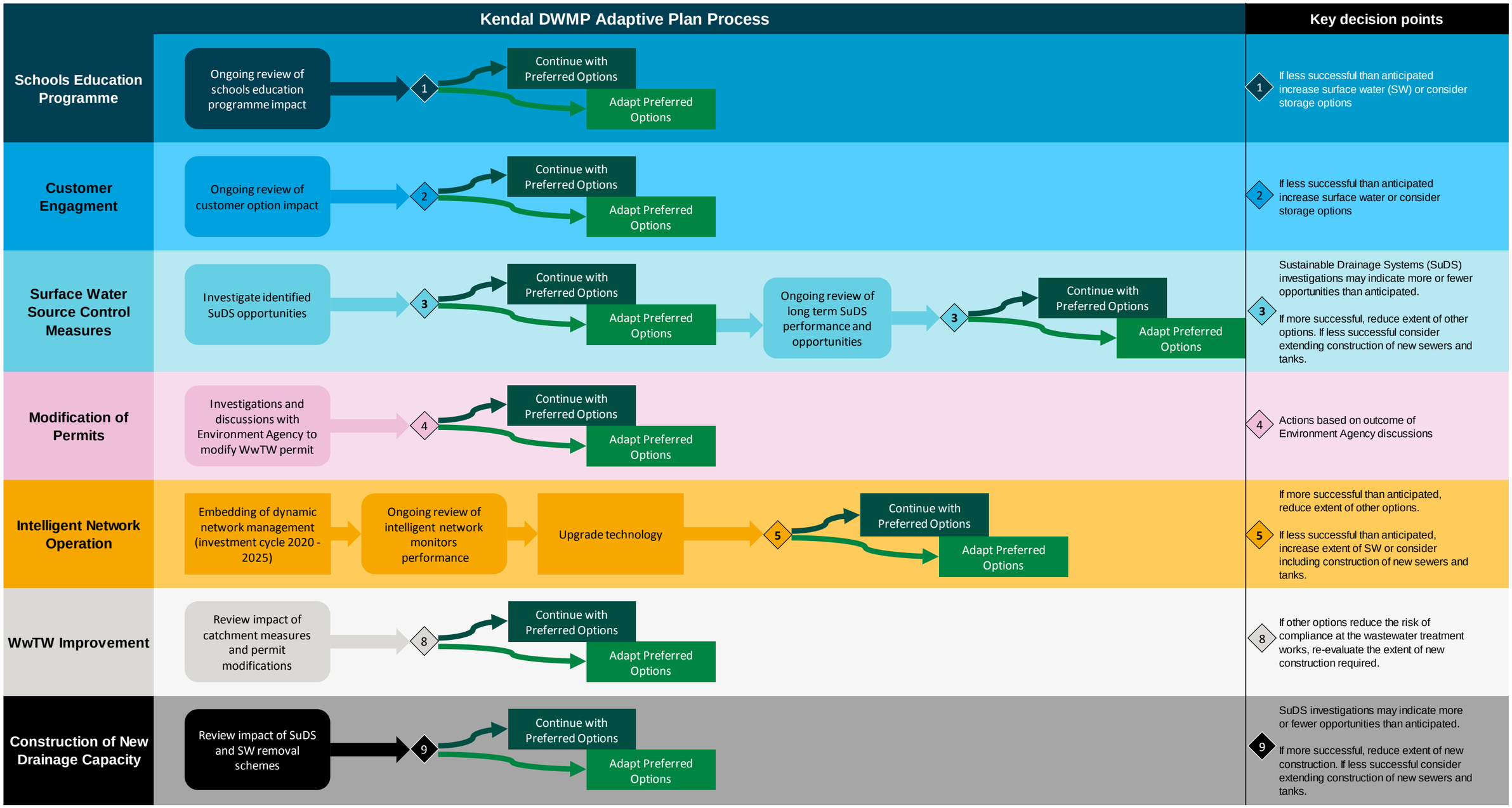
- Technical feasibility;
- Benefit of the work;
- Customer impact;

- Environmental impact; and
- Cost.

The adaptive plan below demonstrates multiple potential scenarios and pathways and should be read in conjunction with the optimised DWMP plan for the relevant TPU (refer to section 5.2).

The adaptive plan should be reviewed regularly in order to incorporate potential changes in key factors such as legislation, population growth and climate change, which could impact standards or targets, as highlighted in Figure 8. The adaptive plan may contain potential investigations, which are currently excluded from the optimised DWMP plan (refer to section 5.2) until there is more certainty. It is, therefore, important that both the adaptive plan and the optimised plan are developed together.

***Figure 8 Kendal Adaptive Plan – Possible adaptive pathways as knowledge and opportunities change over time***



# 4. Options development

The approach for options development is an iterative screening process to identify most appropriate solutions for issues in each TPU. These solutions were taken forward for a best value assessment, which will select the preferred option (Figure 9). An options hierarchy was then used, which has been endorsed by customers and stakeholders from across the North West to select preferred solutions (Figure 10). The hierarchy covers a range of option types from behavioural, to blue-green solutions e.g. SuDS and traditional grey solutions e.g. storage tanks across benefits such as reducing demand, better system management and creating capacity.

A key element to this has been built around co-development, co-funding and co-delivery through partnerships and third parties (for instances where a specific skill set is required).

*Figure 9 Options development process*

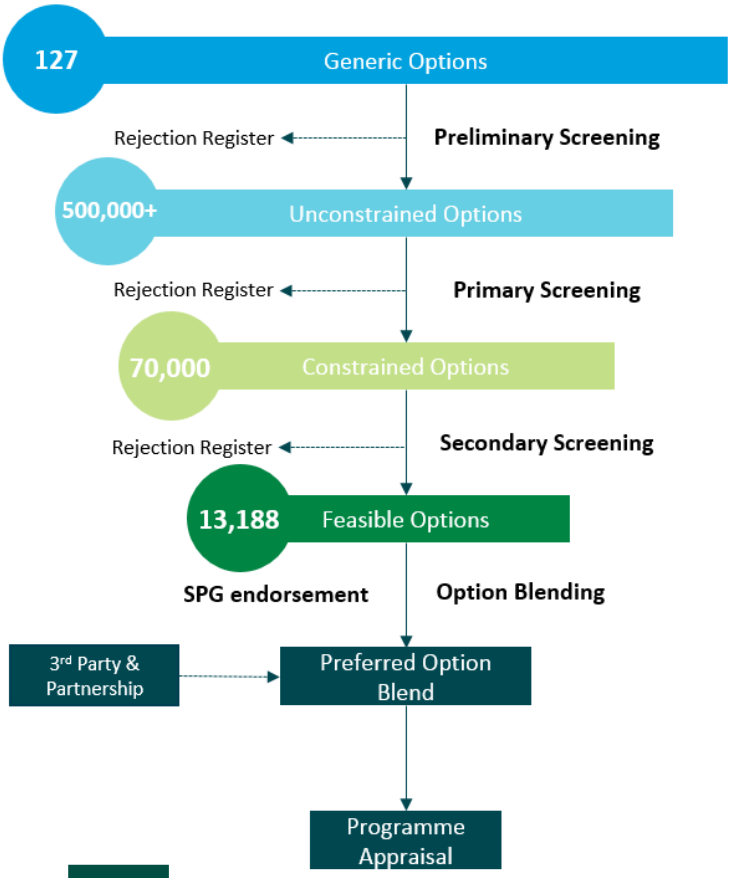



*Figure 10 Options hierarchy*

## 4.1 Kent Leven partnerships options

In order to identify and develop potential partnership options in the Kent Leven, through the SPG we have shared the results from the risk identification stages such as BRAVA. This was done through a series of workshops and the purpose was to identify areas of shared risk and partnership opportunities.

The DWMP Partnership Opportunities Pipeline (PoP) was consequently created using the outputs of this engagement. The pipeline includes opportunities at a range of different levels of maturity and confidence in development, as such these are not confirmed or funded schemes at this time. However, they provide an indication of areas where we may be able to work collaboratively with stakeholders in the future when more certainty is available on need and funding.

From the initial suggestions made during the SPG workshops, the DWMP PoP has undergone various refinements as summarised below:

- Where possible, the potential partnership opportunities were mapped and this created over 1,000 opportunities for further investigation. The suggestions were screened depending on the opportunities timescales, proximity to UUW assets and the level of detail. This allowed UUW to refine the opportunities, which were believed to have the most potential;
- This refined list was presented back to the SPGs for updates, review and discussion. This further discussion allowed additional benefits to be identified and better mapping. This was particularly important for potential integrated drainage partnership opportunities as it helps to understand the holistic picture of the flooding mechanism. This refined the list further to approximately 500 potential partnership opportunities;
- Following the SPG events, we mapped the updated DWMP partnership opportunities against asset locations and UUW areas of interest e.g. flooding clusters and mutual natural flood management, to identify those most suited to the DWMP. This produced the list of key DWMP partnership opportunities; and
- The key list of opportunities have been reviewed against the wider DWMP options development process.

The remaining opportunities that did not make it into the key DWMP PoP, for example in areas with no wastewater assets, were captured in our organisation-wide partnership opportunity pipeline where they are considered alongside all other partnership opportunities. Another key reasons for opportunities not being included in the DWMP PoP is where projects may be more imminent as the DWMP is a longer-term plan.

Examples of potential partnership opportunities that were shared during the Kent Leven SPG workshops are shown in Figure 11 and Table 7.

We are further developing the organisation-wide partnership opportunity pipeline and are developing a central partnership prioritisation process which comprises of two elements; the partnership solution identification stage and a specific partnership assessment activity which aims to support decision making for partnership schemes against a set of specific criteria. This will allow UUW to harness scheme specific collaboration opportunities as we recognise the need for more strategic partnerships, and we will build on successes from historic partnerships in the North West.

For further information on our approach to partnership working, refer to TA2.

***Figure 11 Overview of partnership opportunities in the Kent Leven***

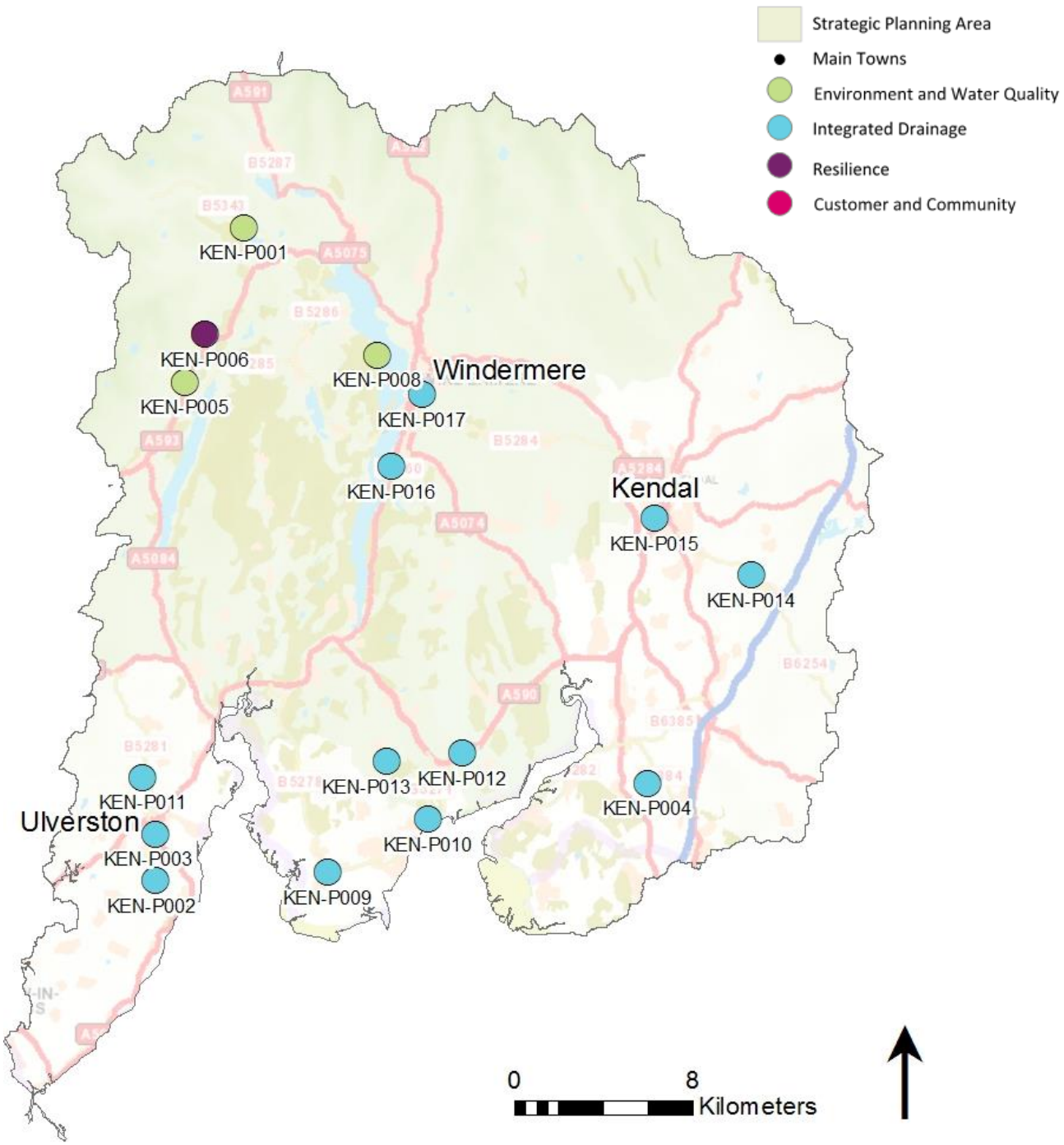


*Table 7 Partnership opportunities in the Kent Leven*

| ID | Partnership Opportunity | Theme | Organisation Type |
|---|---|---|---|
| KEN-P001 | River restoration project | Environment and Water Quality | Public Bodies |
| KEN-P002 | Highway drainage improvements project | Integrated Drainage | Undisclosed |
| KEN-P003 | Flood risk management opportunities project | Integrated Drainage | Public Bodies |
| KEN-P004 | Flood risk management project | Integrated Drainage | Local Councils and Planning Authorities |
| KEN-P005 | River restoration project | Environment and Water Quality | Non-Governmental Organisations |
| KEN-P006 | Natural flood management opportunities project | Resilience | Public Bodies |
| KEN-P007 | Natural flood management opportunities project | Resilience | Undisclosed |
| KEN-P008 | Reed bed creation and restoration project | Environment and Water Quality | Undisclosed |
| KEN-P009 | Highway drainage improvements project | Integrated Drainage | Local Councils and Planning Authorities |
| KEN-P010 | Surface water flood management project | Integrated Drainage | Local Councils and Planning Authorities |
| KEN-P011 | Surface water flood management project | Integrated Drainage | Local Councils and Planning Authorities |
| KEN-P012 | Surface water flood management project | Integrated Drainage | Local Councils and Planning Authorities |
| KEN-P013 | Surface water flood management project | Integrated Drainage | Local Councils and Planning Authorities |
| KEN-P014 | Surface water flood management project | Integrated Drainage | Local Councils and Planning Authorities |
| KEN-P015 | Surface water flood management project | Integrated Drainage | Local Councils and Planning Authorities |
| KEN-P016 | Surface water flood management project | Integrated Drainage | Local Councils and Planning Authorities |
| KEN-P017 | Surface water flood management project | Integrated Drainage | Local Councils and Planning Authorities |

**Note:** The above are suggestions made by stakeholders but not all of them meet DWMP criteria for potential partnership working. Suggestions made that do not meet DWMP criteria have been added to UUW companywide partnership pipeline for further consideration.

# 5. Options for the Kent Leven

The DWMP's purpose is to provide a long-term view of potential interventions and opportunities up to 2050. We acknowledge that planning this far in the future can be uncertain. This is why it is important that the DWMP is also aligned with nearer term activities which could influence and change the trajectory of future risks and opportunities.

The success of the DWMP through investment across the North West will depend on continued and new partnership working which is at the heart of both the DWMP, and the development of the business plan for investment cycle 2025 – 2030 (also known as AMP8). We are aligned to ensure that decisions made support the continued growth of the North West for customers and communities, and allow the environment to thrive for future generations.

This section provides a high level overview of the potential benefits and investment that can be delivered across the North West through key activities such as the Water Industry National Environment Programme (WINEP) for investment cycle 2025 – 2030, longer-term measures identified through the DWMP, and other projects such as Better Rivers: Better North West which is our commitment to improving river health.

## 5.1 WINEP development

**Note:** At the time of DWMP publication, the WINEP was not confirmed by regulators so is likely to change. The WINEP data presented below aligns to the formal submission from UUW in January 2023.

The WINEP is a programme of works that is jointly developed between water companies and regulators to meet statutory requirements and deliver environmental improvements to customers and communities. It sets out how the water industry will contribute to improving the natural environment.

The water industry has undertaken significant investment in the last three decades to improve the water environment and thus aquatic life. The WINEP drives the largest investment programme in the water environment nationally. For investment cycle 2020 to 2025, it includes activities such as asset improvements, investigations, monitoring and catchment interventions.

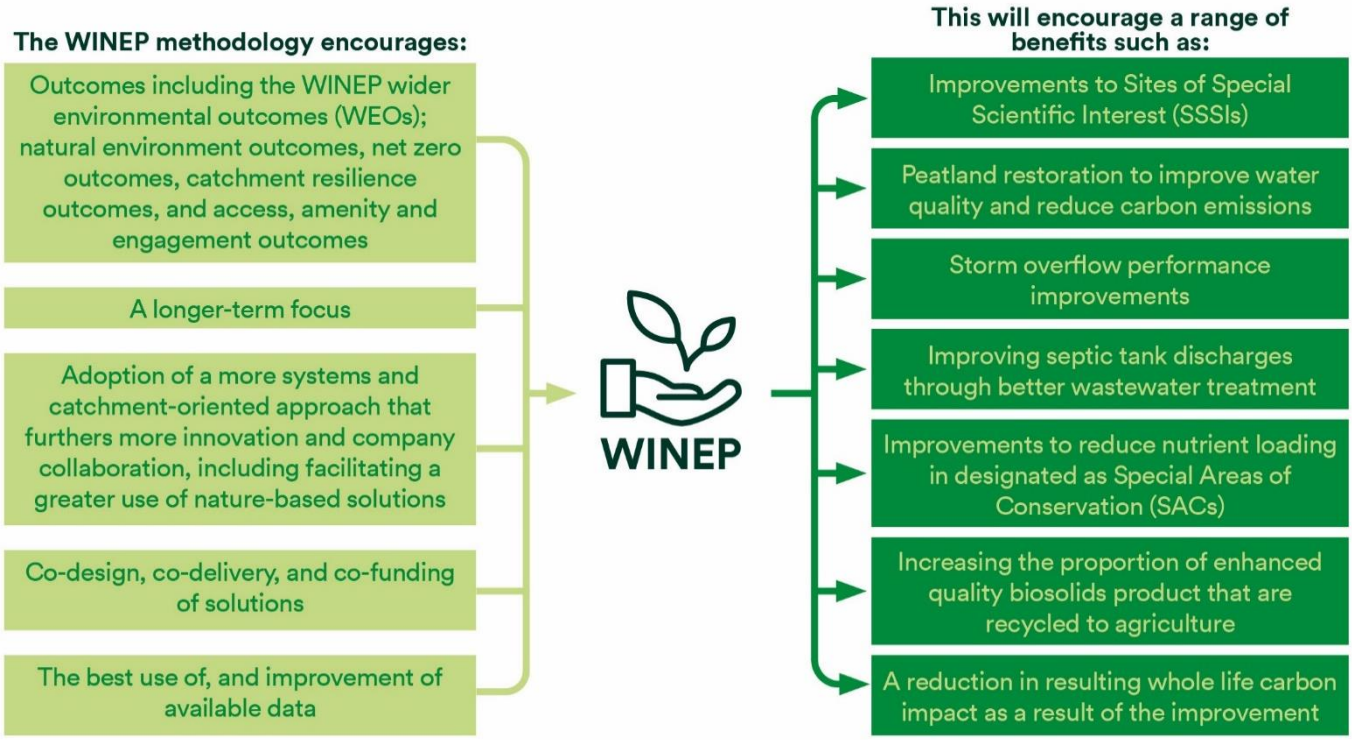
The next WINEP for investment cycle 2025 – 2030 (AMP8) is still to be confirmed (after the publication of the DWMP) and you will be able to find out more about what this means for the Kent Leven when we publish our AMP8 submission in autumn 2023.

Moving forwards, there is a collective ambition for the WINEP to deliver even more for the environment, for customers and for communities. This reflects society's high expectations and the UK government's ambition to leave the environment in a better state for the next generation.

As part of this, a large portion of the WINEP for the next investment cycle (2025 – 2030) aims to improve storm overflow performance. The programme has been designed to meet the Government's Storm Overflow Discharge Reduction Plan (SODRP) trajectory targets, address proven harm where we have been able to identify the best value solution and then the remainder includes action at the most cost effective overflows to achieve a reduction in spill frequency to around 20 spills per annum average by 2030. Subsequent investment periods will see further reductions in line with the Government requirements. The scale of transition required to meet the SODRP targets means that UUW will be delivering substantial WINEP investment programmes for the next 25 years.

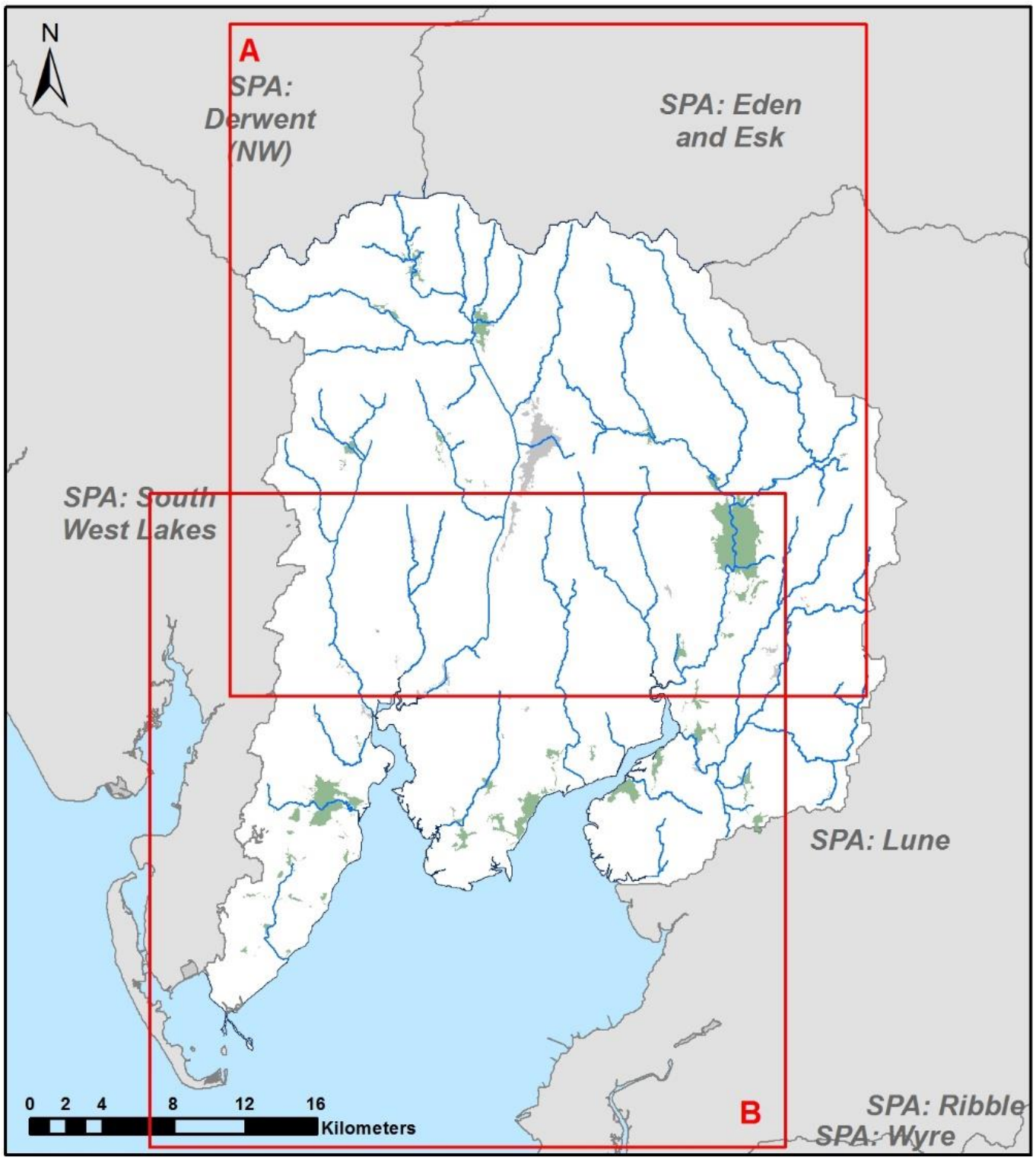
Figure 12 highlights some of the potential benefits as a result of the WINEP.

*Figure 12 Potential benefits to the North West as a result of the WINEP*




The WINEP will provide great opportunities to drive and deliver benefits across the North West region, and Figure 13 shows which locations within the Kent Leven have the potential for investment cycle 2025 – 2030 WINEP schemes, based on the January 2023 WINEP submission.

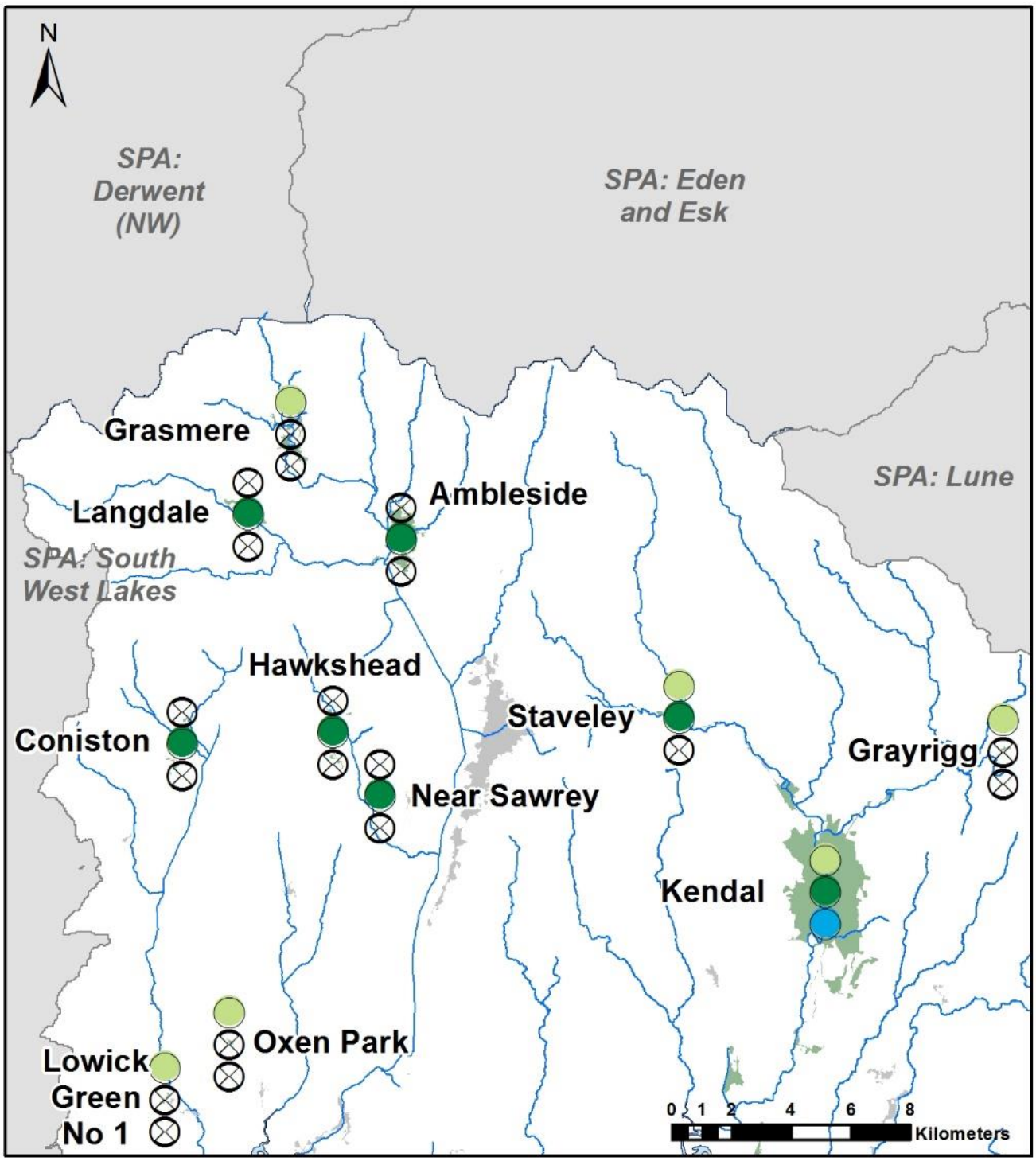
*Figure 13 Potential WINEP investment in the Kent Leven for investment cycle 2025-2030*




All potential WINEP interventions are subject to a regulatory decision making process that is ongoing at time of DWMP publication.

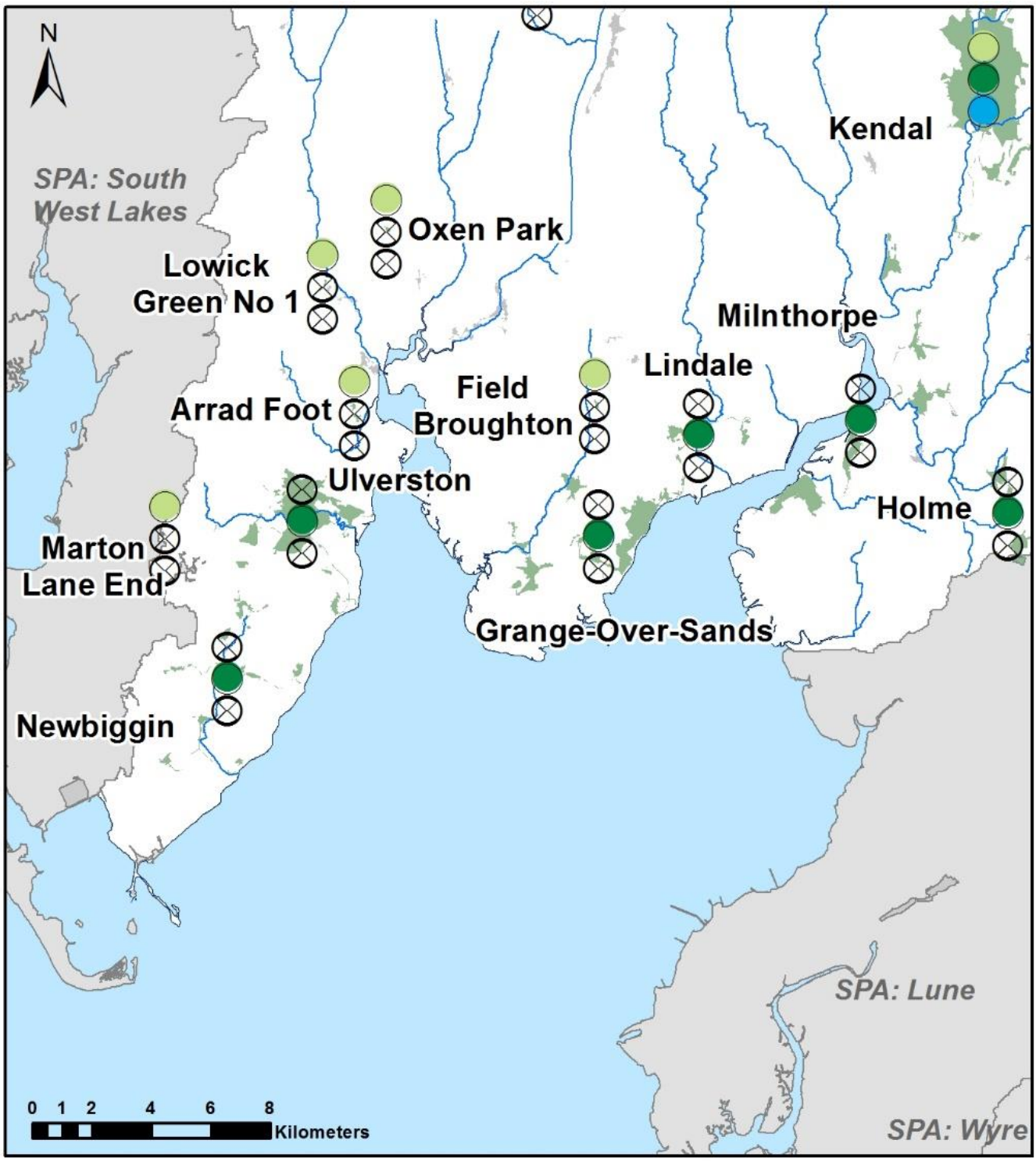
The inset box references in Figure 13 above refer to Figure 14 and Figure 15 on the following pages.

*Figure 14 Potential WINEP investment in the Kent Leven for investment cycle 2025-2030*




All potential WINEP interventions are subject to a regulatory decision making process that is ongoing at time of DWMP publication.

*Figure 15 Potential WINEP investment in the Kent Leven for investment cycle 2025-2030*




All potential WINEP interventions are subject to a regulatory decision making process that is ongoing at time of DWMP publication.

## 5.2 Options considered within the DWMP

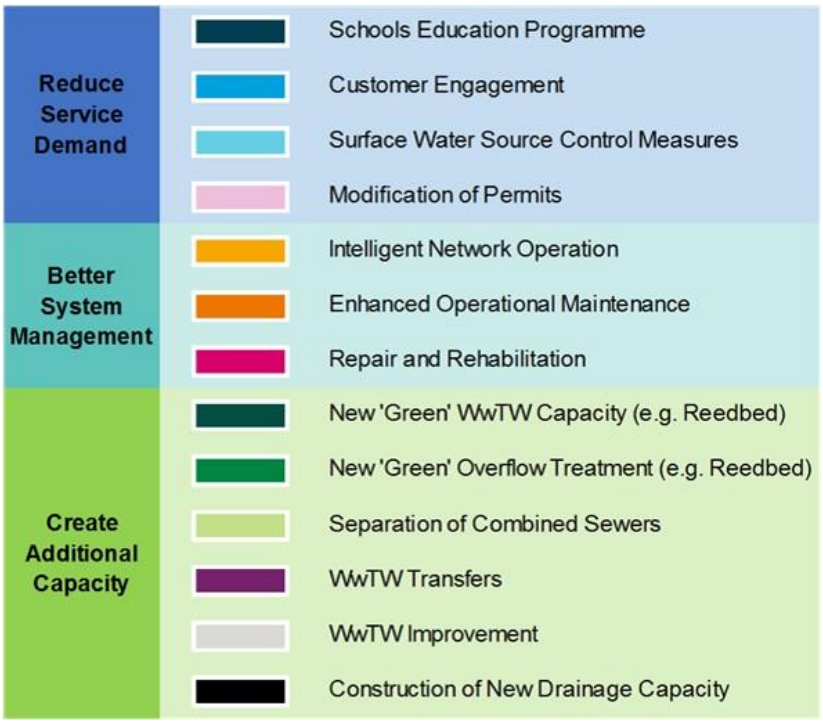
As highlighted above, the delivery of the WINEP will drive improvements and deliver benefits across the North West in the nearer-term. The DWMP is closely aligned with the ambitions and targets included within the WINEP, and included below are potential further enhancement schemes to be delivered over the next 25-years as part of the DWMP.

The development of the DWMP has utilised various data sources across the different stages of the plan, such as risk identification and BRAVA, partnership opportunities, and option development. This has allowed us to understand what options and interventions could be introduced to mitigate shared risks and harness opportunities for collaboration. This aspect of the DWMP is known as preferred options and has been developed using a decision support tool and by following the option hierarchy. The preferred options are high-level potential interventions up to 2050.

The development of the DWMP preferred options followed an iterative screening processes (outlined in section 4) which have been grouped into option types as shown in Figure 16. There are three main categories which are:

- 'Reducing Service Demand' which focusses on either reducing the amount of wastewater that is produced, or preventing it from reaching the sewer network;
- 'Better System Management' which focusses on managing and operating the existing assets in a more efficient or effective manner; and
- 'Create Additional Capacity' which focusses on building new assets, for example storage tanks or new treatment work process units, where it is not possible or economical to reduce demand or improve operations any further.

***Figure 16 Option types***




Potential opportunities for investment as part of the DWMP can be summarised as:

- Level 1: Regional measures (section 5.2.1);
- Level 2: Options for the Kent Leven (section 5.2.2); and
- Level 3: Options for each location within the Kent Leven (section 5.2.3).

Across these three levels, there are numerous opportunities over the next 25 years for continued and new partnerships in addition to new innovative technology.

The following sections provides an overview of the outputs from the DWMP. This includes all potential interventions that could be undertaken over the next 25-years to deliver benefit to the North West under the assumption of unconstrained funding. Therefore, it is likely that the interventions implemented will vary.

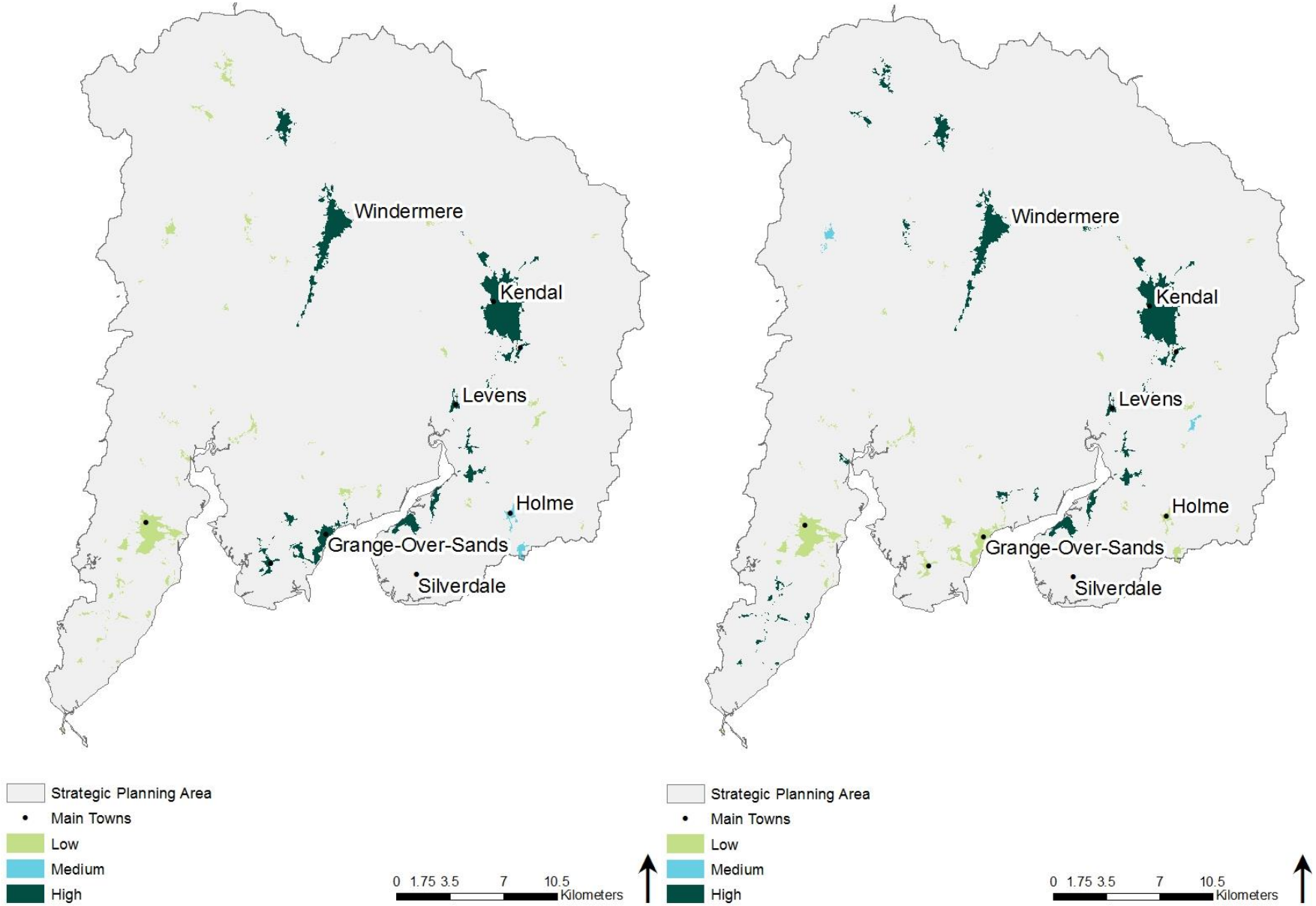
### 5.2.1 Level 1: Regional measures

Across the option types, a number can be considered regional options – those which could be implemented across the North West but may bring tangible benefits in some areas more than others. These can be investigated further ahead of investment cycle 2025–2030 where viable.

Across the Kent Leven catchment, customer engagement options (Figure 17), comprising of options to work with customers to reduce demand and increase awareness of 'what not to flush', have been identified as having the potential to deliver the highest benefit in Ambleside, Windermere and Kendal TPUs.

Additionally, Sustainable Drainage System (SuDS) options have been assessed, these form a key part of the strategy to manage rainwater from entering the sewer system in Windermere, Hawkshead and Ambleside TPUs (Figure 17).

***Figure 17 Maps showing the benefit of implementing regional customer engagement (left) and sustainable drainage solutions (right) options across the Kent Leven***



### 5.2.2 Level 2: Options for the Kent Leven

The DWMP preferred options can also be summarised as the potential investment and associated benefits across the Kent Leven. These can be demonstrated by:

- The potential options to address environmental planning objectives as shown in Figure 18. This incorporates elements such as wastewater treatment work permit compliance, WINEP compliance and pollution of watercourses;
- The potential options to address flooding planning objectives as shown in Figure 19. This incorporates elements such as internal flooding, external flooding, highway and open space flooding and 1 in 50-year flooding; and
- The distribution of the potential options that could contribute to addressing the above planning objectives as shown in Figure 20.

***Figure 18 Distribution of environmental investment by option type within the Kent Leven***

This is an example of how investment in different options types may be used to address the environmental planning objectives. The vast majority of potential investment could be through surface water source control measures (e.g. SUDS), improvements in wastewater treatment works, and construction of new drainage capacity.

| | |
|---|---|
| **Reduce Service Demand** | Schools Education Programme |
| | Customer Engagement |
| | Surface Water Source Control Measures |
| | Modification of Permits |
| **Better System Management** | Intelligent Network Operation |
| | Enhanced Operational Maintenance |
| | Repair and Rehabilitation |
| **Create Additional Capacity** | New 'Green' WwTW Capacity (e.g. Reedbed) |
| | New 'Green' Overflow Treatment (e.g. Reedbed) |
| | Separation of Combined Sewers |
| | WwTW Transfers |
| | WwTW Improvement |
| | Construction of New Drainage Capacity |

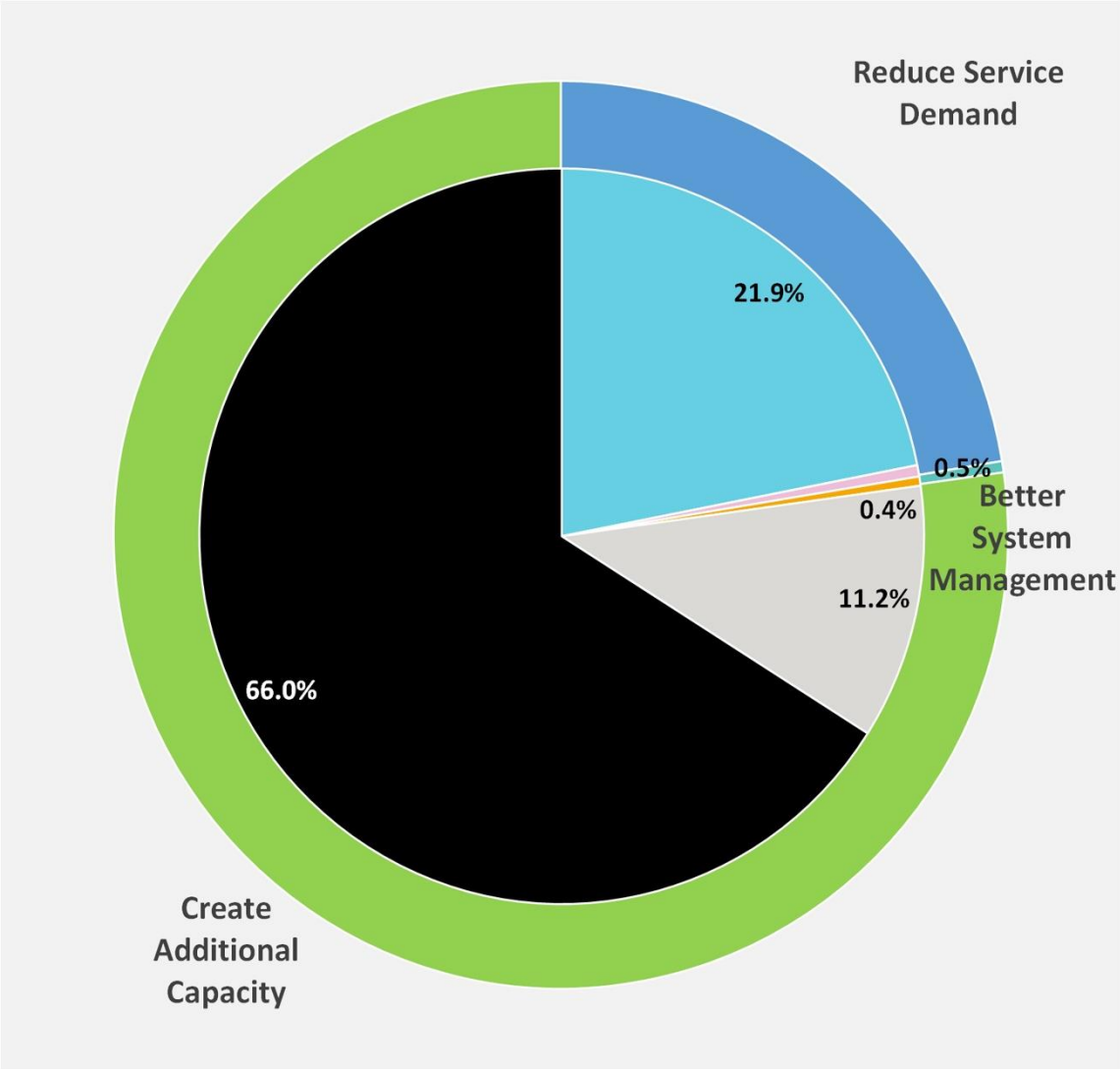


***Figure 19 Distribution of flooding investment by option type within the Kent Leven***

This is an example of how different options types may be used to address flooding planning objectives. Around two thirds of the investment could be through construction of new drainage capacity.

The remainder could be through investment in surface water source control measures (e.g. SUDS), customer engagement, and improving existing system management systems.

| | |
|---|---|
| **Reduce Service Demand** | Schools Education Programme |
| | Customer Engagement |
| | Surface Water Source Control Measures |
| | Modification of Permits |
| **Better System Management** | Intelligent Network Operation |
| | Enhanced Operational Maintenance |
| | Repair and Rehabilitation |
| **Create Additional Capacity** | New 'Green' WwTW Capacity (e.g. Reedbed) |
| | New 'Green' Overflow Treatment (e.g. Reedbed) |
| | Separation of Combined Sewers |
| | WwTW Transfers |
| | WwTW Improvement |
| | Construction of New Drainage Capacity |

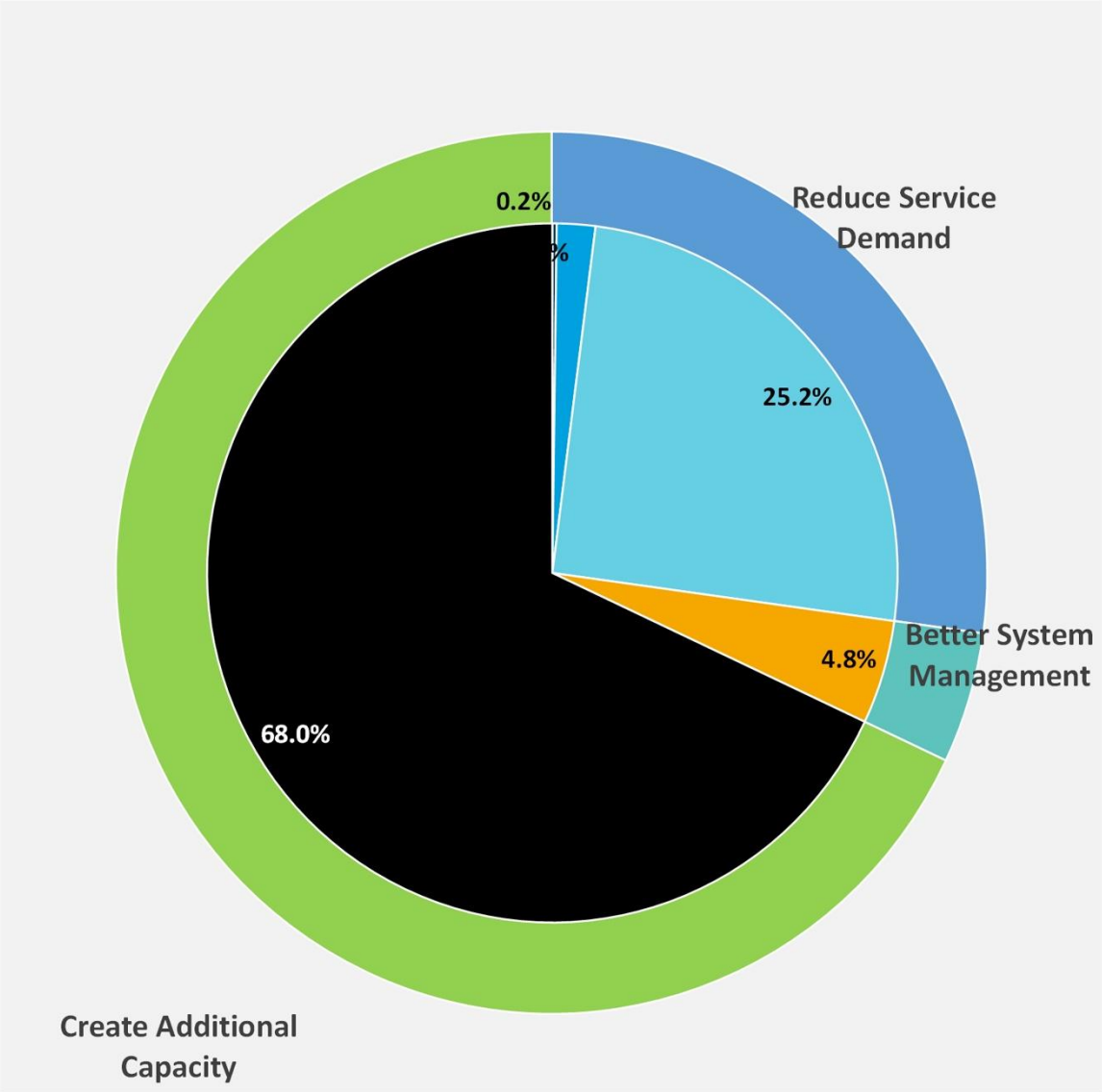
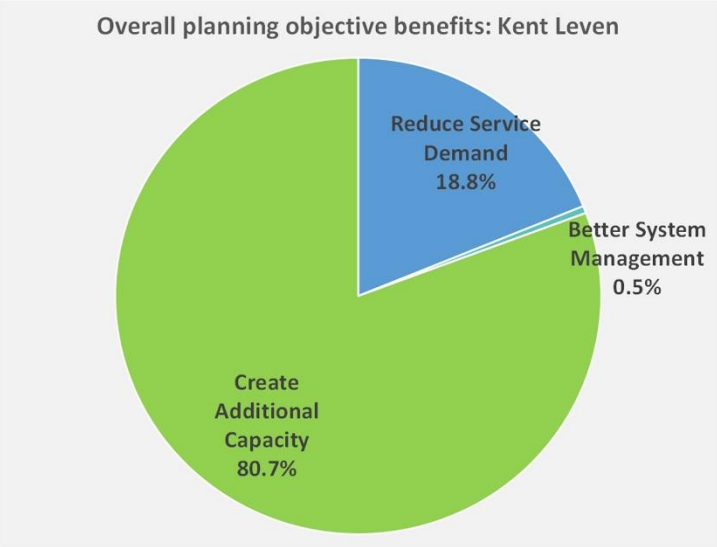


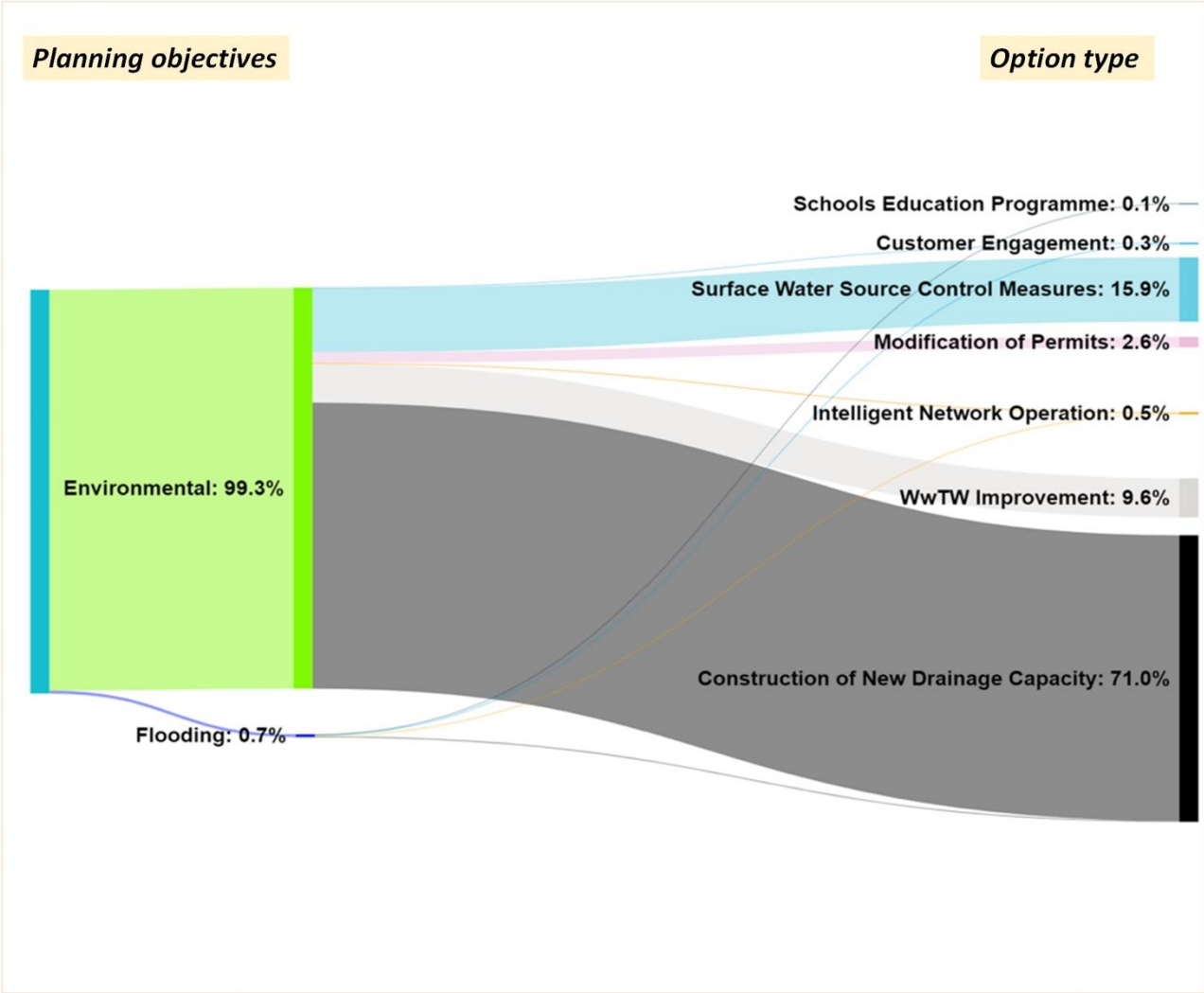
***Figure 20 Distribution of benefit by option type within the Kent Leven***

This is an example of how different option types may be used to demonstrate potential benefits against different planning objectives within the Kent Leven SPA.

United Utilities Water (UUW) commitments to improving flooding performance will be met through the reduction of surface water flows, schools and customer engagement programmes, improved operational maintenance systems, and the construction of new stormwater drainage capacity.

Environmental planning objectives will be met mainly through improvements to wastewater treatment works, including modification of permits, improved operational maintenance systems, and provision of stormwater storage capacity.



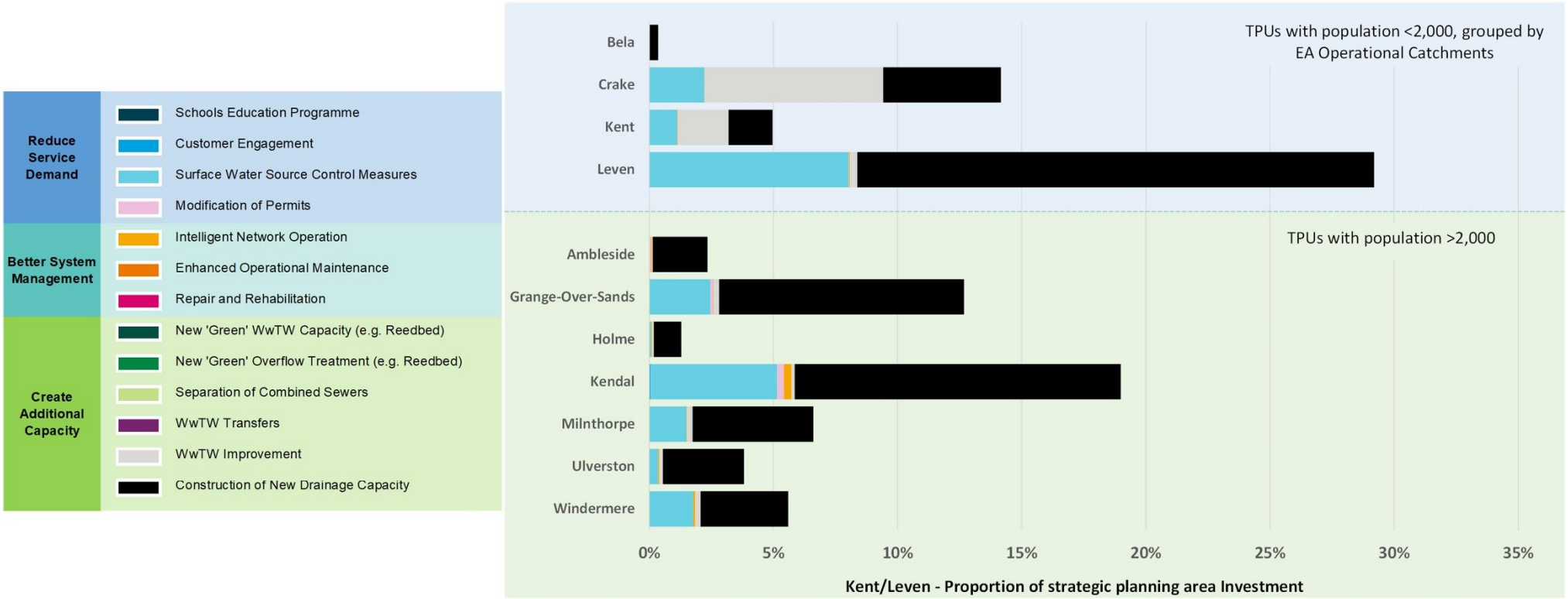



### 5.2.3 Level 3: Local options for each TPU within the Kent Leven

The proportion of the Kent Leven's potential investment in each TPU, split up by option type, is shown in Figure 21. Note that the smaller TPUs within the catchment (those with less than 2,000 population) have been reported together at the top of the chart, grouped by sub catchment (Environment Agency Operational Catchment boundaries).

It can be seen that in the Kent Leven, the largest TPUs see the largest potential investment, which is split predominantly between surface water control, wastewater treatment works improvements, and construction of new storm water storage tanks.

***Figure 21 Proportion of investment seen in each TPU within the Kent Leven***




The following sub-sections show how investment could be split between different types of options to bring benefits to each TPU over the short, medium and long term. Some options, such as construction of new storm water storage tanks, occur at a single point in time; however, the benefit of reduced flooding will be seen long into the future. Other options such as school education, are continual programmes that will help to encourage long-term sustainable behaviours, such as reduction in water use.

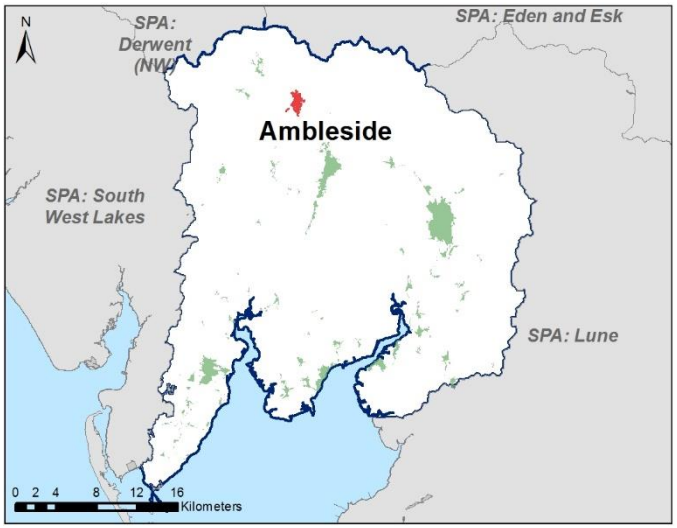
### 5.2.3.1 Ambleside

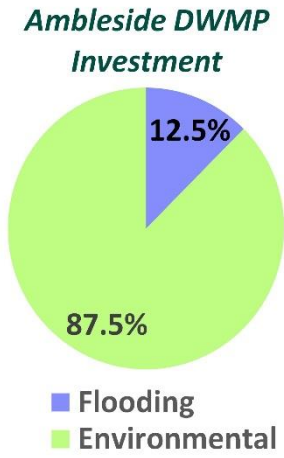
***Figure 22 Details of the DWMP investment plan for Ambleside***

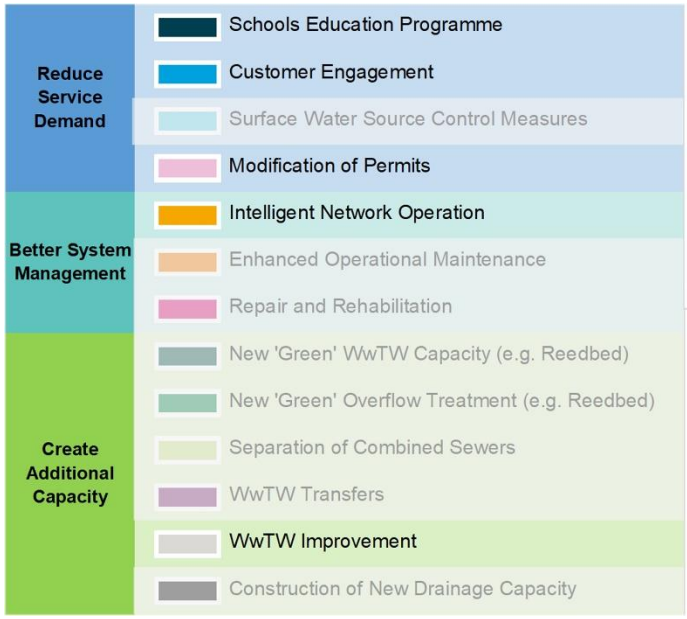
The data on this page gives details of the investment plan for Ambleside TPU. The plan shows the geographic location of Ambleside within the Kent Leven catchment.

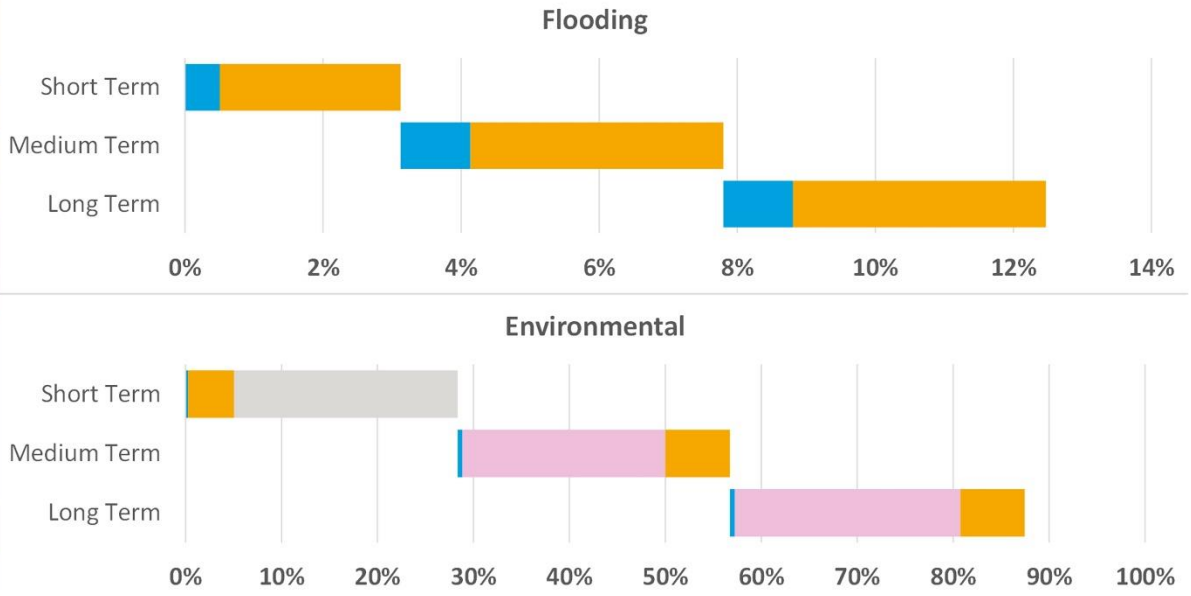
The pie chart to the right of the plan indicates the percentage spilt of proposed flooding and environmental investment. Environmental investment includes work to address storm overflows, wastewater treatment works and pollution of watercourses.

The bar charts below show a more detailed breakdown of the potential option types that make up the flooding and environmental investment. The key to the left of the bar charts show the colours used for the 13 different option types. Additionally, the charts indicate whether investments are proposed in the short, medium or long term.



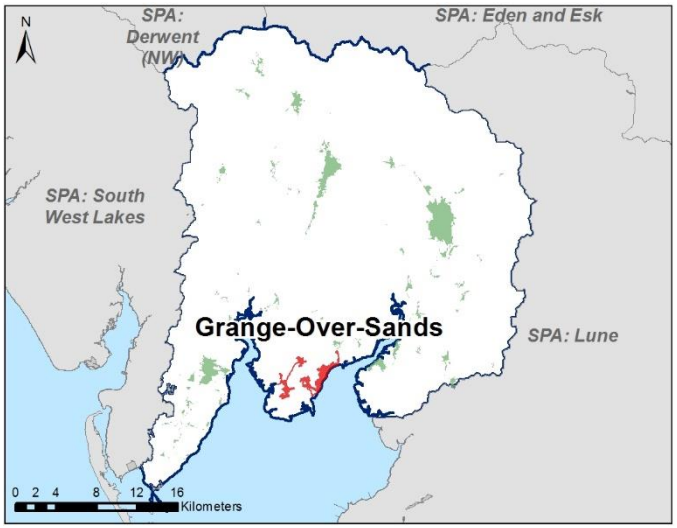
### 5.2.3.2 Grange-Over-Sands

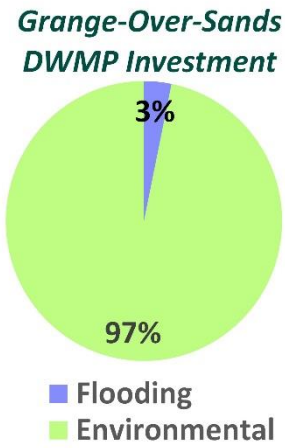
***Figure 23 Details of the DWMP investment plan for Grange-Over-Sands***

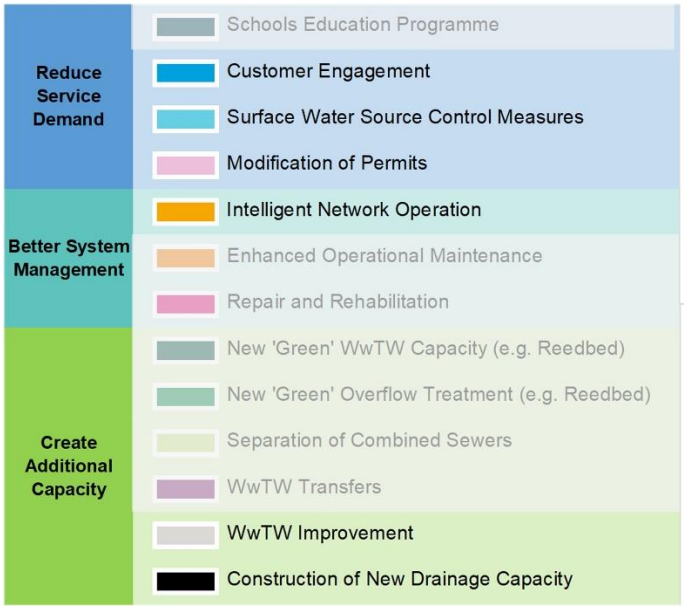
The data on this page gives details of the investment plan for Grange-Over-Sands TPU. The plan shows the geographic location of Grange-Over-Sands within the Kent Leven catchment.

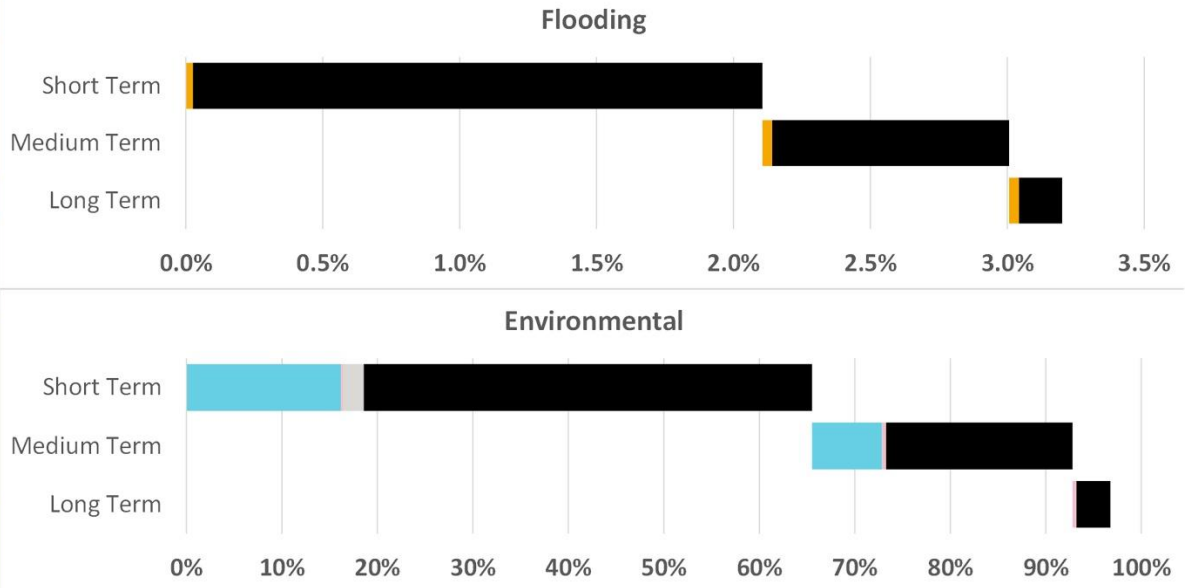
The pie chart to the right of the plan indicates the percentage spilt of proposed flooding and environmental investment. Environmental investment includes work to address storm overflows, wastewater treatment works and pollution of watercourses.

The bar charts below show a more detailed breakdown of the potential option types that make up the flooding and environmental investment. The key to the left of the bar charts show the colours used for the 13 different option types. Additionally, the charts indicate whether investments are proposed in the short, medium or long term.



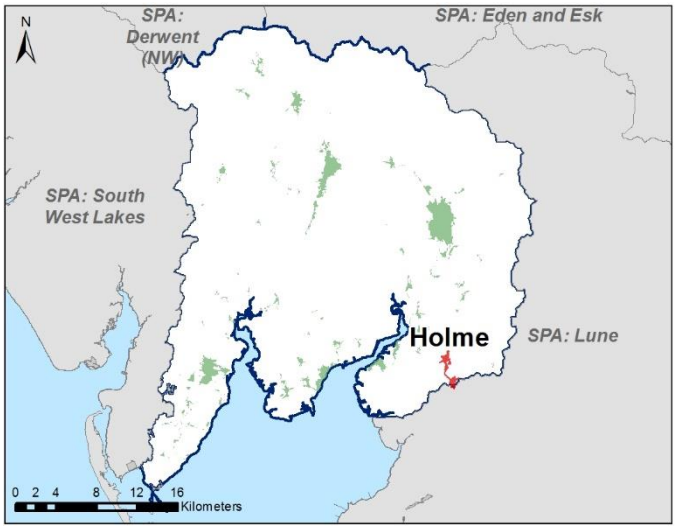
### 5.2.3.3 Holme

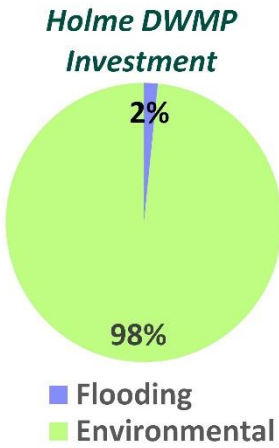
***Figure 24 Details of the DWMP investment plan for Holme***

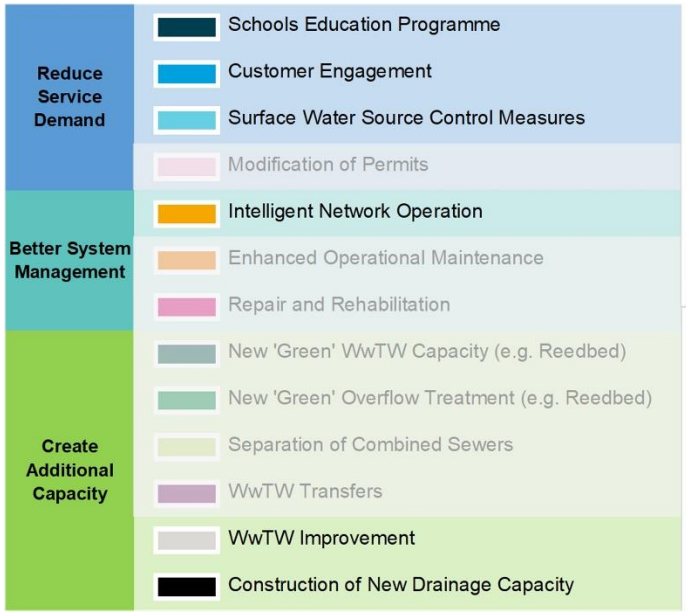
The data on this page gives details of the investment plan for Holme TPU. The plan shows the geographic location of Holme within the Kent Leven catchment.

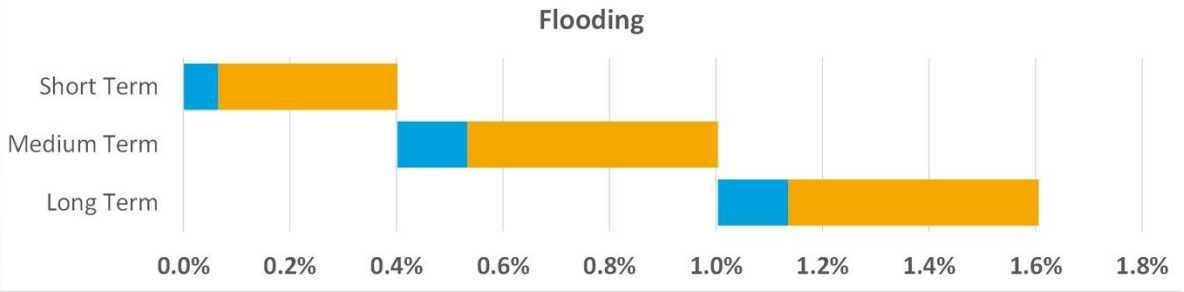
The pie chart to the right of the plan indicates the percentage spilt of proposed flooding and environmental investment. Environmental investment includes work to address storm overflows, wastewater treatment works and pollution of watercourses.

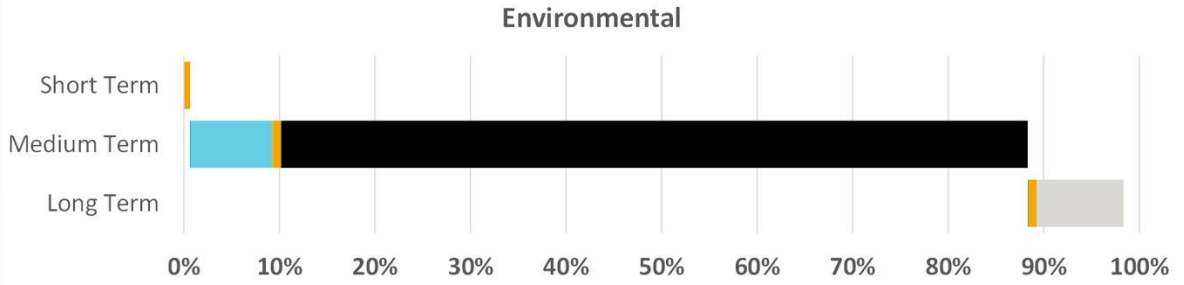
The bar charts below show a more detailed breakdown of the potential option types that make up the flooding and environmental investment. The key to the left of the bar charts show the colours used for the 13 different option types. Additionally, the charts indicate whether investments are proposed in the short, medium or long term.



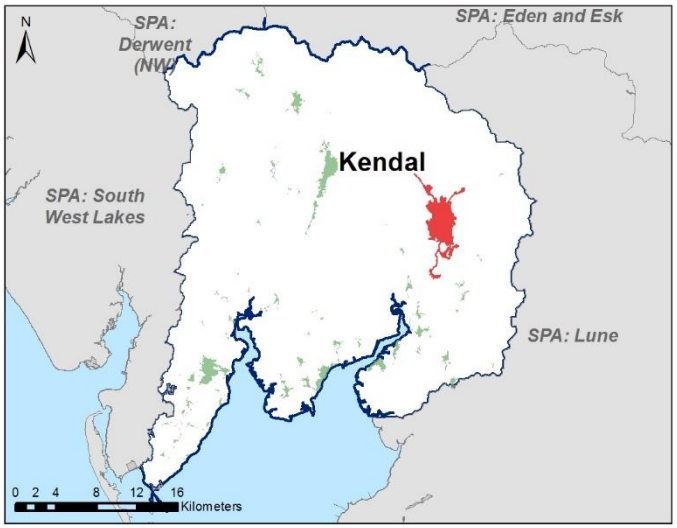
### 5.2.3.4 Kendal

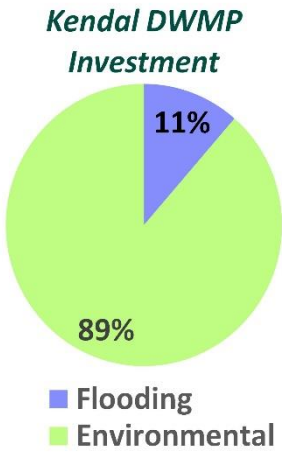
***Figure 25 Details of the DWMP investment plan for Kendal***

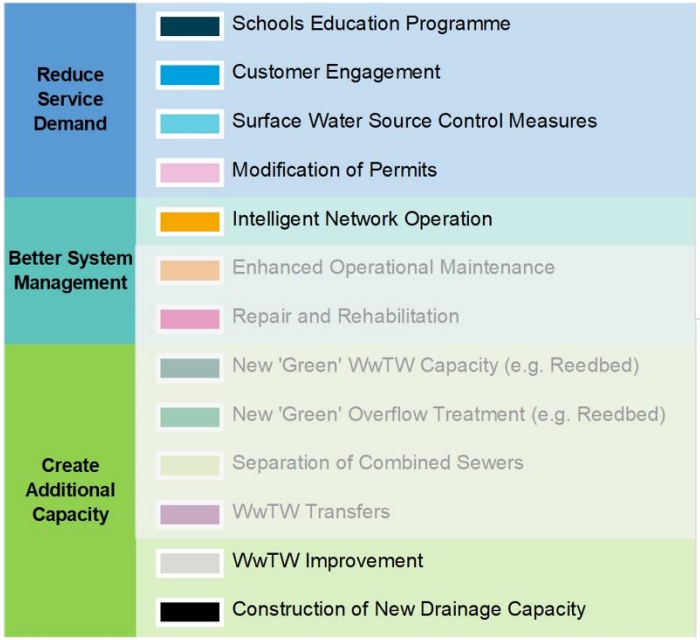
The data on this page gives details of the investment plan for Kendal TPU. The plan shows the geographic location of Kendal within the Kent Leven catchment.

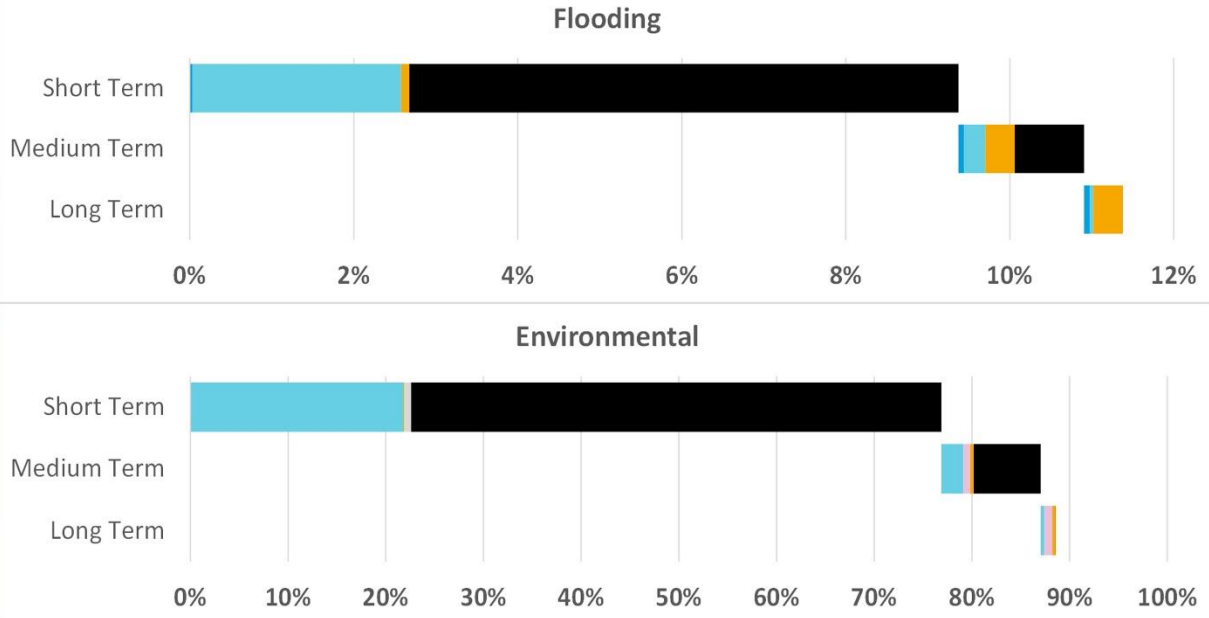
The pie chart to the right of the plan indicates the percentage spilt of proposed flooding and environmental investment. Environmental investment includes work to address storm overflows, wastewater treatment works and pollution of watercourses.

The bar charts below show a more detailed breakdown of the potential option types that make up the flooding and environmental investment. The key to the left of the bar charts show the colours used for the 13 different option types. Additionally, the charts indicate whether investments are proposed in the short, medium or long term.



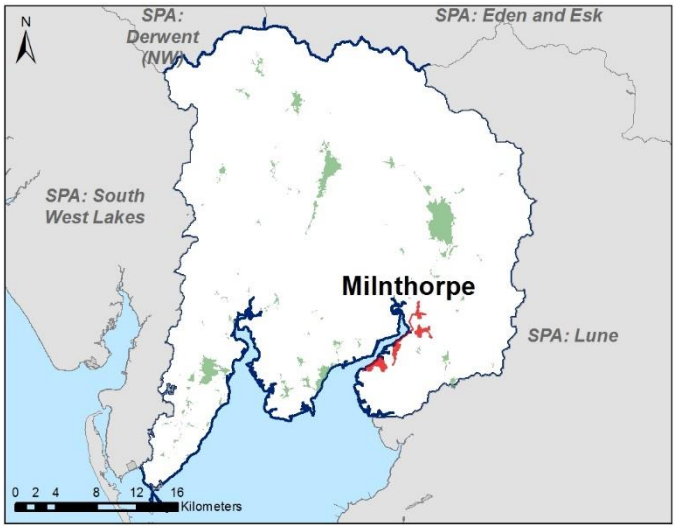
### 5.2.3.5 Milnthorpe

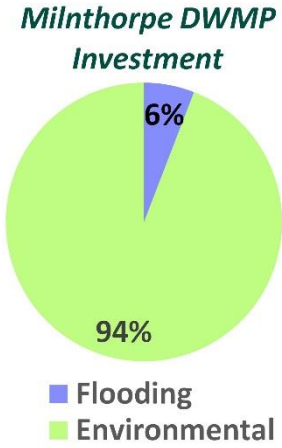
***Figure 26 Details of the DWMP investment plan for Milnthorpe***

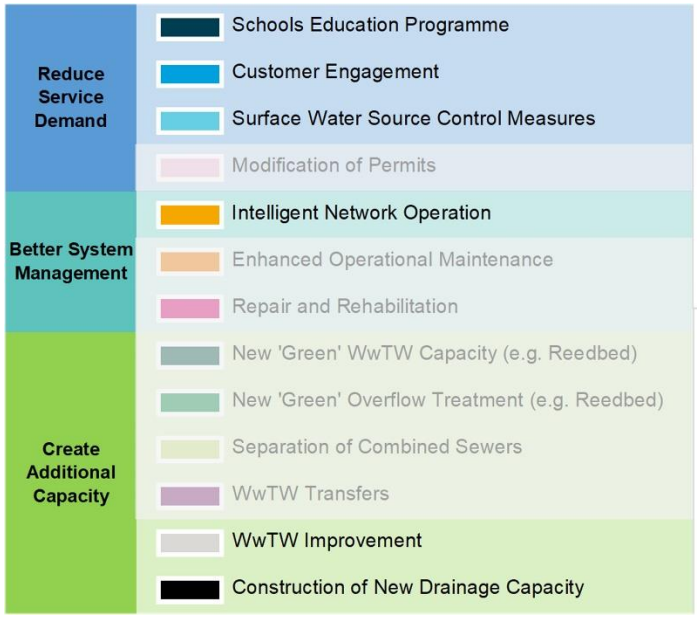
The data on this page gives details of the investment plan for Milnthorpe TPU. The plan shows the geographic location of Milnthorpe within the Kent Leven catchment.

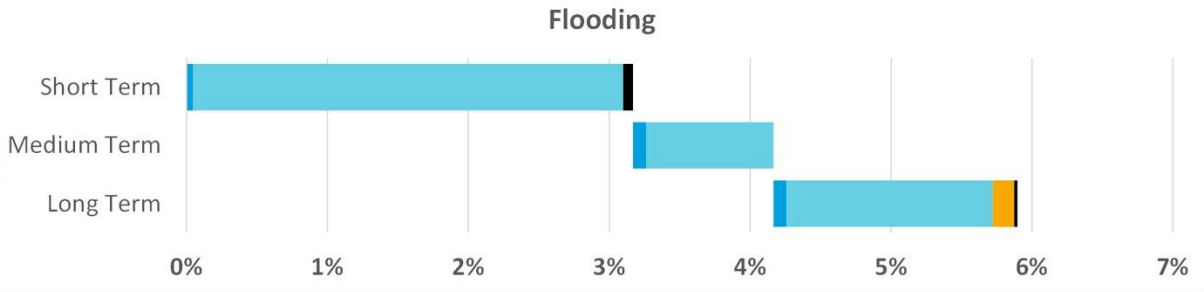
The pie chart to the right of the plan indicates the percentage spilt of proposed flooding and environmental investment. Environmental investment includes work to address storm overflows, wastewater treatment works and pollution of watercourses.

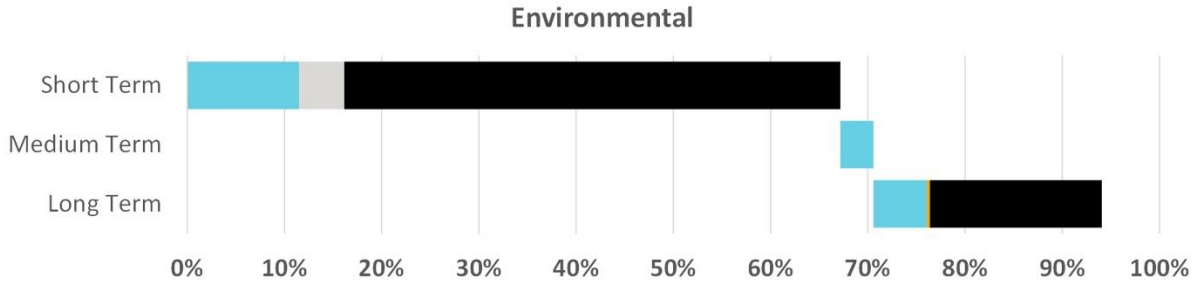
The bar charts below show a more detailed breakdown of the potential option types that make up the flooding and environmental investment. The key to the left of the bar charts show the colours used for the 13 different option types. Additionally, the charts indicate whether investments are proposed in the short, medium or long term.



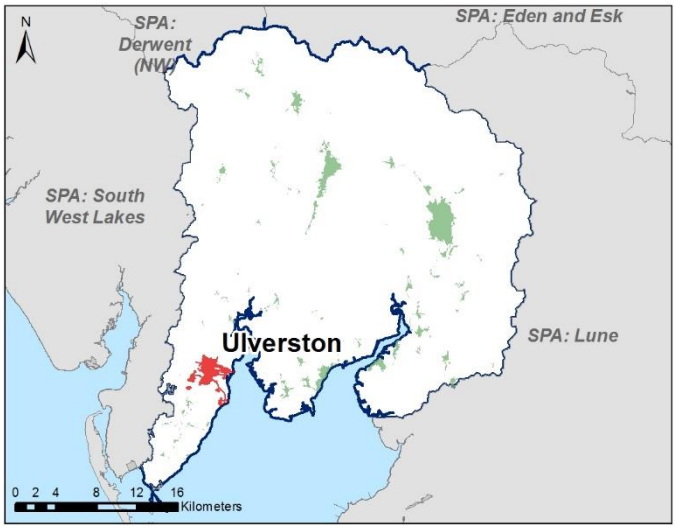
### 5.2.3.6 Ulverston

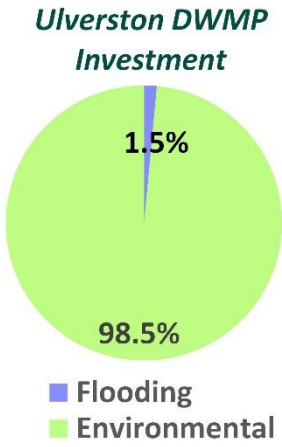
*Figure 27 Details of the DWMP investment plan for Ulverston*

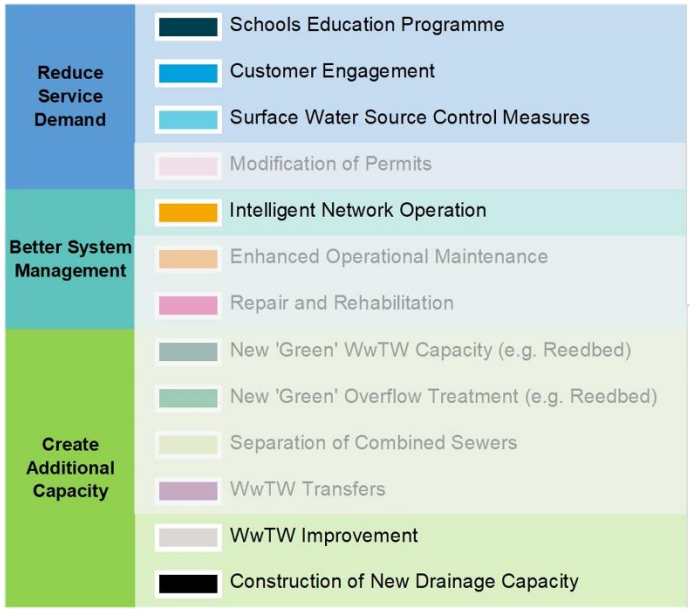
The data on this page gives details of the investment plan for Ulverston TPU. The plan shows the geographic location of Ulverston within the Kent Leven catchment.

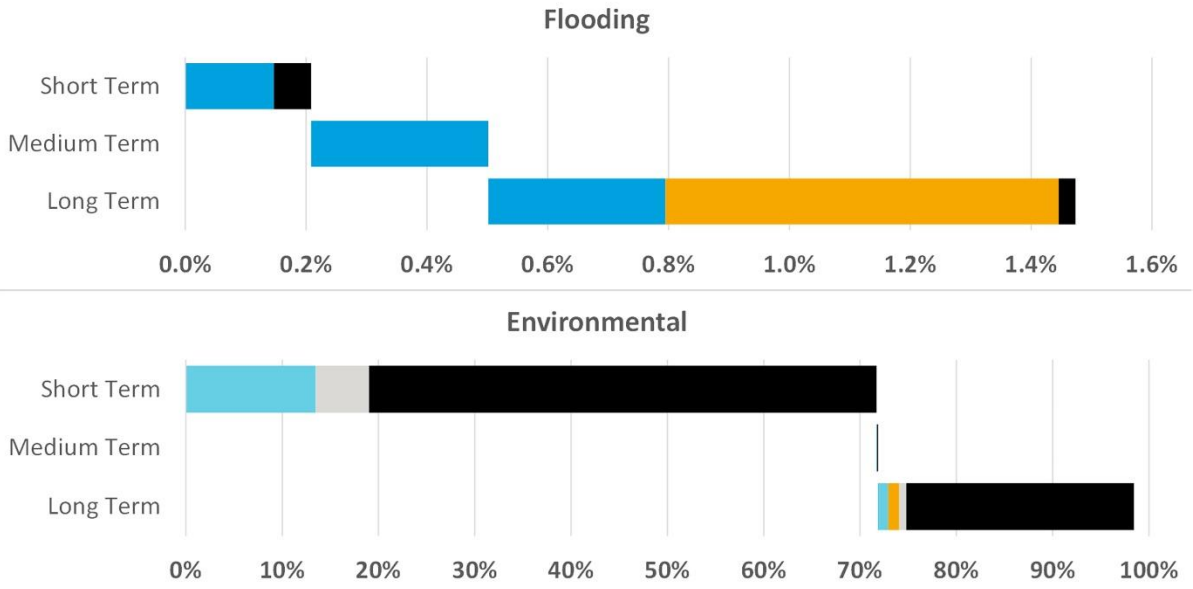
The pie chart to the right of the plan indicates the percentage spilt of proposed flooding and environmental investment. Environmental investment includes work to address storm overflows, wastewater treatment works and pollution of watercourses.

The bar charts below show a more detailed breakdown of the potential option types that make up the flooding and environmental investment. The key to the left of the bar charts show the colours used for the 13 different option types. Additionally, the charts indicate whether investments are proposed in the short, medium or long term.



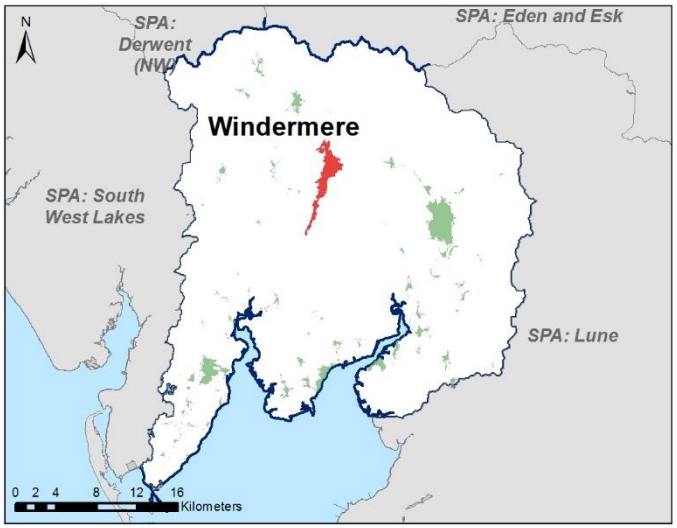
### 5.2.3.7 Windermere

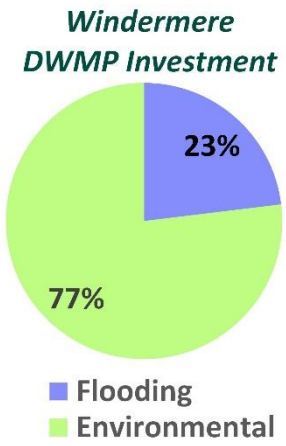
***Figure 28 Details of the DWMP investment plan for Windermere***

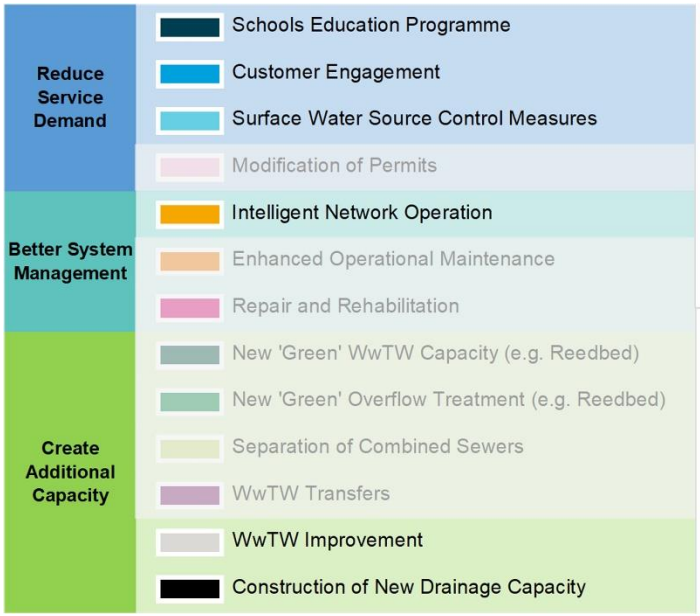
The data on this page gives details of the investment plan for Windermere TPU. The plan shows the geographic location of Windermere within the Kent Leven catchment.

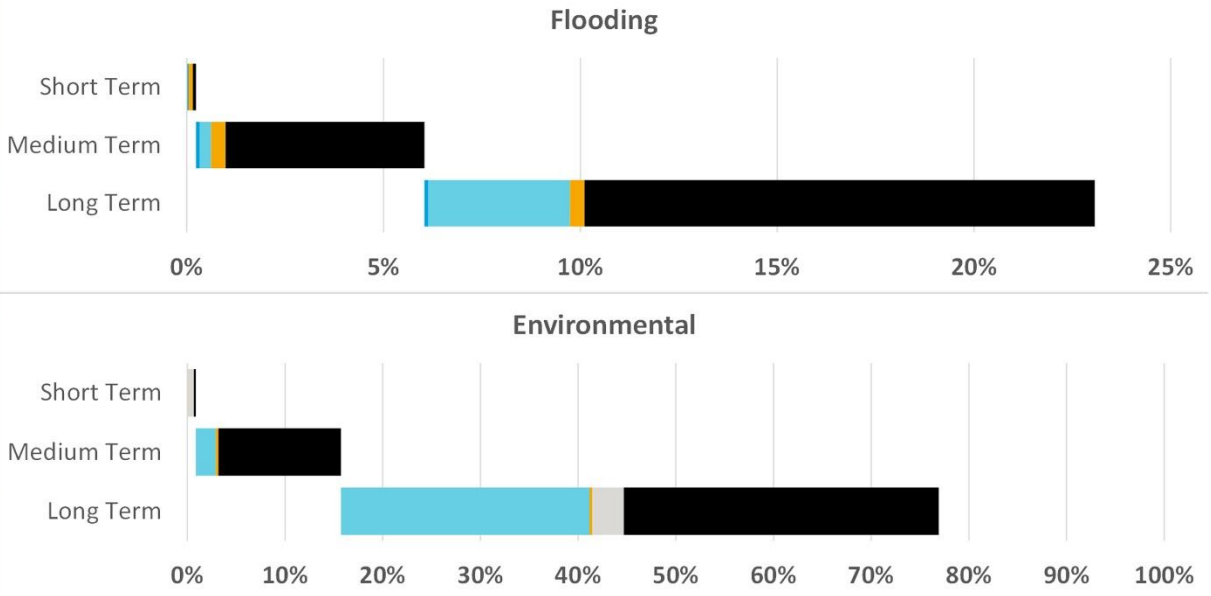
The pie chart to the right of the plan indicates the percentage spilt of proposed flooding and environmental investment. Environmental investment includes work to address storm overflows, wastewater treatment works and pollution of watercourses.

The bar charts below show a more detailed breakdown of the potential option types that make up the flooding and environmental investment. The key to the left of the bar charts show the colours used for the 13 different option types. Additionally, the charts indicate whether investments are proposed in the short, medium or long term.



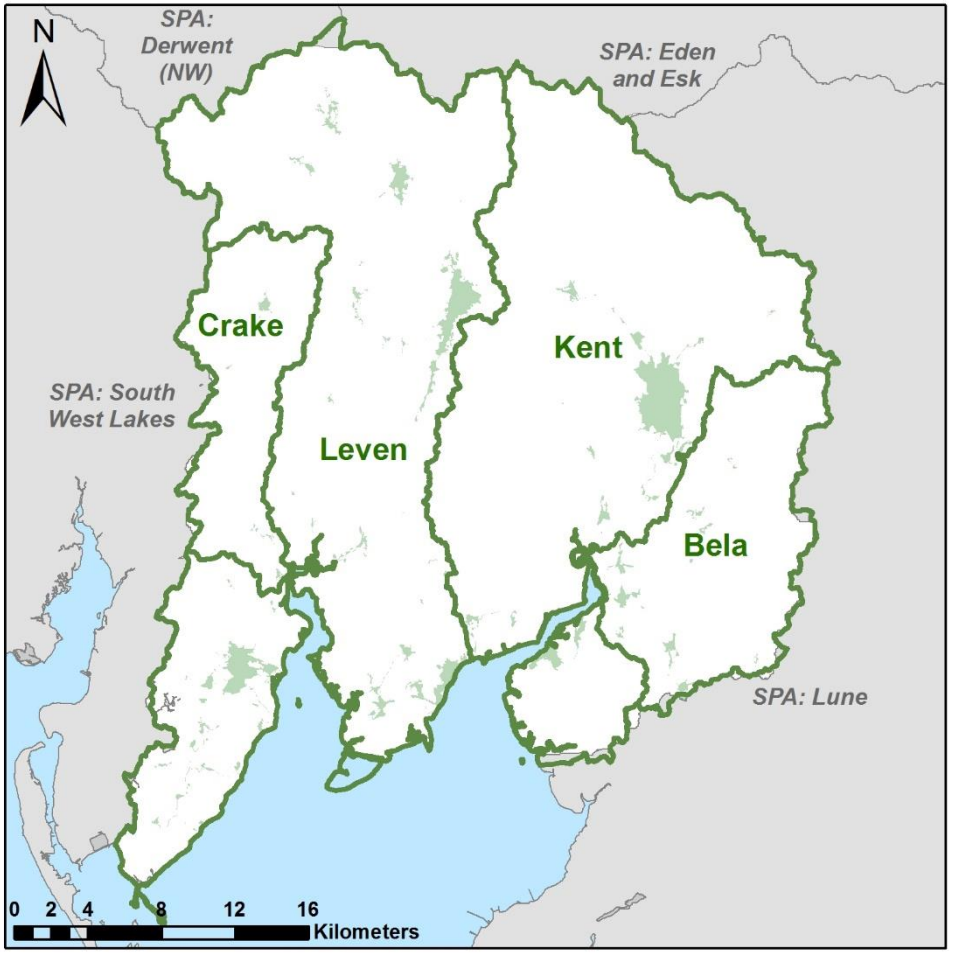



### 5.2.4 TPUs with population less than 2,000

Within the Kent Leven catchment, there are a number of small TPUs, each with a population of less than 2,000. For the purpose of reporting, these have been grouped together within Environment Agency operational catchment (OC) boundaries, which are sub-divisions of the overall SPA, aligned to local river systems. Within the Kent Leven, there are four Environment Agency operational catchment areas, which can be seen in Figure 29.

***Figure 29 Location of Environment Agency operational catchments within the Kent Leven SPA***




| Environment Agency Operational Catchment | TPUs |
|---|---|
| **Bela** | Beetham, Crooklands, Endmoor, Hutton Roof, Low Park, St Johns |
| **Crake** | Coniston, Crake Valley, Lowick Green No 1, Spark Bridge, Torver |
| **Leven** | Arrad Foot, Ayside, Bouth, Broughton Beck, Far Sawrey, Ferry House, Field Broughton, Grasmere, Haverthwaite, Hawkshead, High Newton, Langdale, Loppergarth, Marton (Ulverston), Marton Lane End, Near Sawrey, Newbiggin, Outgate, Oxen Park, Roa Island, Satterthwaite, Staveley-In-Cartmel Tank, Troutbeck |
| **Kent** | Bowston, Brigsteer, Grayrigg, Lindale, Staveley, Underbarrow |

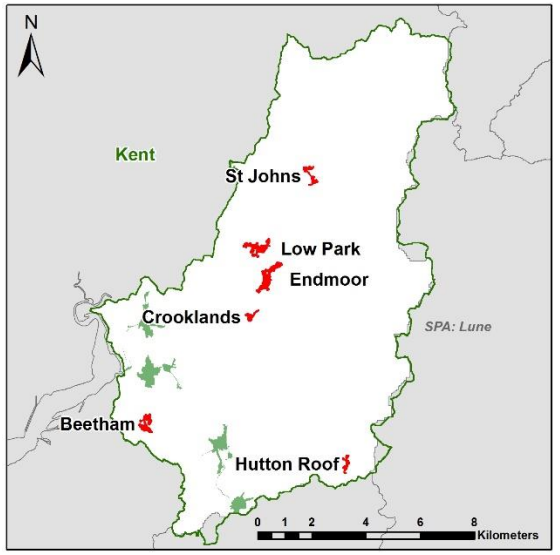
### 5.2.4.1 TPUs with population less than 2,000: Bela Operation Catchment (OC)

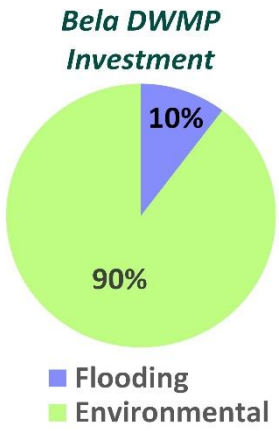
***Figure 30 Details of the DWMP investment plan for the Bela OC***

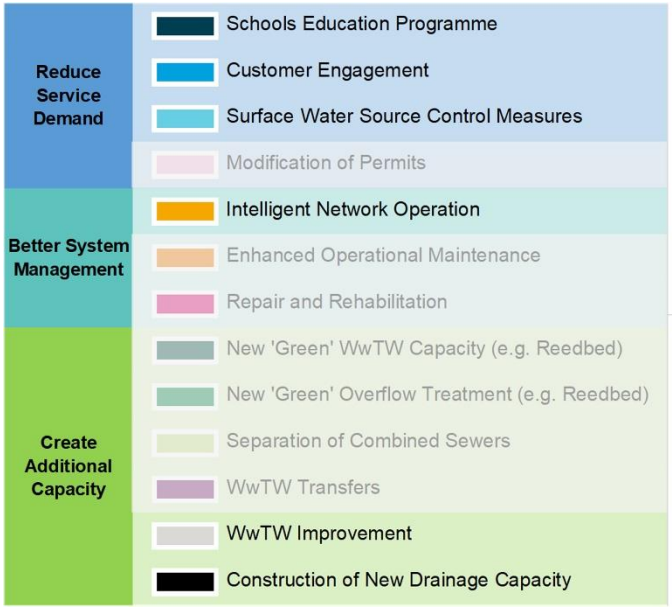
The data on this page gives details of the investment plan for the TPUs within the Bela OC. The plan shows the geographic location of these TPUs within the Bela OC.

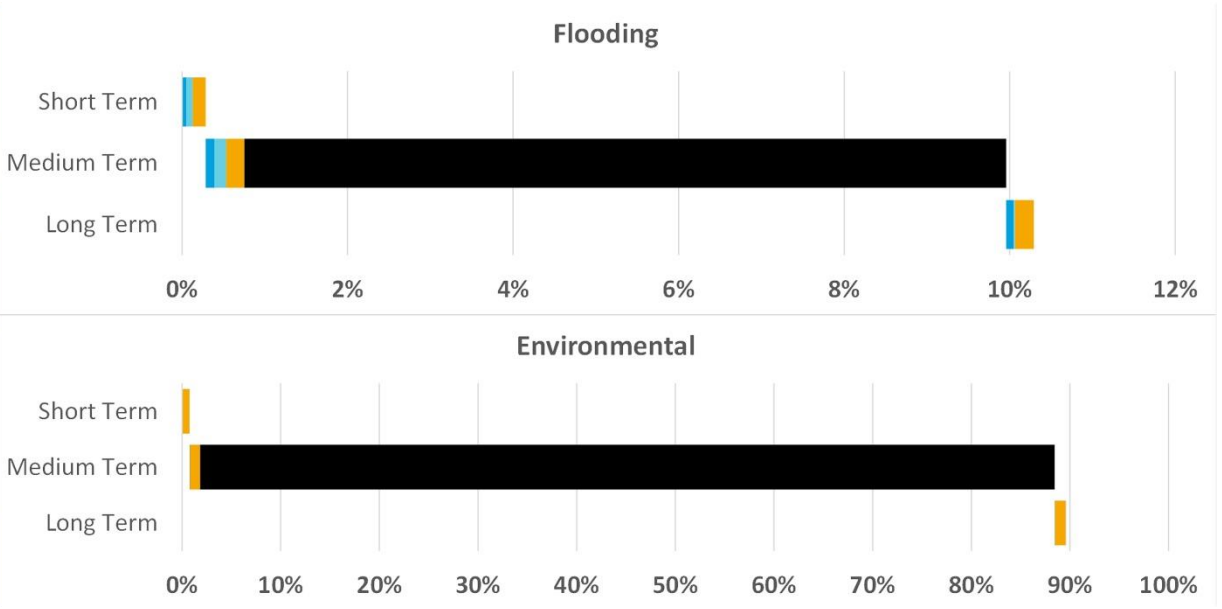
The pie chart to the right of the plan indicates the percentage spilt of proposed flooding and environmental investment. Environmental investment includes work to address storm overflows, wastewater treatment works and pollution of watercourses.

The bar charts below show a more detailed breakdown of the potential option types that make up the flooding and environmental investment. The key to the left of the bar charts show the colours used for the 13 different option types. Additionally, the charts indicate whether investments are proposed in the short, medium or long term.



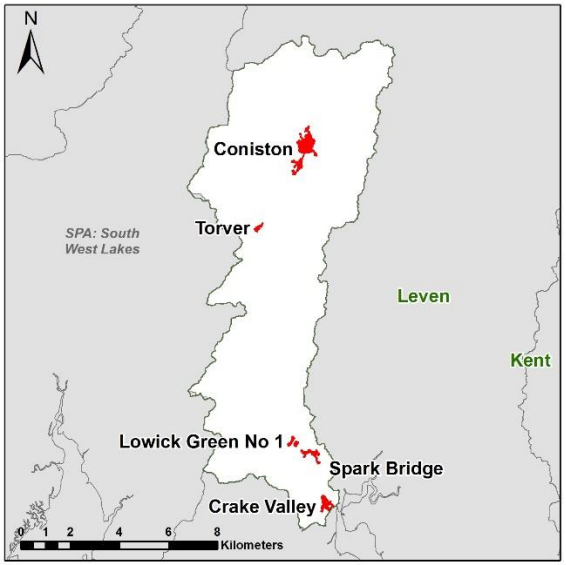
### 5.2.4.2 TPUs with population less than 2000: Crake Operational Catchment (OC)

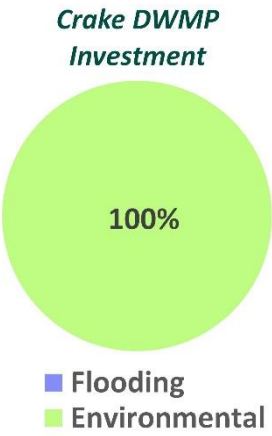
*Figure 31 Details of the DWMP investment plan for the Crake OC*

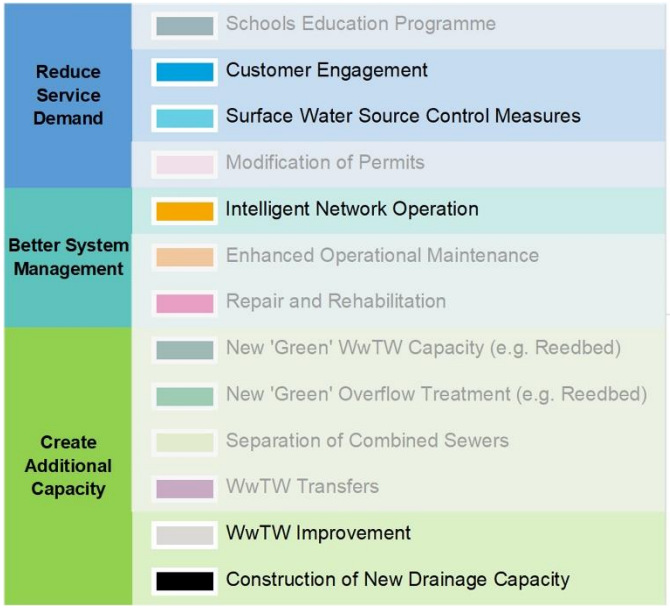
The data on this page gives details of the investment plan for the TPUs within the Crake OC. The plan shows the geographic location of these TPUs within the Crake OC.

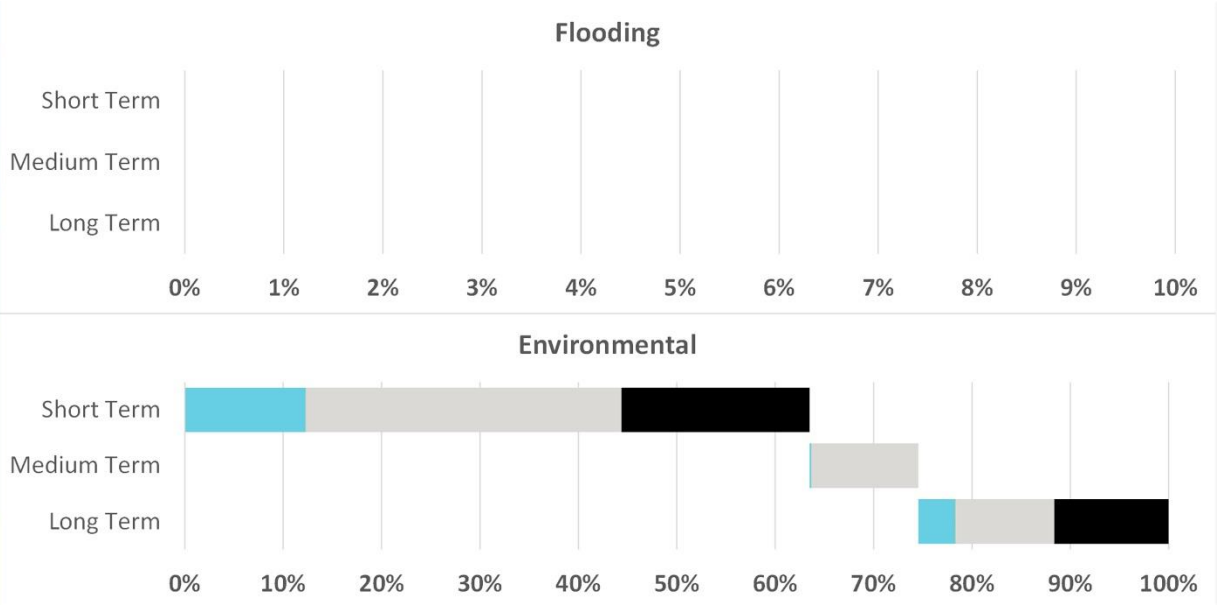
The pie chart to the right of the plan indicates the percentage spilt of proposed flooding and environmental investment. Environmental investment includes work to address storm overflows, wastewater treatment works and pollution of watercourses.

The bar charts below show a more detailed breakdown of the potential option types that make up the flooding and environmental investment. The key to the left of the bar charts show the colours used for the 13 different option types. Additionally, the charts indicate whether investments are proposed in the short, medium or long term.



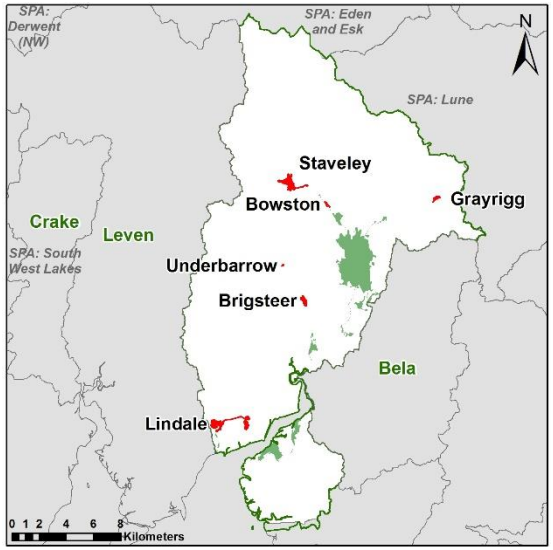
### 5.2.4.3 TPUs with population less than 2000: Kent Operation Catchment (OC)

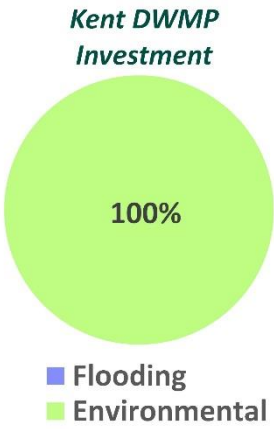
*Figure 32 Details of the DWMP investment plan for the Kent OC*

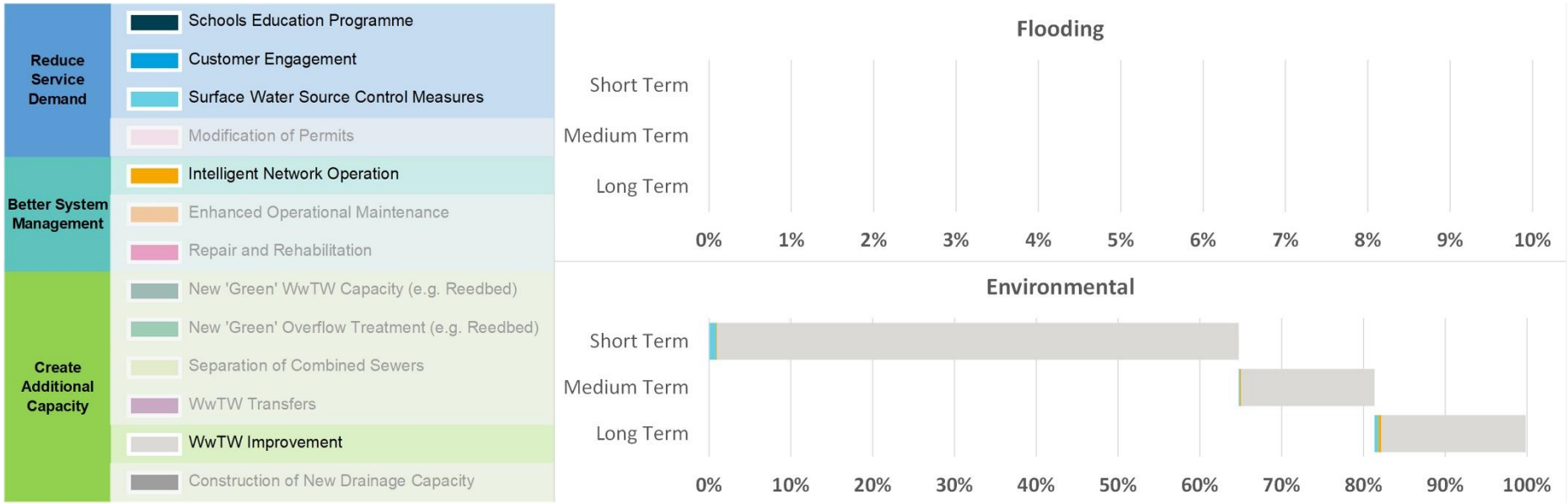
The data on this page gives details of the investment plan for the TPUs within the Kent OC. The plan shows the geographic location of these TPUs within the Kent OC.

The pie chart to the right of the plan indicates the percentage spilt of proposed flooding and environmental investment. Environmental investment includes work to address storm overflows, wastewater treatment works and pollution of watercourses.

The bar charts below show a more detailed breakdown of the potential option types that make up the flooding and environmental investment. The key to the left of the bar charts show the colours used for the 13 different option types. Additionally, the charts indicate whether investments are proposed in the short, medium or long term.



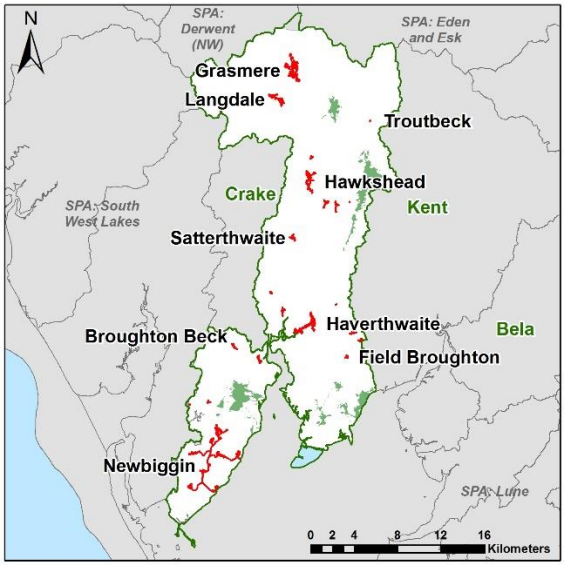
### 5.2.4.4 TPUs with population less than 2,000: *Leven Operational Catchment (OC)*

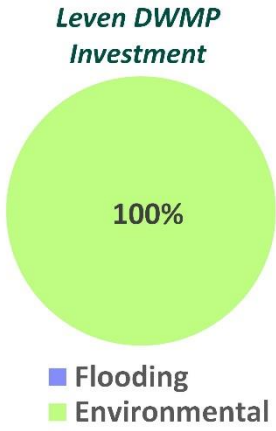
***Figure 33 Details of the DWMP investment plan for the Leven OC***

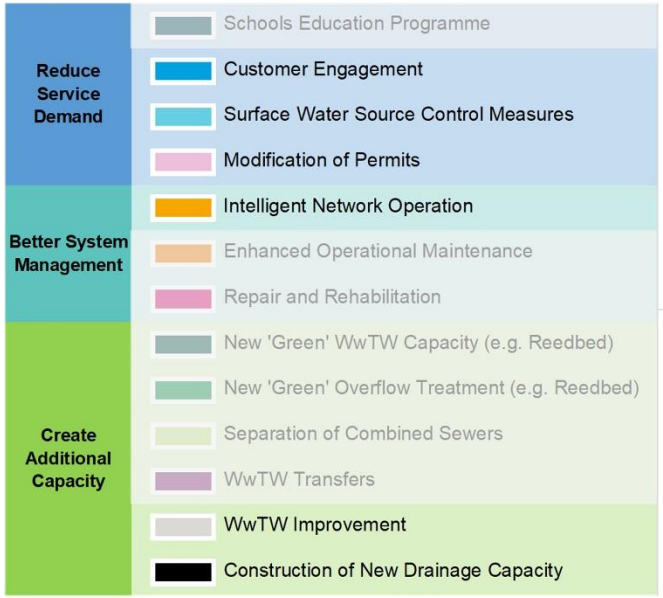
The data on this page gives details of the investment plan for the TPUs within the Leven OC. The plan shows the geographic location of these TPUs within the Leven OC.

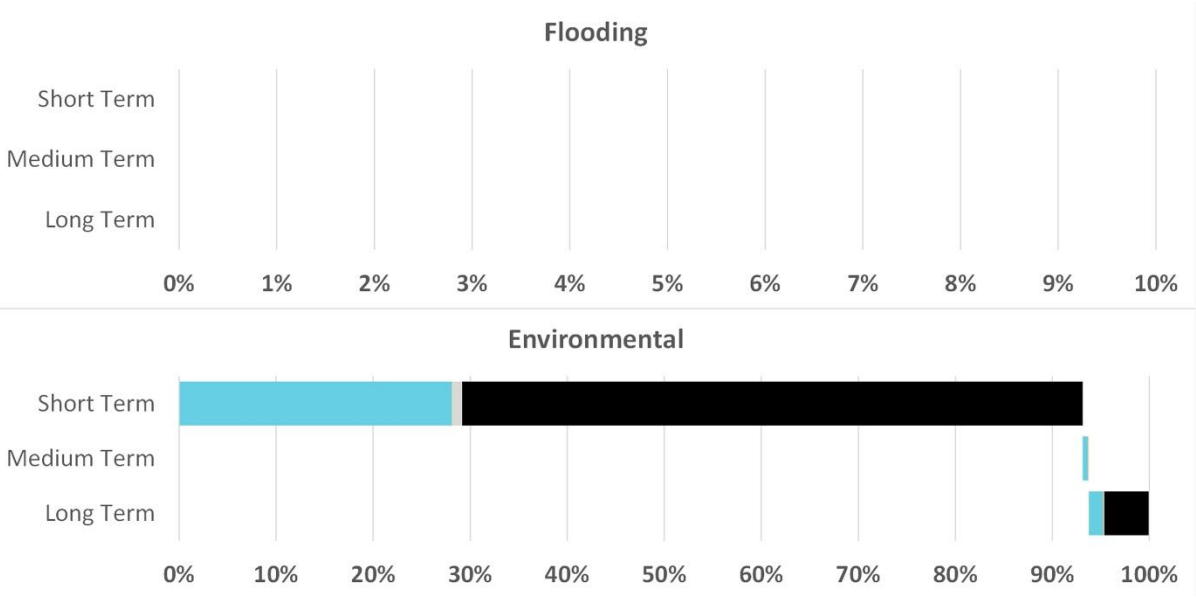
The pie chart to the right of the plan indicates the percentage spilt of proposed flooding and environmental investment. Environmental investment includes work to address storm overflows, wastewater treatment works and pollution of watercourses.

The bar charts below show a more detailed breakdown of the potential option types that make up the flooding and environmental investment. The key to the left of the bar charts show the colours used for the 13 different option types. Additionally, the charts indicate whether investments are proposed in the short, medium or long term.



## 5.3 Other projects and investment

In addition to the improvements and benefits that the WINEP and the DWMP will drive in the years to come, there are also other projects that will help to achieve our ambitions. One of which is our Better Rivers: Better North West project which aims to improve the region's river water quality.

### 5.3.1 Better Rivers: Better North West

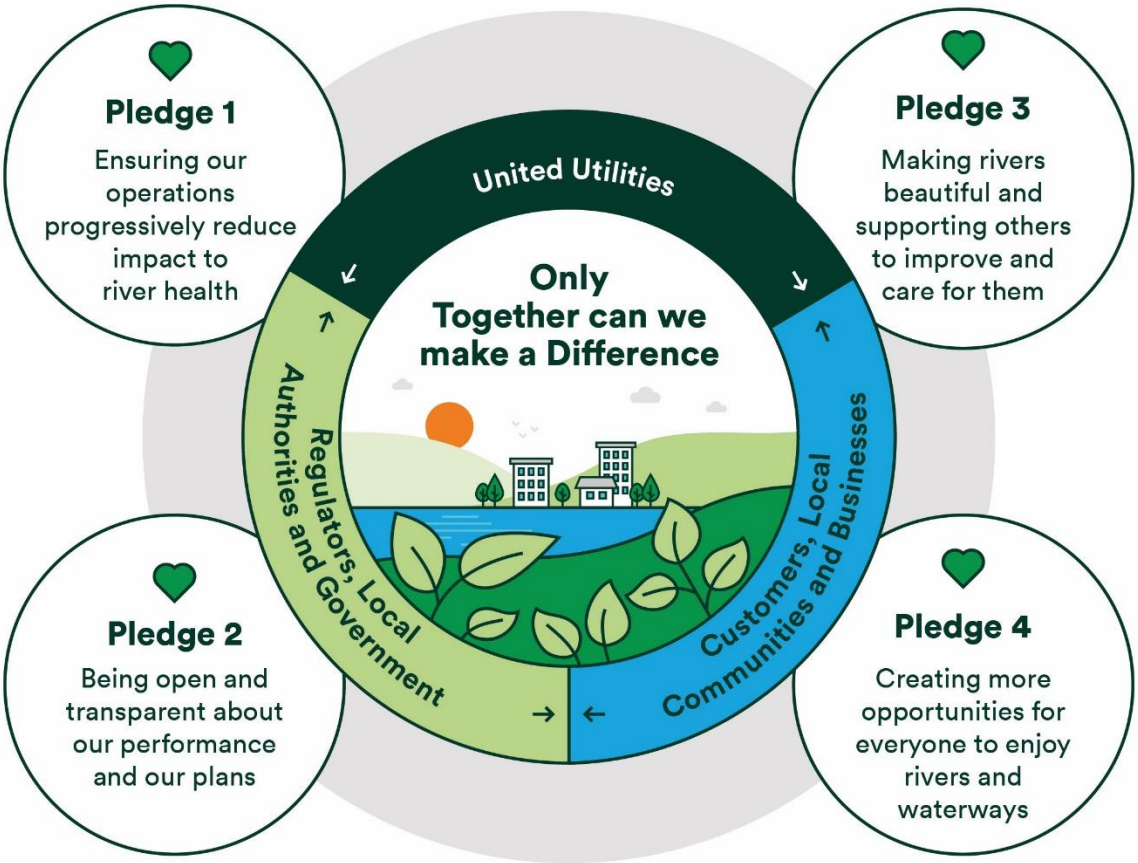
The North West is home to some of the most beautiful natural landscapes. We take our role in protecting them very seriously so they can be enjoyed by all. We are investing significantly to reduce the impact that wastewater has on the natural environment and our long-term ambition is to eliminate pollution incidents.

We want to demonstrate how we are addressing concerns regarding storm overflows and making our contribution to improving river health. Through our Better Rivers: Better North West plan, we have made four pledges which will include improving our wastewater network and treatment assets, collecting more data and sharing it, greater innovation and more use of nature-based solutions (Figure 34).

We are determined to build a coalition of the willing to improve the region's river water quality and catalyse action from many parties. At the heart of this will be addressing surface water management at scale and securing continued investment in effective end-to-end wastewater management is necessary to improve river water quality. This programme sets out our ambitions for the next three years and beyond.

You can find out more about the Better Rivers: Better North West plan on our website (https://www.unitedutilities.com/corporate/responsibility/environment/reducing-pollution/storm-overflows/our-commitments-to-river-health/).

***Figure 34 Overview of the Better Rivers: Better North West project***



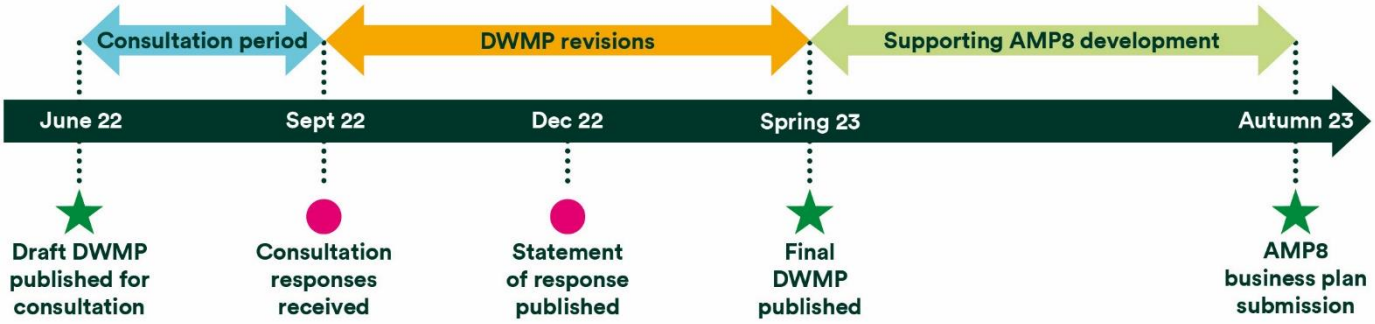
# 6. Embedding the DWMP

Since we began our DWMP journey when the framework was published in 2018, we have now produced our first ever plan. We have done this with the support from customers and stakeholders where we have listened to, reflected upon and made changes to different views, priorities and ambitions that we have for the North West, now and in the future.

The DWMP encompasses a host of documents covering different topic areas from assessing risks to identifying opportunities, and the SPA documents like this one for the Kent Leven catchment. The DWMP is not a static programme and will continue to work with stakeholders to develop partnership options and strategies, which will make a difference within the Kent Leven catchment.

Moving forwards, the DWMP will be a key component in the development of our business plan for investment cycle 2025 – 2030 (AMP8, Figure 35). Here, we will be able to continue to work in partnership to identify joint opportunities to mitigate risk, to improve the environment and create spaces for communities to enjoy.

***Figure 35 Timeline of key milestones***



# 7. References

[1] https://environment.data.gov.uk/catchment-planning/ManagementCatchment/3045
[2] https://environment.data.gov.uk/catchment-planning/OperationalCatchment/3029
[3] https://environment.data.gov.uk/catchment-planning/OperationalCatchment/3111
[4] https://environment.data.gov.uk/catchment-planning/OperationalCatchment/3243
[5] https://environment.data.gov.uk/catchment-planning/OperationalCatchment/3251
[6] https://environment.data.gov.uk/catchment-planning/OperationalCatchment/3251
[7] https://environment.data.gov.uk/catchment-planning/v/c3-plan/CatchmentPartnership/WEIF3301
[8] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1120229/North-West-FRMP-2021-2027.pdf
[9] https://www.mycoastline.org.uk/shoreline-management-plans/
[10] https://www.gov.uk/government/publications/surface-water-management-plan-technical-guidance
[11] https://btob.scrt.co.uk/south-cumbria-catchment-plan

# Appendix A

***Table A.1 List of TPUs which did not trigger for RBCS across environment, flooding or wastewater treatment works categories***

| TPU name | Environment | Flooding | Wastewater Treatment Works |
|---|---|---|---|
| **Ayside** | Not triggered in RBCS | Not triggered in RBCS | Not triggered in RBCS |
| **Bouth** | Not triggered in RBCS | Not triggered in RBCS | Not triggered in RBCS |
| **Brigsteer** | Not triggered in RBCS | Not triggered in RBCS | Not triggered in RBCS |
| **Broughton Beck** | Not triggered in RBCS | Not triggered in RBCS | Not triggered in RBCS |
| **Crooklands** | Not triggered in RBCS | Not triggered in RBCS | Not triggered in RBCS |
| **Endmoor** | Not triggered in RBCS | Not triggered in RBCS | Not triggered in RBCS |
| **Field Broughton** | Not triggered in RBCS | Not triggered in RBCS | Not triggered in RBCS |
| **High Newton** | Not triggered in RBCS | Not triggered in RBCS | Not triggered in RBCS |
| **Hutton Roof** | Not triggered in RBCS | Not triggered in RBCS | Not triggered in RBCS |
| **Loppergarth** | Not triggered in RBCS | Not triggered in RBCS | Not triggered in RBCS |
| **Low Park** | Not triggered in RBCS | Not triggered in RBCS | Not triggered in RBCS |
| **Lowick Green No 1** | Not triggered in RBCS | Not triggered in RBCS | Not triggered in RBCS |
| **Marton Lane End** | Not triggered in RBCS | Not triggered in RBCS | Not triggered in RBCS |
| **Outgate** | Not triggered in RBCS | Not triggered in RBCS | Not triggered in RBCS |
| **Oxen Park** | Not triggered in RBCS | Not triggered in RBCS | Not triggered in RBCS |
| **Satterthwaite** | Not triggered in RBCS | Not triggered in RBCS | Not triggered in RBCS |
| **St Johns** | Not triggered in RBCS | Not triggered in RBCS | Not triggered in RBCS |
| **Staveley-In-Cartmel Tank** | Not triggered in RBCS | Not triggered in RBCS | Not triggered in RBCS |
| **Torver** | Not triggered in RBCS | Not triggered in RBCS | Not triggered in RBCS |
| **Troutbeck** | Not triggered in RBCS | Not triggered in RBCS | Not triggered in RBCS |
| **Underbarrow** | Not triggered in RBCS | Not triggered in RBCS | Not triggered in RBCS |

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