
Future Proofing Deal's Water Systems:

Protect - Sustain - Clean and green

Deal Pathfinder: May 2022 Summary Report

DEAL Working together for
a sustainable future

Water Taskforce



Office of
Natalie Elphicke MP

Southern
Water



**WATER
for LIFE**

from

**Southern
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Introduction

Natalie Elphicke OBE MP, Member of Parliament for Dover & Deal and Ian MacAulay, Chief Executive of Southern Water

For too many years, flooding in Deal - especially in Albert Road - has been a real source of community concern. There has been some action taken but the frequency of the flooding has continued to be a serious problem. After years of technical wrangling over what could be done and who by, a fresh approach was needed. An approach that had at its very heart a full review of how the water system was working across the area, and a proper understanding of the technical issues and possible solutions. In short, a proposal on how best to tackle a situation that has gone on far too long.

That's why we agreed to set up and jointly chair the Deal Water Action Task Force – a task force to find lasting solutions. In addition to the work of Southern Water and the Office of Natalie Elphicke MP, officer and councillor representatives from Kent County Council and Dover District Council have also taken part, with DDC and KCC also providing detailed technical advice and support to the project.

Southern Water inevitably take the lead on sewage management. Yet Kent County Council are responsible for highways drainage. Dover District Council are essential as the planning authority and owners of many vital assets, including some waterways. Solving our water issues we have in Deal requires everyone to play their part and we are really pleased with the way everyone has come together, with each member working to fix issues that have been identified during the detailed technical work. The work of the taskforce has revealed three key priorities:

To better **Protect** residents from flooding. Especially the long-suffering residents of Albert Road. This report proposes improvements that will help, and outlines changes that have already happened while this work has been ongoing.

To **Sustain** our water resources, enabling water to be held by homeowners in water tanks and recycled, or released once it has stopped raining. This will reduce pressure on our drainage system.

To **Clean and green** our waterways is essential. Storm overflows - where untreated sewage is discharged into rivers and the sea to prevent further flooding - are a source of public concern. This report sets out serious proposals as to how these overflows can be significantly reduce, which in turn improves the environment and cleanliness of our local waterways.

Deal is one of Southern Water's pioneering Pathfinder projects and will demonstrate that by working in partnership with the community and its representatives, the use of storm overflows can be reduced.

Deal's water system and drainage matters to us all. Everyone has a part to play - whether it is installing a water butt to catch rainwater to use on the garden, or making sure wet wipes go in the bin, not down the toilet.

The problems have gone on for too long. This is our chance to protect Deal from flooding, increase water sustainability, and make our rivers and seas cleaner and greener in the years to come.

Natalie Elphicke

Ian MacAulay



Executive summary

Getting the management of drainage right in our communities is becoming increasingly important. If rainfall water fills our sewer network, surrounding areas can get flooded and we have to use storm overflows to release the pressure on the network. As climate change gives us heavier rain, and our sewage system has to cope with more and more surface water, the problem will only intensify. This affects our communities and the precious environment around us, as flood water enters our rivers and seas. That is why our pathfinder projects were created. The first project has been developed for Deal, and it is managed by the Deal Water Action Task Force.

The Deal Water Action Task Force was formed to work together to understand the drainage network of Deal. The group's purpose was to meet, agree and support different ways of working to better control and manage surface water in the area.

This Pathfinder project is the first step in alleviating flooding in Deal and its overall aim is to future proof the drainage infrastructure in the area. The project seeks to find and test innovative solutions to drainage issues that can be rolled out across Southern Water's region.

In Albert Road, detailed technical work has been undertaken to investigate, survey and map the overground and underground movement of rainwater and sewage to better understand the persistent flooding around Albert Road. During these investigations key actions have been approved and undertaken which are designed to make the water system work more efficiently in the immediate term. Immediate actions taken include:

- A new lighter gauge flap at the 90-degree pipe turn at Albert Road. The 90-degree pipe turn was a specific issue raised by the residents of Albert Road with the taskforce team.
- The installation of new pumps at Golf Road Pumping Station.
- The cleaning of screens and pipes to reduce the chance of blockages.

Further steps have been identified and approved to increase capacity and performance which will be in place by Autumn 2022. These will ensure that current assets are working to optimal levels are:

- The installation of a high-capacity highway gullies in Albert Road to ensure rainwater runoff is dealt with effectively
- A new high-capacity pipe in Albert Road to re-direct more surface water away from Albert Road to Matthews Close Dyke, relieving the strain on Albert Road itself. This will provide additional capacity in the road, to deal with high volumes of excess water during heavy rainfall.
- Improved resilience at Golf Road Pumping Station with additional monitoring instruments and control systems. Modernising the pumping station's controls and catchment situational awareness to optimise performance under all weather conditions.

These improvements will improve the effectiveness and resilience of the existing road and sewage system. However, more needs to be done to address the increased urbanisation of the physical landscape to allow for more natural absorption of rainwater. Recommendations for this work will involve a broader footprint than the Albert Road area. These more extensive measures will be vital in making significant progress towards eliminating sea discharges and work on these will start from Autumn 2022. This work includes:

- Trialling 'slow the flow' measures on streets such as bigger planters, rain gardens and swales, as well as working with larger premises e.g. schools and supermarkets.



- Designing new measures to improve capacity in the sewer system.
- Installing additional monitoring instruments and control systems to improve resilience across the area.
- Evaluation of the success of the 'slow the flow' measures with residents and further roll out across the area.

There will be an evaluation, assessment, and further work to roll out the 'slow the flow' approach, together with state-of-the-art monitoring and control equipment being installed to provide greater 'real-time' understanding and responsiveness. As such, this isn't a one-shot solution, it is part of an ongoing commitment from Southern Water and the Taskforce partners to the Deal water catchment area.

Please find a full copy of the report by visiting www.southernwater.co.uk/our-performance/storm-overflows/pathfinder-projects

1.0 Deal Water Action Task Force

The Deal Water Action Task Force (Deal-WAT) is co-chaired by Natalie Elphicke MP and Southern Water with other members including Kent County Council and Dover District Council. The taskforce was formed in 2021 in response to regular flooding, particularly in Albert Road. All members of the taskforce are keen to actively find ways to alleviate the continued issues being experienced by residents. It has a clear purpose to meet, agree and support different ways of working to better manage surface water in Deal.

The work of the taskforce has been evidentially based and technically researched with over £500,000 of resources committed to the project to date. One of the core challenges to resolving the current flooding issues has been a difference of reports and views over decades. This taskforce has commissioned fresh technical surveys and modelling work. It has assessed and considered a range of suggested reasons and solutions, resulting in a set of agreed evidence statements, as well as proposed immediate and longer-term solutions. Deal-WAT is grateful to Albert Road residents, and other residents in Deal, for their photos and other evidence submitted as part of the taskforce work. We strongly encourage residents to continue to send Deal-WAT their photographs and evidence to help inform future developments and interventions.

2.0 The Deal pathfinder project

This pathfinder project is the first step in alleviating flooding in Deal and its overall aim is to future proof the drainage infrastructure in the area. The project seeks to find and test innovative solutions to drainage issues that can be rolled out across Southern Water's region.

In Albert Road, several investigations and surveys have been undertaken where repeated flooding incidents have occurred for decades, resulting in wastewater and surface water flooding homes. Furthermore, persistent flood alerts have required residents to take mitigating actions.

There are additional investigations and work ongoing, but an explanation of the technical work undertaken to date can be found in the [full technical report](#).

The actions and recommendations of the taskforce are summarised as follows, with further information contained in the full Technical Report.

3.0 Understanding different water management approaches

Deal is served by two principally different sewage collection systems.

The first is known as a 'combined sewer' system and encompasses historic Deal, see Figure 1. This system is sometimes referred to as the Victorian or Bazalgette approach, after the great architect of the London sewage system.

In simple terms, rainwater (surface water) from impermeable areas e.g. roofs, driveways and highways, enters the same sewerage system which is used to remove foul water from homes and businesses. All water is then treated together before it is released or reused. During rainfall, wastewater flows can increase from, up to 30 times the 'dry weather' flow. Storm tanks in the network are often used to hold excess water before returning them for treatment.

The advantage of the combined sewer system is that it is simple and in general effective at taking away both sewage and rainwater. However, there are two main challenges:

- It requires all water to be treated, instead of enabling non-contaminated rainwater to be readily reused and recycled back into the environment.
- Rainwater falling on our buildings, highways, and paved areas, is designed to drain any area of rainwater as quickly as possible.

The second of the systems is 'dual/separate pipe sewer' system. This has been more widely used since the 1950s. It separates the customers' foul water from the surface water, meaning that the rainwater can be recycled back into the environment and the wastewater can be treated. The dual pipe system covers part of the wider Deal town area, see Figure 1. This separate arrangement enables the treatment and disposal of wastewater more effectively, but the speed of rainwater runoff remains much greater than an equivalent greenfield.

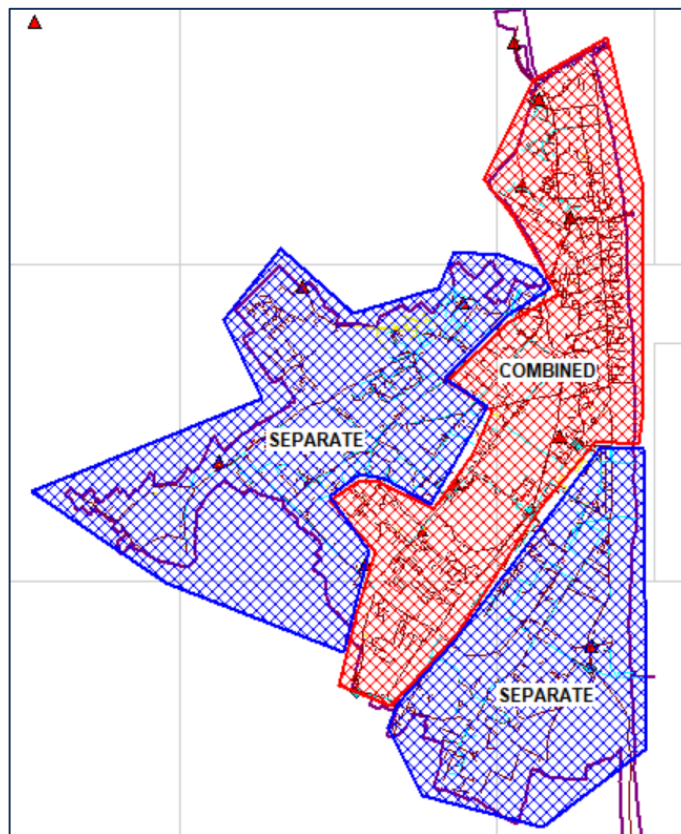


Figure 1: Makeup of the drainage catchments in Deal

There are also some homes that have self-contained sewage systems. They are not connected to the main Deal sewage system at all but have different waste disposal arrangements.

Most new buildings and highways are required to manage their surface water separately, however if too many are connected to the existing sewers or if existing impermeable areas are paved over, then the maximum capacity of the drains, pipes and tank storage can come under strain. Residents have raised concerns about housebuilding, urbanisation, and flooding. This is further addressed in the full technical report.

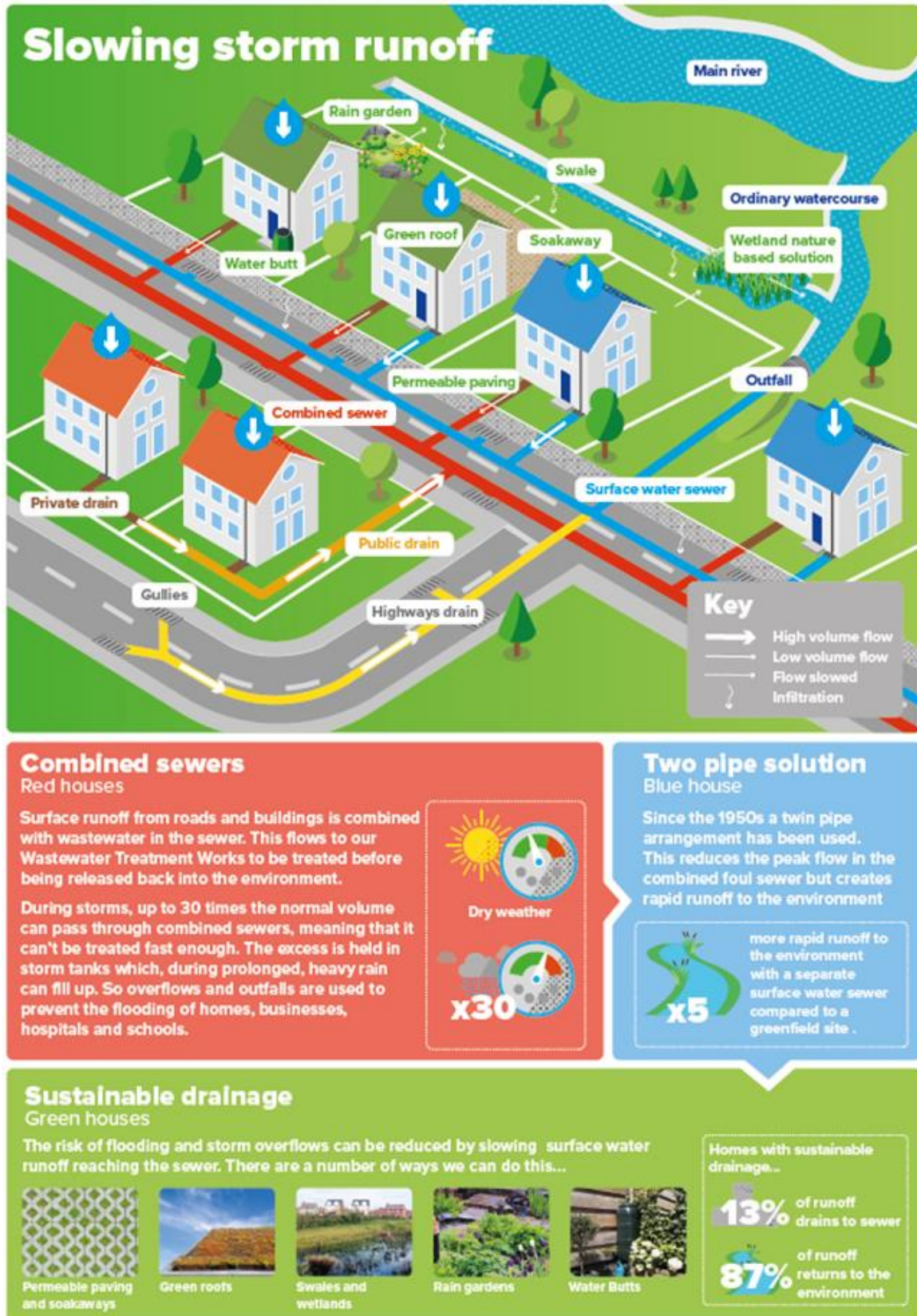


Figure 2: An infographic demonstrating the different scenarios; combined sewers (red roofed houses), the two-pipe solution (blue roofed houses) and the modern sustainable drainage (green roofed houses)

If the sewer network becomes overwhelmed with excess water, then wastewater can be discharged to avoid flooding. This is a last resort measure. This prevents overground flooding of the sewage system but creates unacceptable outcomes in terms of discharges into the sea and to the marine environment.

There is a third system of water management, which has become more prevalent in the 21st Century, called a Sustainable urban Drainage System (SuDS). There is more about this form of rainwater management in the full technical report. Accelerating a move to a SuDS approach is recommended for Deal, particularly across the Combined Sewer areas. Using a SuDS not only separates rainwater flows, but 'slows' and dampens peak flow runoff.

4.0 Why is Albert Road especially affected by flooding?

A central part of the work undertaken by the Taskforce has been to look at the reasons for the persistent flooding in Albert Road.

The management of surface water is complex, particularly in Deal. There are four principal interconnecting areas of work:

- (i) the controls and effectiveness of the combined system (as described above)
- (ii) the resilience and effectiveness of the pumping station at Golf Road together with local drainage flooding structures (ditches and other manmade mitigations)
- (iii) surface water factors, in particular overland flow, inadequate highways drainage and surface water drainage
- (iv) The extent to which changes in the physical environment as well as climate change are impacting on these factors (i) to (iii).

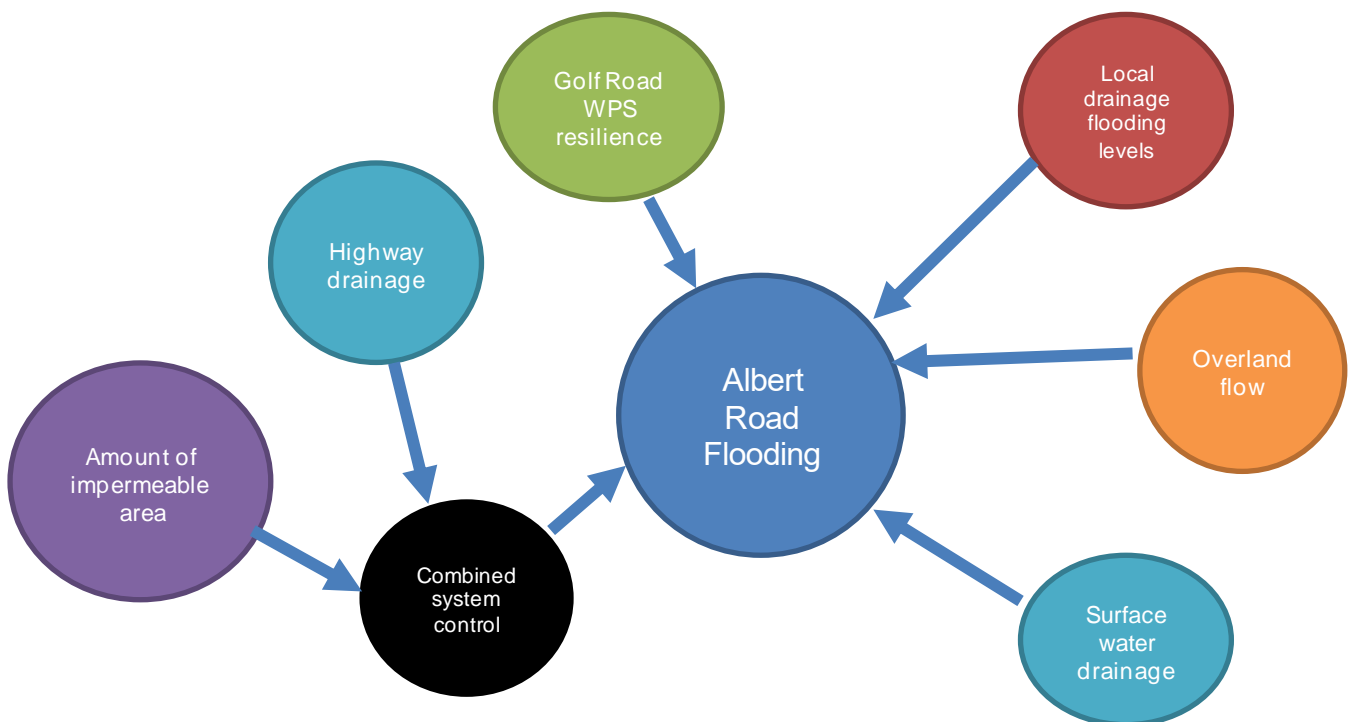


Figure 3: Potential contributors to the flooding issues at Albert Road

Several technical surveys have been undertaken (see the full technical report), together with looking at pictures and descriptions of how flooding has been observed by residents over many years. This resulted in four core questions and actions:

1. What are the drainage issues impacting Albert Road? How do the above ground surfaces drain and the below ground drainage pipes operate, when under stress from weather conditions (e.g. excess rain)?
2. Are there physical reasons for Albert Road to be a pinch point within Deal? i.e. the road layout/housing/building network etc.
3. Is there an emerging capacity constraint in the sewerage system, or an increase in the volume or speed of the water coming into the underground pipes?
4. Are there other factors at work e.g. climate change or changes to the physical environment?

Addressing these in turn:

What are the drainage issues impacting Albert Road?

4.1 How do the above ground surfaces drain, and the below ground drainage pipes operate when under stress from weather conditions (e.g. excess rain)?

Within Albert Road there are combined sewers as set out above, and a surface water sewer that takes road drainage. The combined sewers drain to Golf Road Pumping Station which pumps wastewater to treatment at Weatherlees Wastewater Treatment Works; both the pumping station and treatment works have a facility to discharge stormwater directly out to sea. The facility or activity to discharge stormwater direct to the environment is strictly regulated by the Environment Agency.

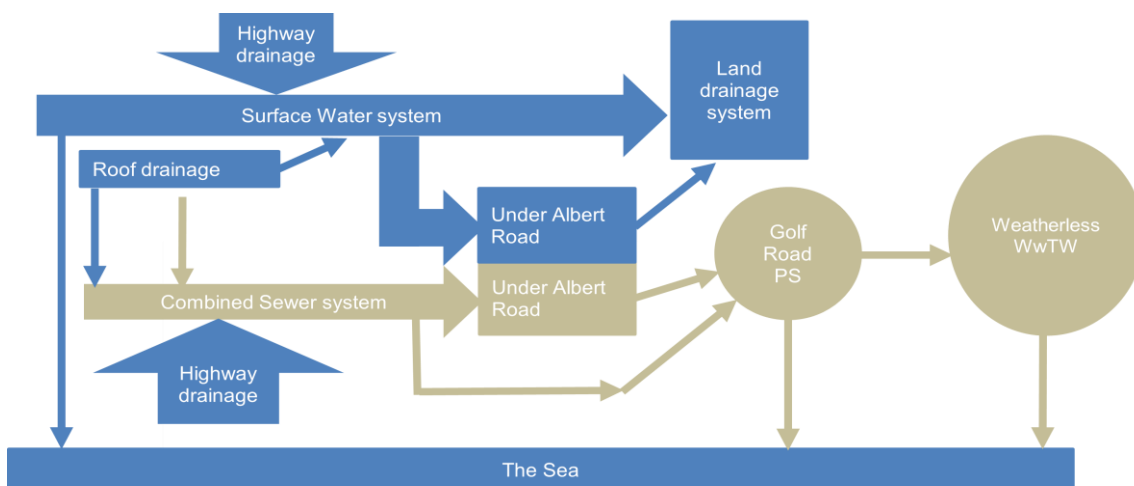


Figure 4: Simplified diagram of the Deal drainage system around Albert Road

In relation to the system in place, several actions were undertaken to explore whether the underground system is working as well as it should or could be, and to consider what else could be done to reduce Albert Road flooding.

First, there have been detailed technical surveys undertaken, together with consideration of detailed suggestions and observations from residents of Albert Road.

This work identified that there were some immediate improvements that could be undertaken to improve performance, to ensure that the system was working in an optimal fashion. There are three key interventions which have been undertaken:

1. The installation of refreshed flaps and valves to aid water flows in the system. This has included a new lighter gauge flap at the 90-degree pipe turn at Albert Road. The 90-degree pipe turn was a specific issue raised by the residents of Albert Road with the taskforce.
2. The installation of new pumps at Golf Road Pumping Station.
3. The cleaning of screens and pipes to reduce the chance of blockages.

Albert Road residents also suggested the taskforce consider the following:

- (i) Increasing the size of the sewer or storage tanks, or add more storage tanks
- (ii) Increasing the pumped capacity

The above suggestions are being actively considered. However, these interventions take a significant amount of time to install, cause significant disruption to the community and the environment, and may not resolve the issue.

There are three significant actions which have been approved, to ensure current infrastructure operates at peak performance during wet weather incidents. These will also improve capacity and performance in the area:

- The installation of high-capacity highway gullies in Albert Road, efficiently removing rainwater runoff from the road to prevent flooding. This action is being undertaken by Kent County Council.
- A new high-capacity pipe in Albert Road to re-direct more surface water away from Albert Road to Matthews Close Dyke, relieving excess water flow in Albert Road itself. This will provide residents with a system capable of dealing with large quantities of rainwater at one time, further alleviating the risk of flooding.
- Improved resilience at Golf Road Pumping Station with additional monitoring instruments and control systems. Modernising the pumping station's six pumps to deal with increased wet weather flow, optimising the asset's capabilities.

4.2 Are there physical reasons for Albert Road to be a pinch point within Deal? (i.e. the road layout/housing/building network etc)?

Detailed mapping work has been undertaken to understand what happens when water flows through Deal, for example during a flash flood where a large volume of water will descend in a short space of time. This detailed mapping work explains how the roads and pathways within Deal act as a 'funnel' – pushing water at pace into Albert Road.

Albert Road appears to be particularly vulnerable as it is one of the lowest physical points in the area before flow is transferred to the Golf Road pumping station. This can be explored looking at the overland flow in more detail. As you can see from Figure 5, the Deal catchment falls to the North East. from the higher red areas to the lower blue areas. Middle Deal Road and London Road continuously slope down to Albert Road where the railway embankment means that Albert Road is the lowest point.

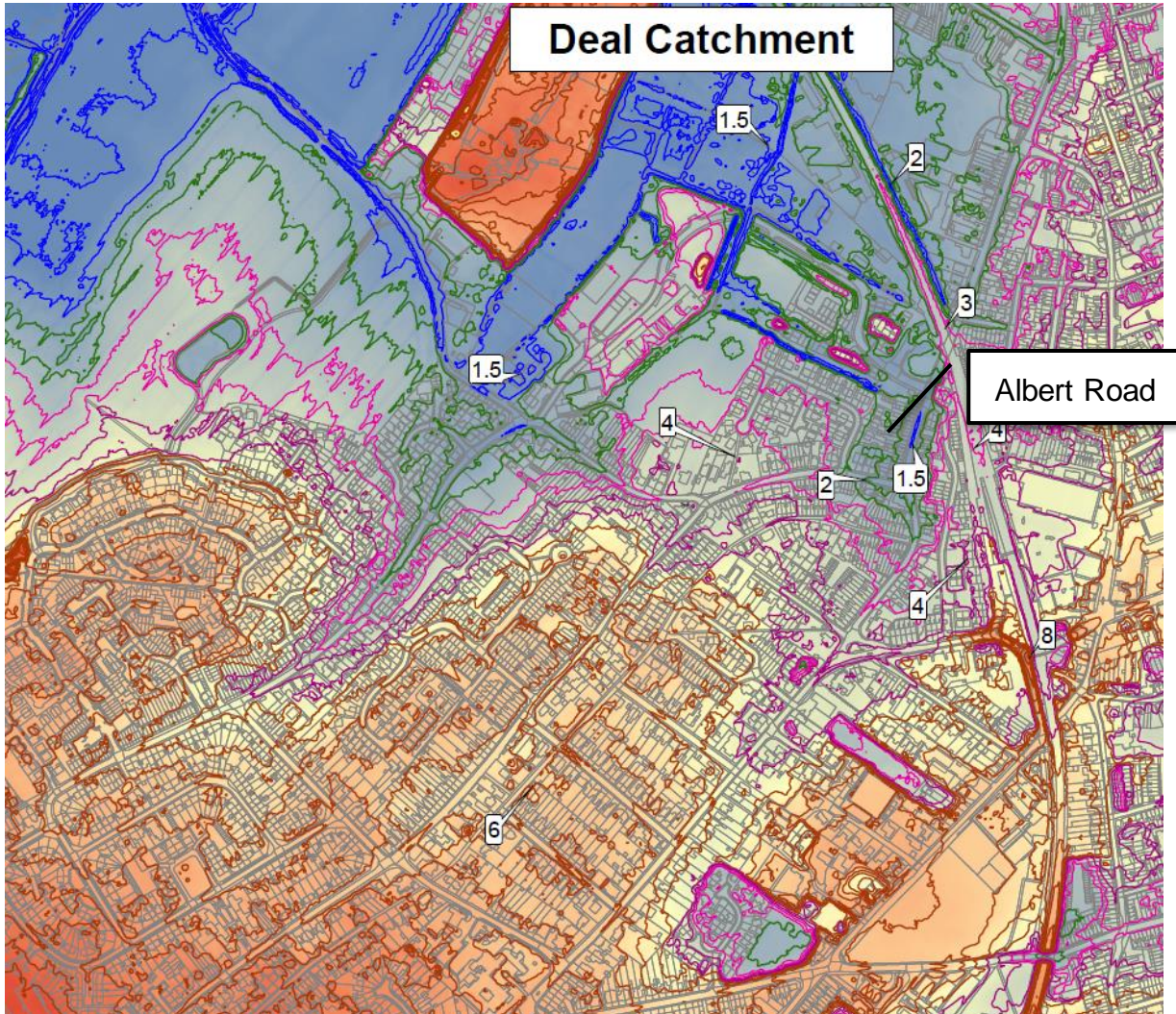


Figure 5: Ground level Contours around Albert Road @1.5m¹

There is also a question of whether, in extreme weather events, there is overland flow down the local roads which could be contributing to the flood water in Albert Road and entering the combined sewers via the manholes, see Figure 6.

¹ 2020 LIDAR Composite model, Environment Agency

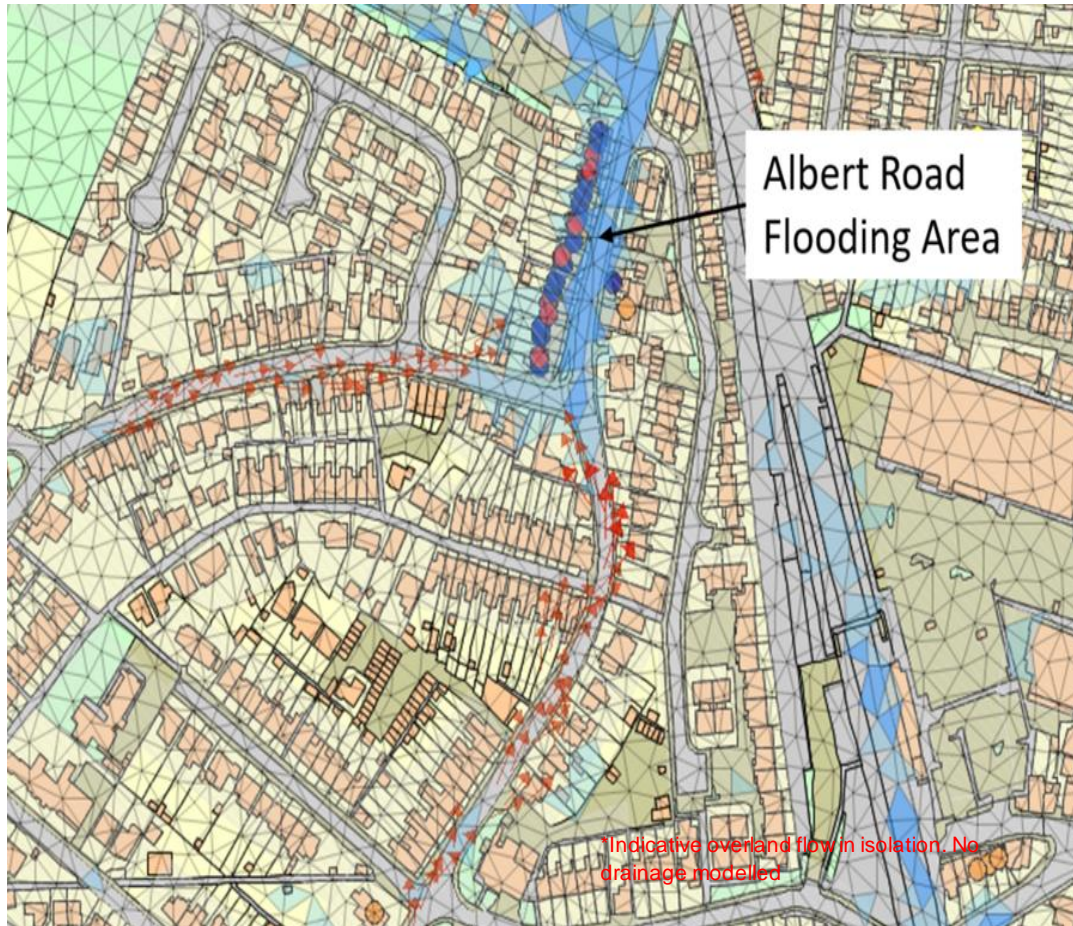


Figure 6: Indicative overland flow routes

We are using a 2-dimensional model to try to understand this. This modelling is at an initial stage, however the early indications show that the neighbouring roads channel overland flow towards Albert Road. For this early modelling we have assumed a scenario where the existing surface water drainage systems are either at capacity or unavailable due to blockage.

This model will be critical to understanding the impact of short intense storms, like the August 2020 and July 2021 events. These types of events can overwhelm the local surface water sewers and are likely to become more frequent due to climate change.

Work has been undertaken to look at the overland water flows throughout Deal and to consider whether anything can be done to slow or divert water from funnelling to Albert Road.

This has resulted in two clear recommendations:

- (a) Installing new and deep gullies in Albert Road to direct water flow away from houses .
- (b) To pilot methods to slow the flow of rainwater in the roads which the modelling suggest act as a particular accelerator or funnel. This work will take part in two stages. The first part is to trial 'slow the flow' measures at residential homes. These roads will be contacted shortly to discuss the initial deployment of water butts and planters.

4.3 Is there an emerging capacity constraint in the sewage system, or an increase in the volume or speed of the water coming into the underground pipes? And are there other factors at work e.g. climate change?

Albert Road wastewater can freely drain to Golf Road Pumping station. However, it is also the case that **all wastewater flows** from the Deal combined sewers drain freely to Golf Road Pumping station, which has a limited pass forward capacity. The continued building of impermeable areas, known as urban creep, combined with climate change whereby we are likely to get more shorter intense rainfall events, creates more pressure on the system, which is increasingly more difficult to manage.

The factors that have contributed to this are not simply the number of new homes in the area, as generally these new homes incorporate SuDS as standard. Over time, it is the physical changes to the towns and urban ‘hard’ landscape which increases both the volume and pace of flow of water through the town and to Albert Road.

A significant problem remains where much of the ground in the area is covered by hard surfaces. The ideal situation would be to encourage the use of sustainable drainage (SuDS) solutions such as permeable paving, green roofs, and rain gardens. This would reduce the peak volume of water entering the sewer system (see figure 7). Using sustainable infrastructure to slow the flow of water reduces the frequency of peak flow conditions. It is adaptable, sustainable and can improve a sense of place. For these reasons, the Deal-WAT wants to encourage the use of sustainable and nature-based solutions where possible.

Storm runoff comparison

Based on a 200m³ area

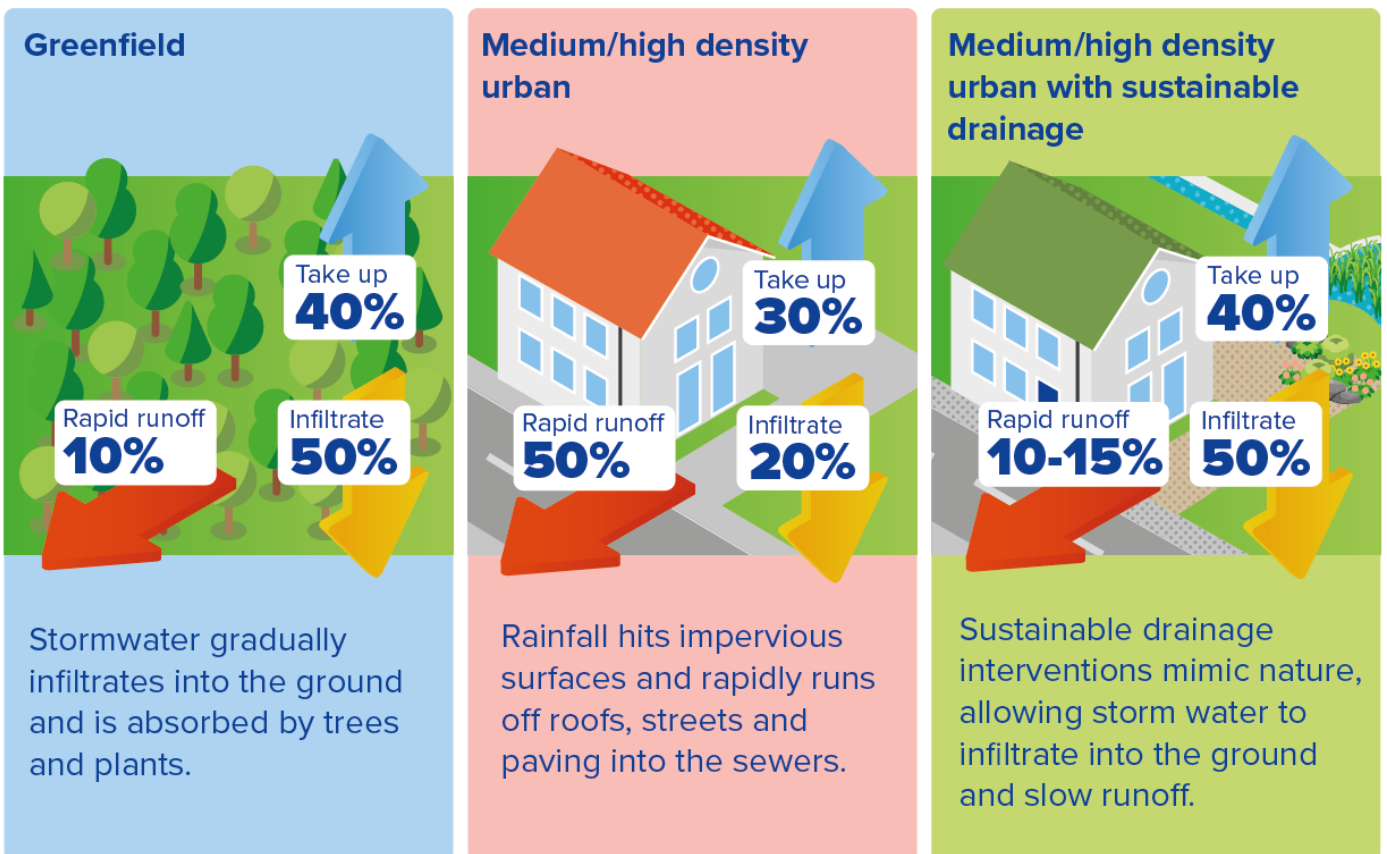


Figure 7: An infographic showing the comparison of storm water runoff

These improvements will increase the effectiveness and resilience of the existing road and sewage system. However, more needs to be done to address the increased urbanisation of the physical landscape to allow for more natural absorption of rainwater.

Recommendations for this will involve a broader footprint than the Albert Road area. These more extensive measures will be vital in making significant progress towards eliminating sea discharge:

- Trialling slow-the-flow measures on streets and working with larger premises such as schools.
- Designing new measures to improve the capacity in the sewer system.
- Installing additional monitoring instruments and control systems to improve resilience across the area.
- Evaluation of the success of the 'slow-the-flow' measures with residents and further roll out.

5.0 Flood Warnings and Alerts

As part of the response instigated through the taskforce's work, dedicated flood response support by Southern Water for the residents of Albert Road. It is recognised that the regularity of flood warnings and alerts is a source of additional anxiety for Albert Road residents.

The trigger points and actions have been considered as part of this work and there will continue to be discussions with Albert Road residents about the activation of these, and to ensure that they have urgent support and assistance if and when flooding occurs.

6.0 Next steps

The work undertaken by the Deal Water Action Taskforce to date has been collaborative and the taskforce's work will be extended by a further 6-9 months in order to implement, monitor and assess the steps outlined in this paper.

The Deal-WAT plans to host events locally and continue engaging with the local community about what is happening on the Deal pathfinder project and how to get involved in piloting and trialling the new approaches.

A full copy of the [technical report](#) can be downloaded from our website.

The report sets out a range of potential interventions that could be implemented to alleviate the flooding in Deal. While some actions can be implemented immediately, some will require design and procurement time or trialling.



"This report is only the start of the journey towards a sustainable and resilient drainage system in Deal. We will continue to work with partners to identify and deliver opportunities for improvement and plan together for the sustainable growth of the town of Deal."



“We ask our partners and the local community to continue to support that journey, with photos and data, ideas and enthusiasm, so that together we can agree how decisions can be made for our mutual benefit.”

Dr Nick Mills, Head of Southern Water’s Storm Overflow Task Force

7.0 Get in touch

You can also find out more about what Southern Water is doing to reduce the use of storm overflows across the region at [Storm Overflows \(southernwater.co.uk\)](https://www.southernwater.co.uk/storm-overflow) or on our social media channels:

- Twitter - twitter.com/SouthernWater
- Facebook - facebook.com/SouthernWater

If you have any questions or want to get in touch with us, please email: Nicole.mcnab@southernwater.co.uk

Or contact the Office of Natalie Elphicke MP: office.natalie.elphicke.mp@parliament.uk



Figure 8: Meeting with Albert Road residents May 2022