Drainage and Wastewater Management Plan

Broomfield Bank
Wastewater System Plan

from Southern Water

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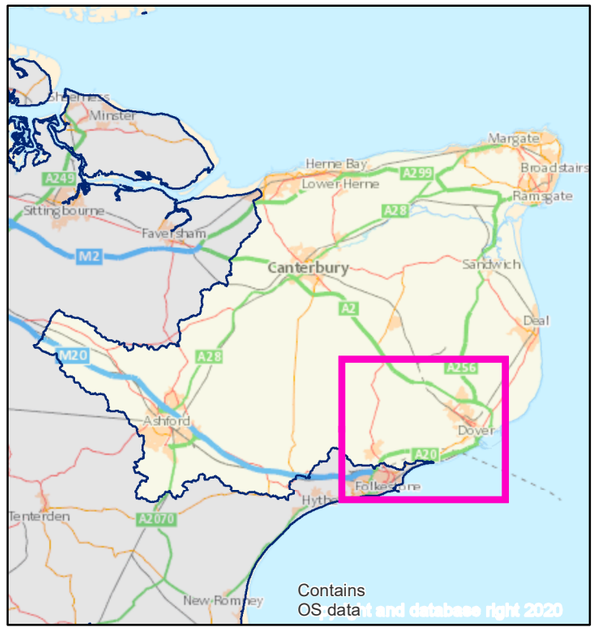
Broomfield Bank wastewater system: map and key facts



Population Equivalent (PE)	**114,249**
Discharge Waterbody	**Long sea outfall into English Channel**
Number of Pumping Stations	**51**
Number of Overflows	**19**
Length of Sewer (km)	**867.6**
Catchment Reference	**BROM**

BRAVA Results Table

	Planning Objective	2020	2050
1	Internal Sewer Flooding Risk	1	
2	Pollution Risk	2	
3	Sewer Collapse Risk	0	
4	Risk of Sewer Flooding in a 1 in 50 year storm	1	1
5	Storm Overflow performance	1	1
6	Risk of WTW Compliance Failure	2	2
7	Risk of flooding due to Hydraulic Overload	0	0
8	Dry Weather Flow Compliance	0	0
9	Good Ecological Status / Potential	2	
10	Surface Water Management	1	
11	Nutrient Neutrality	NA	NA
12	Groundwater Pollution	2	
13	Bathing Waters	0	
14	Shellfish Waters	NA	

Catchment Strategy: IMPROVE

Drivers of Risks

- Customer
- Hydraulics
- Operational
- Quality
- Unknown

BROOMFIELD BANK WTW

0 0.5 1 2 3 4 Kilometers

Problem Characterisation

Broomfield Bank (BROM)

This document describes the causes of the risks identified by the Baseline Risk and Vulnerability Assessment (BRAVA). The BRAVA results for this catchment are summarised in Table 1. The results indicate that flooding, pollution and water quality are the main concerns in this wastewater catchment. We have completed risk assessments for 2050 where we have the data and tools available to do so. For the other planning objectives, we will explore how we can predict future risks for the next cycle of DWMPs. All the risk assessment methods need to be reviewed after the first DWMPs have been produced with a view to improve the methods and data for future planning cycles.

Table 1: Results of the BRAVA for Broomfield Bank wastewater system

Planning Objectives		2020	Driver	2050
1	Internal Sewer Flooding Risk	1	Customer	
2	Pollution Risk	2	Operational	
3	Sewer Collapse Risk	0	-	
4	Sewer Flooding in a 1 in 50-year storm	1	Hydraulic	1
5	Storm Overflow Performance	1	Hydraulic	1
6	WTW Water Quality Compliance	2	Operational	2
7	Flooding due to Hydraulic Overload	0	-	0
8	WTW Dry Weather Flow Compliance	0	-	0
9	Good Ecological Status / Good Ecological Potential	2	Operational	
10	Surface Water Management	1	Hydraulic	
11	Nutrient Neutrality	NA	-	NA
12	Groundwater Pollution	2	Operational	
13	Bathing Waters	0	-	
14	Shellfish Waters	NA	-	

Key

BRAVA Risk Band	
NA	Not Applicable*
0	Not Significant
1	Moderately Significant
2	Very Significant

*No issues relevant to planning objective within Wastewater System

Catchment Investment Strategy

The risks identified in this wastewater catchment mean that we have assigned the following investment strategy:

Improve

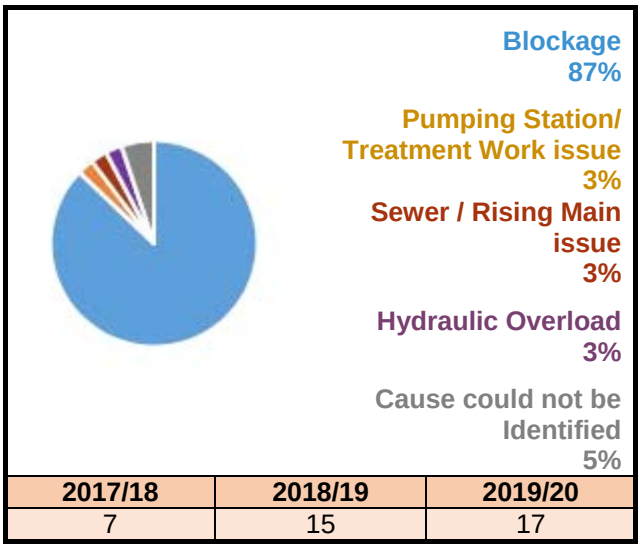
This means that we consider that the current performance of the drainage and wastewater system needs to be improved to reduce the impacts on our customers and/or the environment. We will plan investment to reduce the current risks by actively looking to invest capital funding in the short term to address current performance issues (and consider future risks when implementing improvements).

Planning Objective 1: Internal Sewer Flooding Risk

The number of internal sewer flooding incidents reported during the three years considered by the risk assessment are shown in Figure 1. The total number of connections in this wastewater system means there have been between 1.68 and 3.35 incidents per 10,000 connections per year (a threshold set by Ofwat) so the risk is in the 'moderately significant' band.2

The primary driver for internal sewer flooding in this wastewater system is 'Customer'. Blockages caused 87% of all incidents recorded in this wastewater system. Blockages are often caused by fats, oils, grease, nappies, wet wipes and sanitary products within the system. These items are non-flushable and should not be disposed of into wastewater systems.

Figure 1: Number of internal flooding incidents per annum and causes



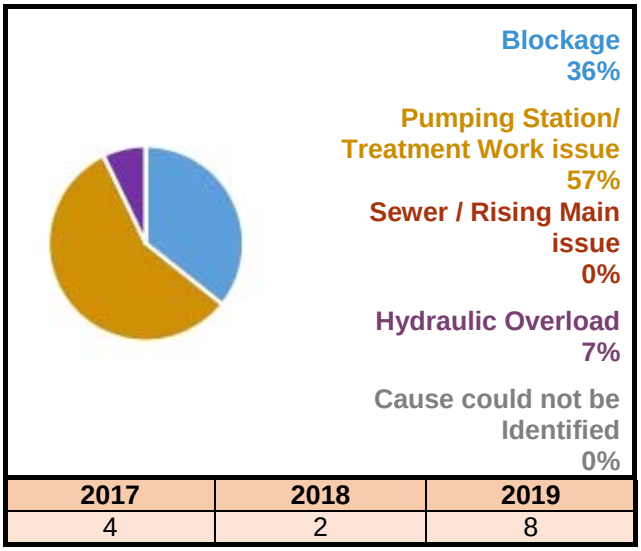
2017/18	2018/19	2019/20
7	15	17

Planning Objective 2: Pollution Risk

The number of pollution incidents reported during the three years considered by the risk assessment are shown in Figure 2. The length of sewer in this wastewater system means there have been more than 49.01 incidents per 10,000km per year (a threshold set by Ofwat) so the risk is in the 'very significant' band.

The primary driver for pollution is 'Operational' due to asset operational issues. Asset operational issues at our pumping stations and treatments works are the main cause of incidents, contributing to 57% of all incidents recorded in this wastewater system.

Figure 2: Number of pollution incidents per annum and causes



2017	2018	2019
4	2	8

Planning Objective 3: Sewer Collapse Risk

The number of sewer collapses reported during the three years considered by the risk assessment are shown in Table 2. The length of sewer in this wastewater system means there have been less than 5.72 incidents per 1,000km per year (a threshold set by Ofwat) so the risk is in the 'not significant' band.

Table 2: Sewer collapses and rising main bursts

Sewer Collapse	**2017/18**	3
	2018/19	5
	2019/20	3
Rising Main Bursts	**2017/18**	0
	2018/19	2
	2019/20	0

Planning Objective 4: Sewer Flooding in a 1 in 50 Year Storm

The risk of flooding in a 1 in 50 year storm is moderately significant in 2020 and 2050. This is because our computer model of the sewer network indicate for 2020 that approximately 2300 - 2400 properties within this wastewater system are in areas that could flood by water escaping from sewers. This model prediction increases the number of properties in areas at risk from flooding to approximately 3700 - 3800 by 2050.

Our wastewater networks are generally designed with capacity for up to a 1 in 30 year storm, hence flooding is expected to occur during more severe storms such as a 1 in 50 year event. Flooding will occur due to insufficient capacity of the drainage system either on the surface before it enters the drainage system, and/or from manholes, in people's homes or at a low point elsewhere in the system.

Planning Objective 5: Storm Overflow Performance

The storm overflow performance risk has been assessed as moderately significant in 2020 and 2050. Table 3 shows the overflows that discharge above the low threshold set for storm overflow discharges to Shellfish Water, Bathing Water and inland rivers.

The numbers for the 2050 assessment may be lower than the 2020 assessment. This is because the 2050 figures are predicted from modelling, whereas the 2020 figures are based on actual recorded data and include spills due to blockages or operational issues which cannot be forecast into the future.

The primary driver for the Storm Overflow Performance is 'Hydraulic.'

Table 3: Overflows exceeding discharge frequency threshold per annum

	Number of overflows		Threshold for number of discharges per annum		
	2020	2050	Low	Medium	High
Shellfish Waters	0 Medium	0 Medium	Less than 8	Between 8-10	10 or more
Bathing Waters	3 Medium	2 Medium	Less than 3	Between 3-10	10 or more
Freshwater	0 Medium	0 Medium	Less than 20	Between 20-40	40 or more

Planning Objective 6: Wastewater Treatment Works Water Quality Compliance

The risk of non-compliance with our wastewater quality permit has been assessed as very significant for both 2020 and 2050. This is because the compliance status of the wastewater treatment works in 2020 was Fail. It was also assessed to not have adequate capacity to cope with future growth in the wastewater system.

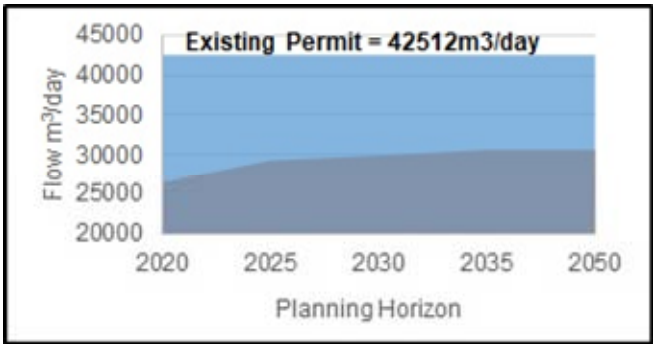
Planning Objective 7: Flooding due to Hydraulic Overload

Our initial assessment is that flooding from hydraulic overload is not significant in this wastewater catchment for both 2020 and 2050. We will use a hydraulic model of the wastewater system to determine if this catchment is at risk for Hydraulic Overload across the various storm events, and update this risk assessment accordingly for the next cycle of DWMPs.

Planning Objective 8: Wastewater Treatment Works Dry Weather Flow Compliance

The risk of Wastewater Treatment Works Dry Weather Flow (DWF) Compliance is not significant for both 2020 and 2050. This is because the average annual DWF for 2017, 2018 and 2019 has been below 80% of the current permit. The predicted DWF in 2050 is also expected to remain below 80% of the current permit, shown in Figure 3.

Figure 3: Recorded and predicted dry weather flow with existing permit



Planning Objective 9: Good Ecological Status / Good Ecological Potential

Table 4: Waterbody not achieving GES/GEP

Waterbody	Classification	EA-Status	Activity
East Kent Chalk - Stour	Chemical Drinking Water Protected Area	Poor	Leaking utility sewers

Table 4 shows the waterbody connected to this wastewater catchment is not achieving Good Ecological Status or Potential (GES/GEP). The Environment Agency has attributed the 'reasons for not achieving good status' to water company operations. Our risk assessment has been assessed based on the worst assigned status (Poor) and is very significant. This is because there are potential issues with leaking sewers allowing the sewerage to escape into the ground due to the condition of our sewer network in this wastewater system.

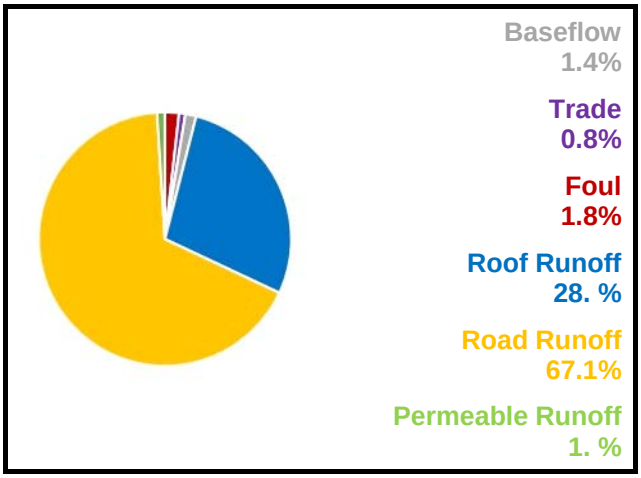
The primary driver is 'Operational'.

Planning Objective 10: Surface Water Management

Our initial high level assessment indicated that there is moderately significant interaction between surface water flooding and flooding from sewers in this wastewater system.The cause of this localised flooding is the capacity of the drainage network in these areas to convey both wastewater and surface water run-off.

Figure 4 illustrates the sources of water flowing in the wastewater system during a 1 in 20 year storm. It shows that surface water runoff from roofs, road and permeable surfaces constitutes more than 96.1% of the flow in the sewers. The total contribution of foul water from homes is 1.8% with business contributing 0.8%. The baseflow is infiltration from water in the ground and makes up 1.4% of the flow in the system.

Figure 4: Sources of water flowing in sewers during a 1 in 20 year storm



Planning Objective 11: Nutrient Neutrality

This wastewater system is not hydraulically linked to Habitat Sites noted as under threat by Natural England.

Planning Objective 12: Groundwater Pollution

The risk of Groundwater Pollution is very significant. The wastewater system network of sewers extends across geographical areas that are designated as a Source Protection Zone (SPZ) for water supply. Sewer survey data indicates that parts of the sewer network are in poor condition and are likely to leak sewage.

The primary driver is 'Operational' due to condition of our assets.

Planning Objective 13: Bathing Waters

The designated bathing waters that could be affected by discharges from this wastewater system are shown in Table 5, along with the current classification from the Environment Agency. The risks from this wastewater system on these bathing waters is not significant. This is because all the designated bathing waters affected by this wastewater system have passed annual inspections..

Table 5: Bathing Water annual results

Bathing Waters	Annual Results		
	2017	2018	2019
Folkestone	Excellent	Excellent	Good
St Margaret`s Bay	Excellent	Excellent	Excellent

Planning Objective 14: Shellfish Waters

The discharges from this wastewater system do not impact on any designated shellfish waters.

Generic Options Assessment for: Broomfield Bank (BROM)

Planning Objectives		2020	Driver	2050
PO1	Internal Flooding	1	Customer	-
PO2	Pollution Risk	2	Operational	-
PO3	Sewer Collapse	0	-	-
PO4	Risk of Sewer Flooding in 1 in 50 yr	1	Hydraulic	1
PO5	Storm Overflow Performance	1	Hydraulic	1
PO6	Risk of WTW Compliance Failure	2	Operational	2
PO7	Annualised Flood Risk/Hydraulic Overload	0	-	0
PO8	DWF Compliance	0	-	0
PO9	Achieve Good Ecological Status	2	Operational	-
PO10	Improve Surface Water Management	1	Hydraulic	-
PO11	Secure Nutrient Neutrality	NA	-	NA
PO12	Reduce Groundwater Pollution	2	Operational	-
PO13	Improve Bathing Water Quality	0	-	-
PO14	Improve Shellfish Water Quality	NA	-	-

Type of Measures	Generic Option Categories	Icon	Take Forward?	Reasons	Examples of Generic Options
Source (Demand) Measures (to reduce likelihood)	Control / Reduce surface water run-off		Y	-	Natural Flood Management; rural land management and catchment management; SuDS including blue and green infrastructure; storm management
	Reduce groundwater levels		N	Reducing groundwater levels would reduce the risks from infiltration into the network. However, in practice, reducing groundwater levels will be detrimental to the environment, ground conditions and is prohibitively too costly to implement. For these reasons, this generic option has been discounted.	Reduce leakage from water supply pipes; pump away schemes to locally lower groundwater near sewer network
	Improve **quality** of wastewater		Y	-	Domestic and business customer education; incentives and behaviour change (reduce Fats, Oils & Grease, wet wipes etc.); monitoring trade waste at source; on-site black water and/or greywater pre-treatment
	Reduce the **quantity** / demand		Y	-	Water efficient appliances; water efficient measures; blackwater and/or greywater re-use; treatment at source
Pathway (Supply) Measures (to reduce likelihood)	Network Improvements		Y	-	Asset optimisation; additional network capacity; storage; separate flows; structural repairs; re-line sewer pipe and manholes; smart networks.
	Improve Treatment Quality		Y	-	Increase treatment capacity; rationalisation of treatment works (centralisation / de-centralisation); install tertiary plant; UV plant or disinfection facilities; innovation; improve Technical Achievable Limits; new WTWs
	Wastewater Transfer to treatment elsewhere		Y	-	Transfer flow to other network or treatment sites; transport sewage by tanker to other sites
Receptor Measures (to reduce consequences)	Mitigate impacts on Air Quality		N/A	Not included in first round of DWMPs	Carbon offsetting; noise suppression /filtering; odour control and treatments
	Improve Land and Soils		N/A	Not included in first round of DWMPs	Sludge soil enhancement
	Mitigate impacts on receiving waters		Y	-	River enhancement, aeration
	Reduce impact on properties		Y	-	Property flood resilience; non-return valves; flood guards / doors; air brick covers
Other	Study / Investigation		Y	-	Additional data required; hydraulic model development; WQ monitoring and modelling

August 2021
Version 1

Broomfield Bank Wastewater System - Outline Options Appraisal

Generic Option	Location of Risk	Planning Objective and Description of Risk	Option Reference	Description	Further Description	Unconstrained Option?	Constrained Option?	Feasible Option?	Net Benefits	Estimated Cost	Preferred Option	Best value / Least cost or Reasons for Rejection
Control/ Reduce surface water entering the sewers	Flooding Cluster BROM FC01 - Boston Close Dover	PO4 and PO7 Flooding	BROM.SC01.1	Surface Water Separation and SuDS for Storage	DAP Option.	No						
Control/ Reduce surface water entering the sewers	Flooding Cluster BROM FC02 - Crabble Dover	PO4 and PO7 Flooding	BROM.SC01.2	Surface Water Separation and SuDS for Storage	DAP Option.	No						
Control/ Reduce surface water entering the sewers	Flooding Cluster BROM FC03 - Canterbury Road Folkstone	PO4 and PO7 Flooding	BROM.SC01.3	Surface Water Separation and SuDS for Storage	DAP Option.	No						
Control/ Reduce surface water entering the sewers	Flooding Cluster BROM FC04 - Wear Bay Road Folkestone	PO4 and PO7 Flooding	BROM.SC01.4	Surface Water Separation and SuDS for Storage	DAP Option.	No						
Control/ Reduce surface water entering the sewers	Flooding Cluster BROM FC05 - The Leas / Westbourne Gardens Folkestone	PO4 and PO7 Flooding	BROM.SC01.5	Surface Water Separation and SuDS for Storage	DAP Option.	No						
Control/ Reduce surface water entering the sewers	Flooding Cluster BROM FC06 - High Street / The Esplanade Sandgate	PO4 and PO7 Flooding	BROM.SC01.6	Surface Water Separation and SuDS for Storage	DAP Option.	No						
Control/ Reduce surface water entering the sewers	Flooding Cluster BROM FC07 - Morehall / Coolinge Folkestone	PO4 and PO7 Flooding	BROM.SC01.7	Surface Water Separation and SuDS for Storage	DAP Option.	No						
Control/ Reduce surface water entering the sewers	Flooding Cluster BROM FC08.1 - Hawkinge	PO4 and PO7 Flooding	BROM.SC01.8	Surface Water Separation and SuDS for Storage	DAP Option.	No						
Control / Reduce groundwater infiltration												
Improve quality of wastewater entering sewers (inc reducing FOG, RAG, pre-treatment, trade waste)	Catchment Wide	PO1- Internal Flooding	BROM.SC03.1	Customer Education Programme	Target both domestic and business customers.	Yes	Yes	Yes	Minor Positive +	£115K	Yes	Best Value
Improve quality of wastewater entering sewers (inc reducing FOG, RAG, pre-treatment, trade waste)	Catchment Wide	PO2- Pollution Risk	BROM.SC03.2	Customer Education Programme	Target both domestic and business customers.	Yes	Yes	Yes	Minor Positive +	£115K	Yes	Best Value
Control / Reduce the quantity / flow of wastewater entering sewer system												
Network Improvements (eg increase capacity, storage, conveyance)	THE STADE FOLKESTONE WPS	PO1- Internal Flooding	BROM.PW01.1	Maintenance Programme WPS	An efficient maintenance programme for pumping stations and/Treatment works.	No						Risk and uncertainty - future resilience
Network Improvements (eg increase capacity, storage, conveyance)	Downs Road	PO1- Internal Flooding	BROM.PW01.2	Additional Storage	Additional Storage.	No						Risk and uncertainty - future resilience
Network Improvements (eg increase capacity, storage, conveyance)	Folkestone Junction WPS	PO2- Pollution Risk	BROM.PW01.3	Maintenance Programme WPS	An efficient maintenance programme for pumping stations to elimate the risk of a pollution incident due to an operational failure.	Yes	Yes	Yes	Minor Positive +	£465K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	Elizabeth Street Dover WPS	PO2- Pollution Risk	BROM.PW01.4	Maintenance Programme WPS	An efficient maintenance programme for pumping stations to elimate the risk of a pollution incident due to an operational failure.	Yes	Yes	Yes	Minor Positive +	£465K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	FOLKESTONE JUNCTION WPS	PO2- Pollution Risk	BROM.PW01.5	Additional Storage	Convetional storage tank.	No						Risk and uncertainty - future resilience
Network Improvements (eg increase capacity, storage, conveyance)	Flemings- Outer Zone TCZ Martin Mill- Outer Zone TCZ Woodensborough- Outer Zone TCZ Sutton- TCZ Martins Gorse- TCZ Ringwould- TCZ	PO9 and PO12- Ground Water Pollution	BROM.PW01.6	Pipe Rehabilitation Programme	Total length of sewer within protection zones- 207.	Yes	Yes	Yes	Minor Positive +	£14,100K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	Catchment Wide	PO1- Internal Flooding	BROM.PW01.7	Jetting Programme	Improved targeting and frequency of sewer jetting under MST (maintenance scheduled tasks) programme.	Yes	Yes	Yes	Minor Positive +	£390K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	Catchment Wide	PO2- Pollution Risk	BROM.PW01.8	Jetting Programme	Improved targeting and frequency of sewer jetting under MST (maintenance scheduled tasks) programme.	Yes	Yes	Yes	Minor Positive +	£55K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	Flooding Cluster BROM FC01 - Boston Close Dover	PO4 and PO7 Flooding	BROM.PW01.9	Storage Tank	DAP Option.	Yes	Yes	Yes	Major Positive +++	£1,105K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	Flooding Cluster BROM FC02 - Crabble Dover	PO4 and PO7 Flooding	BROM.PW01.10	Storage Tank	DAP Option.	Yes	Yes	Yes	Major Positive +++	£810K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	Flooding Cluster BROM FC03 - Canterbury Road Folkstone	PO4 and PO7 Flooding	BROM.PW01.11	Storage Tank	DAP Option.	Yes	Yes	Yes	Major Positive +++	£710K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	Flooding Cluster BROM FC04 - Wear Bay Road Folkestone	PO4 and PO7 Flooding	BROM.PW01.12	Storage Tank	DAP Option.	Yes	Yes	Yes	Major Positive +++	£2,475K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	Flooding Cluster BROM FC05 - The Leas / Westbourne Gardens Folkestone	PO4 and PO7 Flooding	BROM.PW01.13	Storage Tank	DAP Option.	Yes	Yes	Yes	Major Positive +++	£720K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	Flooding Cluster BROM FC06 - High Street / The Esplanade Sandgate	PO4 and PO7 Flooding	BROM.PW01.14	Storage Tank	DAP Option.	Yes	Yes	Yes	Major Positive +++	£1,075K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	Flooding Cluster BROM FC07 - Morehall / Coolinge Folkestone	PO4 and PO7 Flooding	BROM.PW01.15	Storage Tank	DAP Option.	Yes	Yes	Yes	Major Positive +++	£1,910K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	Flooding Cluster BROM FC08.1 - Hawkinge	PO4 and PO7 Flooding	BROM.PW01.16	Storage Tank	DAP Option.	Yes	Yes	Yes	Major Positive +++	£570K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	ELIZABETH STREET DOVER WPS	PO5 - Storm Overflow Performance	BROM.PW01.17	Storage Tank	Convetional storage tank.	Yes	Yes	Yes	Minor Positive +	£1,000K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	FOLKESTONE JUNCTION WPS	PO5 - Storm Overflow Performance	BROM.PW01.18	Storage Tank	Convetional storage tank.	Yes	Yes	Yes	Minor Positive +	£1,000K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	THE STADE FOLKESTONE WPS	PO5 - Storm Overflow Performance	BROM.PW01.19	Storage Tank	Convetional storage tank.	Yes	Yes	Yes	Minor Positive +	£1,000K	Yes	Best Value
Improve treatment (capacity and quality at existing works or develop new WTWs)	BROOMFIELD BANK WTW	PO2- Pollution Risk	BROM.PW02.1	Maintenance Programme WTW	An efficient maintenance programme.	Yes	Yes	Yes	Minor Positive +	£6,970K	Yes	Best Value
Improve treatment (capacity and quality at existing works or develop new WTWs)	BROOMFIELD BANK WTW	PO6 (2050)- WTW compliance	BROM.PW02.2	Increase WTW Treatment Capacity	Catchment was banded 2 in 2020 ; EPR failure.	Yes	Yes	Yes	Minor Positive +	£TBC - With Partners	Yes	Best Value
Wastewater Transfer												

Broomfield Bank Wastewater System - Outline Options Appraisal

Generic Option	Location of Risk	Planning Objective and Description of Risk	Option Reference	Description	Further Description	Unconstrained Option?	Constrained Option?	Feasible Option?	Net Benefits	Estimated Cost	Preferred Option	Best value / Least cost or Reasons for Rejection
Mitigate impacts on Air Quality (e.g. Carbon neutrality, noise, odour)												Not included in the first round of DWMPs
Improve Land and Soils												Not included in the first round of DWMPs
Mitigate impacts on Water Quality												
Reduce consequences Properties (e.g. Property Flood Resilience)	Downs Road	PO1- Internal Flooding	BROM.RC04.1	Property Flood Mitigation / Resistance	Short-term property level protection ahead of flood alleviation scheme - Non-return valves and flood mitigation doors / gates.	No						Technically feasibleCost EffectiveDeliver the required outcomeEnvironmental risk mitigatableDo customer support itRisk and uncertainty - future resilience
Study/ investigation to gather more data	London Street, London Road	PO1- Internal Flooding	BROM.OT01.1	Investigation into causes	Investigation into causes.	No						Deliver the required outcome
Study/ investigation to gather more data	East Kent Chalk - Stour	PO9- GE Status / Potential	BROM.OT01.2	Study and Investigations to Achieve Good Ecological Status	Catchment was banded 2 in because; East Kent Chalk - Stour-Chemical Drinking Water Protected Area (Poor Leaking utility sewers).	Yes	Yes	Yes	Minor Positive +	£695K	No	Best Value
Study/ investigation to gather more data	Catchment Wide	PO1- Internal Flooding (hydraulic causes) PO4- 1 in 50 year Flood Risk PO5- Storm Overflow PO10- Surface Water Management	BROM.OT01.3	Improve Hydraulic Model	Hydraulic surveys and reverification.	Yes	Yes	Yes	Minor Positive +	£375K	Yes	Best Value
Study/ investigation to gather more data	Flooding Cluster BROM FC08.2 - Hawkinge	PO4 and PO7 Flooding	BROM.OT01.4	Study and modelling Investigation	DAP Option.	No						

DWMP Investment Needs

1. The options listed in the DWMP Investment Needs below are the preferred options in our DWMP. They will need further refinement as we implement the DWMP to confirm the exact location and scope of action needed, and the cost.

2. The costs are indicative costs for planning purposes only. The basis for the cost estimates, including assumptions and uncertainties, are explained in our DWMP Investment Plans.

3. The table of Investment Need provides an indicative cost so we know what level of funding is needed to reduce the risks. It is not a commitment to fund or deliver any option.

4. The Indicative Timescale is when the investment is needed. Some options may take several investment periods to achieve the desired outcomes.

5. Potential Partners have been identified in the table of Investment Needs. This is to indicate where there may be opportunities for us to work with these partners when developing and delivering these options. It is not a commitment by any of the partners to work with us.

6. These options will inform our future business plans as part of the Ofwat periodic review process to secure the finance to implement these options.

7. The options listed are prioritised by the method stated in the Programme Appraisal Technical Summary.

Date : May 2023
Version : 1.0

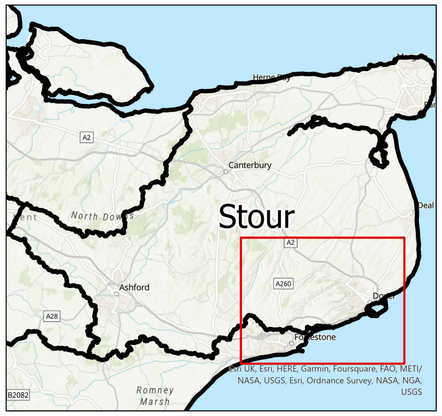
Reference	River Basin (L2)	Wastewater System (L3)	Location	Option	Indicative Cost	Indicative Timescales	Potential Partners	Applicable Planning Objectives
Stour								
Broomfield Bank								
BROM.SC03.1	Stour	Broomfield Bank	St. James Lane, The Bayle, Castle Street, London Street, Bench Street, Norman Street, Sandgate Road, Oswald Road, Snargate Street,	Customer Education Programme: Targeted campaign to reduce the amount of FOG (fats, oils and grease) and unflushables discharged into the sewer network	£115K	AMP8 onwards	Folkestone and Hythe District Council, Dover District Council	PO1
BROM.SC03.2	Stour	Broomfield Bank	System Wide	Customer Education Programme: Targeted campaign to reduce the amount of FOG (fats, oils and grease) and unflushables discharged into the sewer network	£115K	AMP8 onwards	Folkestone and Hythe District Council, Dover District Council	PO2
BROM.PW01.3	Stour	Broomfield Bank	Folkestone Junction WPS	Improve the operational resilience of wastewater pumping station (WPS) to reduce pollution incidents	£465K	AMP8 onwards	-	PO2
BROM.PW01.4	Stour	Broomfield Bank	Elizabeth Street Dover WPS	Improve the operational resilience of wastewater pumping station (WPS) to reduce pollution incidents	£465K	AMP8 onwards	-	PO2
BROM.PW01.6	Stour	Broomfield Bank	Hennings, Martin Mill, Woodensborough, Sutton, Martins Gorse and Ringwould within East Kent Chalk aquifer	Sewer Rehabilitation: Targeted CCTV or electroscan surveys and sewer rehabilitation to reduce the risk of sewer bursts and collapses	£14,100K	AMP9 to AMP10	Environment Agency	PO9 PO12
BROM.PW01.7	Stour	Broomfield Bank	St. James Lane, The Bayle, Castle Street, London Street, Bench Street, Norman Street, Sandgate Road, Oswald Road, Snargate Street,	Enhanced Sewer Maintenance: Increase targeted sewer jetting to reduce the number of blockages in the network	£390K	AMP8 onwards	-	PO1
BROM.PW01.8	Stour	Broomfield Bank	BUCKLAND AVENUE DOVER, LANE ALKHAM, DARLINGHURST ROAD FOLKESTONE, ALKHAM ROAD TEMPLE EWELL	Enhanced Sewer Maintenance: Increase targeted sewer jetting to reduce the number of blockages in the network	£55K	AMP8 onwards	-	PO2
BROM.PW01.9	Stour	Broomfield Bank	Boston Close - Dover	Flood Alleviation: Separate or attenuate excess rainwater in sewer network using Sustainable Drainage Systems (SuDS) to reduce risk of flooding (Costs based on storage solution but surface water separation is our preferred approach)	£1,105K	AMP9	Kent CC, Catchment Partnership, Kent Wildlife Trust	PO4 PO7
BROM.PW01.10	Stour	Broomfield Bank	Crabble area - Dover	Flood Alleviation: Separate or attenuate excess rainwater in sewer network using Sustainable Drainage Systems (SuDS) to reduce risk of flooding (Costs based on storage solution but surface water separation is our preferred approach)	£810K	AMP9	Kent CC, Catchment Partnership, Kent Wildlife Trust	PO4 PO7
BROM.PW01.11	Stour	Broomfield Bank	Canterbury Road - Folkstone	Flood Alleviation: Separate or attenuate excess rainwater in sewer network using Sustainable Drainage Systems (SuDS) to reduce risk of flooding (Costs based on storage solution but surface water separation is our preferred approach)	£710K	AMP9	Kent CC, Catchment Partnership, Kent Wildlife Trust	PO4 PO7
BROM.PW01.12	Stour	Broomfield Bank	Wear Bay Road - Folkestone	Flood Alleviation: Separate or attenuate excess rainwater in sewer network using Sustainable Drainage Systems (SuDS) to reduce risk of flooding (Costs based on storage solution but surface water separation is our preferred approach)	£2,475K	AMP9	Kent CC, Catchment Partnership, Kent Wildlife Trust	PO4 PO7
BROM.PW01.13	Stour	Broomfield Bank	The Leas, Westbourne Gardens - Folkestone	Flood Alleviation: Separate or attenuate excess rainwater in sewer network using Sustainable Drainage Systems (SuDS) to reduce risk of flooding (Costs based on storage solution but surface water separation is our preferred approach)	£720K	AMP9	Kent CC, Catchment Partnership, Kent Wildlife Trust	PO4 PO7
BROM.PW01.14	Stour	Broomfield Bank	High Street, The Esplanade - Sandgate	Flood Alleviation: Separate or attenuate excess rainwater in sewer network using Sustainable Drainage Systems (SuDS) to reduce risk of flooding (Costs based on storage solution but surface water separation is our preferred approach)	£1,075K	AMP9	Kent CC, Catchment Partnership, Kent Wildlife Trust	PO4 PO7
BROM.PW01.15	Stour	Broomfield Bank	Morehall, Coolinge -Folkestone	Flood Alleviation: Separate or attenuate excess rainwater in sewer network using Sustainable Drainage Systems (SuDS) to reduce risk of flooding (Costs based on storage solution but surface water separation is our preferred approach)	£1,910K	AMP9	Kent CC, Catchment Partnership, Kent Wildlife Trust	PO4 PO7

Reference	River Basin (L2)	Wastewater System (L3)	Location	Option	Indicative Cost	Indicative Timescales	Potential Partners	Applicable Planning Objectives
BROM.PW01.16	Stour	Broomfield Bank	Hawkinge town	Flood Alleviation: Separate or attenuate excess rainwater in sewer network using Sustainable Drainage Systems (SuDS) to reduce risk of flooding (Costs based on storage solution but surface water separation is our preferred approach)	£570K	AMP9	Kent CC, Catchment Partnership, Kent Wildlife Trust	PO4 PO7
BROM.PW02.1	Stour	Broomfield Bank	BROOMFIELD BANK WTW	Improve the operational resilience of wastewater treatment works (WTW) to reduce pollution incidents	£6,970K	AMP8 onwards	-	PO2
BROM.PW02.2	Stour	Broomfield Bank	BROOMFIELD BANK WTW	Increase treatment capacity to allow for planned new development	£15,810K	AMP9	-	PO6
BROM.OT01.2	Stour	Broomfield Bank	System Wide	Study and Investigation to understand the impact of wastewater discharges on the local environment and identify measures required to achieve good ecological status in the receiving waterbody	£695K	AMP8	Environment Agency	PO9
BROM.OT01.3	Stour	Broomfield Bank	System Wide	Improve the Hydraulic Model: Surveys and reverification of model to improve confidence and accuracy	£375K	AMP8	-	PO1 PO4 PO5 PO10
BROM.WINEP01.1	Stour	Broomfield Bank	THE STADE FOLKESTONE CEO	Reduce the number of storm discharges from THE STADE FOLKESTONE CEO by a combination of SuDS and storage options	£76,260K	AMP11	-	PO4 PO5
BROM.WINEP01.2	Stour	Broomfield Bank	ELIZABETH ROAD DOVER CSO	Reduce the number of storm discharges from ELIZABETH ROAD DOVER CSO by creating below-ground storage	£2,585K	AMP10	-	PO5
BROM.WINEP01.3	Stour	Broomfield Bank	FOLKESTONE JUNCTION CSO	New or improved screen to reduce aesthetics impacts from storm discharges at FOLKESTONE JUNCTION CSO	£130K	AMP12	-	PO5
BROM.WINEP01.4	Stour	Broomfield Bank	WOOD STREET DOVER CEO	New or improved screen to reduce aesthetics impacts from storm discharges at WOOD STREET DOVER CEO	£130K	AMP11	-	PO5
BROM.WINEP01.5	Stour	Broomfield Bank	FOLKESTONE ROAD DOVER CSO	Reduce the number of storm discharges from FOLKESTONE ROAD DOVER CSO by a combination of SuDS and storage options	£1,820K	AMP10	-	PO4 PO5

Drainage and Wastewater Management Plan: Location of Potential Options BROOMFIELD BANK Wastewater system in Stour River Basin Catchment

from Southern Water

(i) This map should be read in conjunction with the list of Investment Needs for this wastewater system
(ii) The areas shown on this map are the potential locations for the options. The location of the risk may be elsewhere in the system.
(iii) Labels for each location are the option references in the list of Investment Needs
(iv) Drainage Area Plan (DAP) options on flooding and growth are not shown.



- Customer Education
- Pipe Rehabilitation
- Asset Resilience
- Wastewater Treatment
- WINEP Nutient Neutrality
- WINEP Storm Overflows