



Drainage and Wastewater Management Plan

Swalecliffe
Wastewater System Plan



from
**Southern
Water** 

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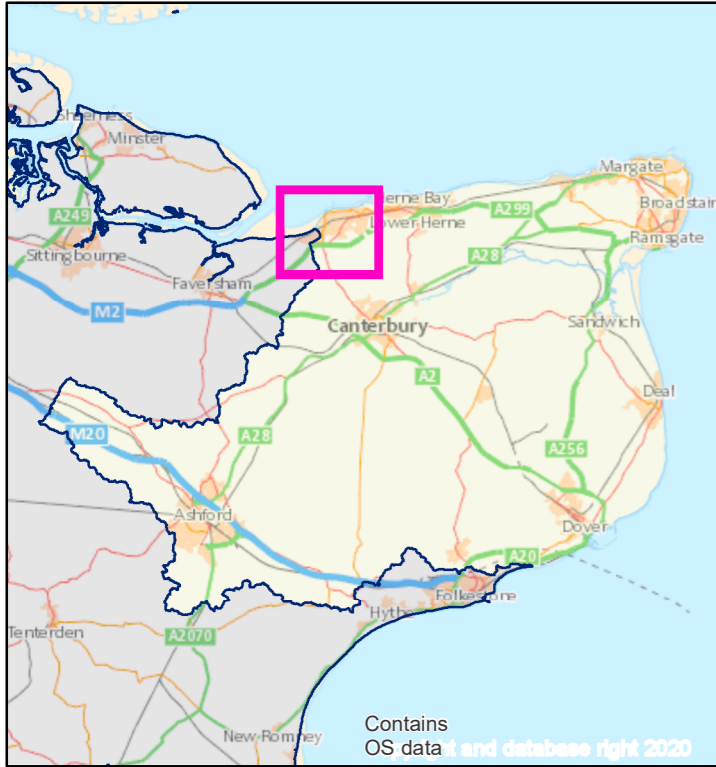
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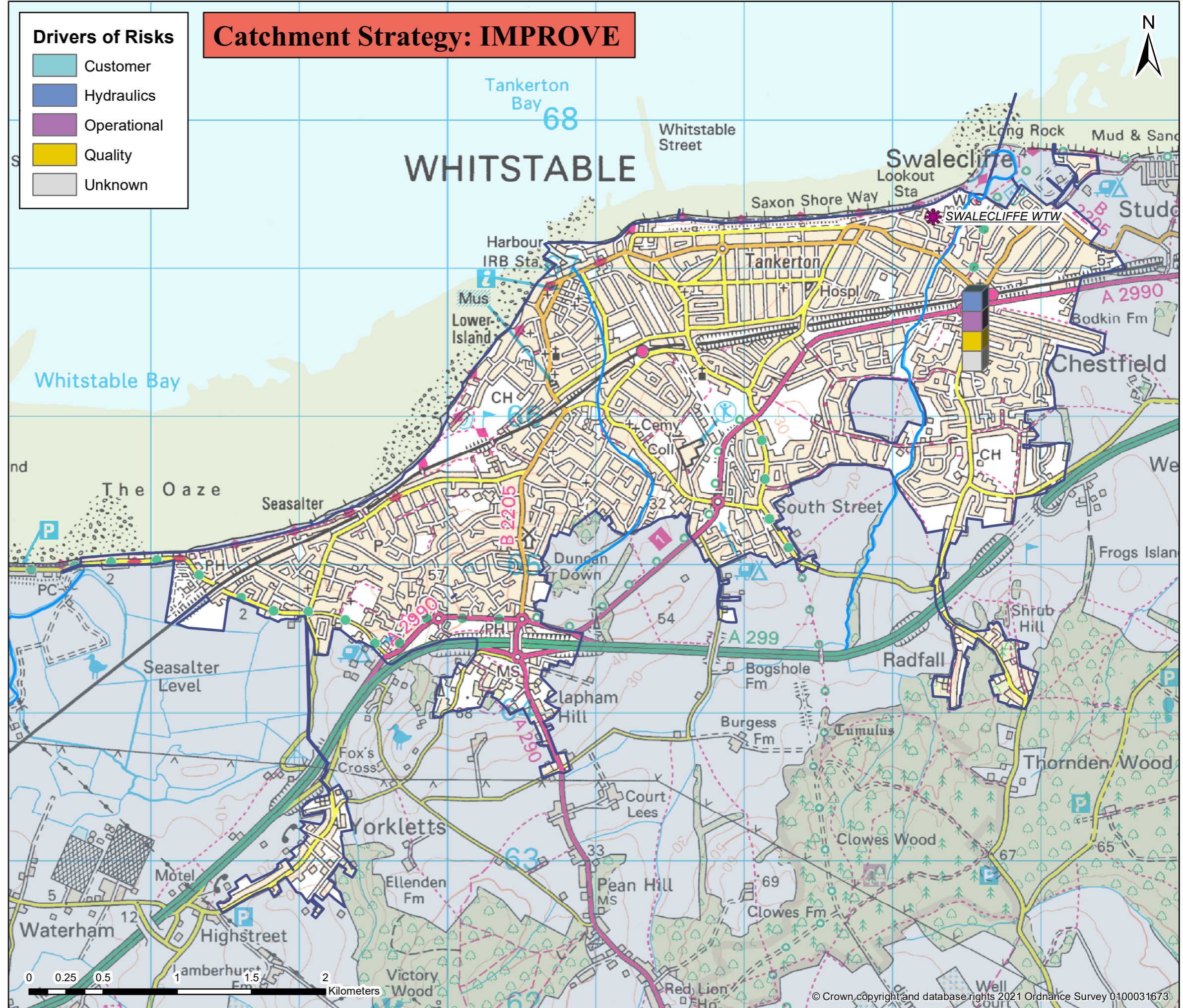
Location of Potential Options

Swalecliffe wastewater system: map and key facts



Population Equivalent (PE)	37,104
Discharge Waterbody	North Sea
Number of Pumping Stations	40
Number of Overflows	7
Length of Sewer (km)	387.2
Catchment Reference	SWAL

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





Problem Characterisation

Swalecliffe (SWAL)

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 Swalecliffe wastewater system

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

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).

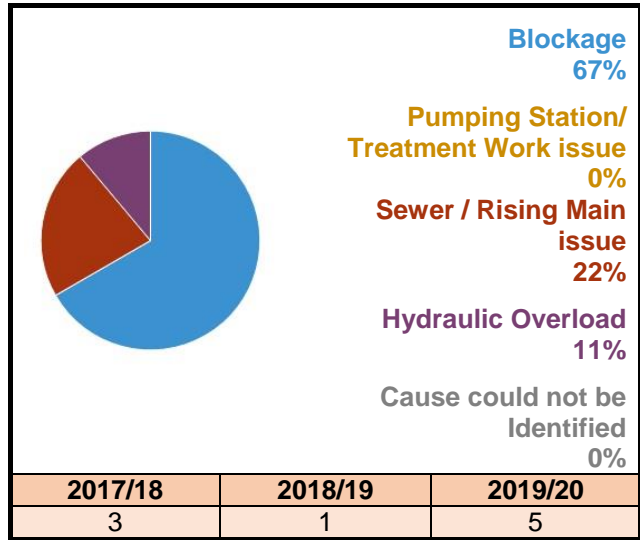


Planning Objective 1: Internal Sewer Flooding Risk

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.

The primary driver for internal sewer flooding in this wastewater system is 'Customer'. Blockages caused 67% 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

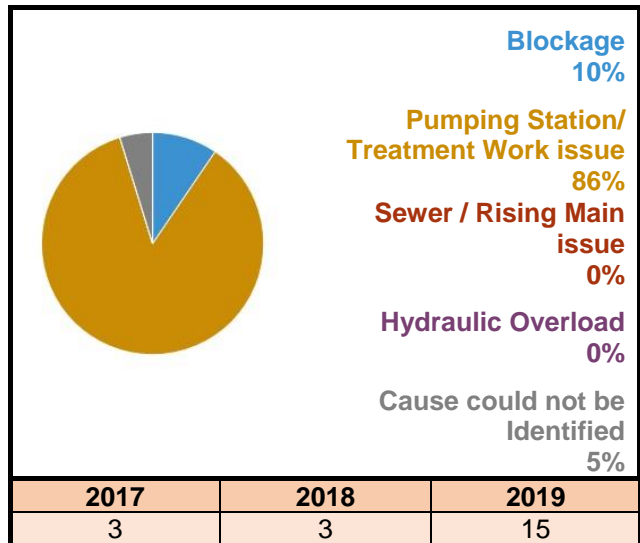


Planning Objective 2: Pollution Risk

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 86% of all incidents recorded in this wastewater system.

Figure 2: Number of pollution incidents per annum and causes



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 between 5.72 and 9.44 incidents per 1,000km per year (a threshold set by Ofwat), the risk is in the 'moderately significant' band.

The primary driver is 'Operational' as the cause of these collapses and bursts is due to the age and condition of the sewers.

Table 2: Sewer collapses and rising main bursts

	2017/18	2018/19	2019/20
Sewer Collapse	3	1	2
	2017/18	1	0
	2018/19	0	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 very significant in 2020 and 2050. This is because our computer model of the sewer network indicate for 2020 that approximately 1800 - 1900 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 2700 - 2800 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 very significant for both 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	3 High	2 High	Less than 8	Between 8-10	10 or more
Bathing Waters	1 High	2 High	Less than 3	Between 3-10	10 or more
Freshwater	1 High	1 High	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 not significant for both 2020 and 2050. This is because the wastewater treatment works has no record of compliance failure during the last three years (2018-2020).

Planning Objective 7: Flooding due to Hydraulic Overload

This is an assessment of the risk of flooding from sewers during a 1 in 30 year storm, and more frequent rainfall, to understand where flooding could occur. The risk of sewer flooding due to hydraulic overload is very significant in 2020 and 2050. The annualised number of properties in areas at risk of flooding is shown in Table 4.

Table 4: Annualised number of properties at risk per 10,000 connections.

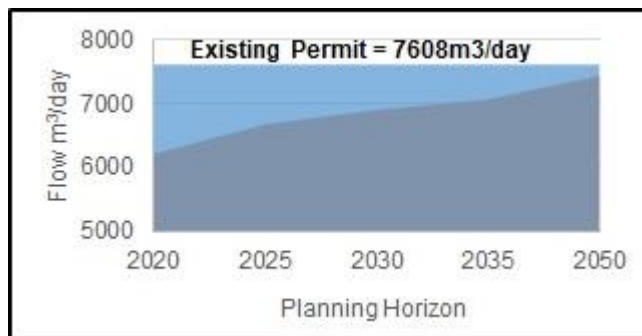
Rainfall Return Period (yr)	Number of Properties at Risk		Annualised per 10,000 connections	
	2020	2050	2020	2050
1 in 1	195	337	123	213
1 in 2	257	498	101	196
1 in 5	660	974	120	177
1 in 10	932	1359	89	129
1 in 20	1273	1902	62	93
1 in 30	1415	2198	46	72
Total Annualised			541	880

This indicates that the existing capacity of the wastewater network can already be exceeded during 1 in 30 year storms (or more frequent events).

Planning Objective 8: Wastewater Treatment Works Dry Weather Flow Compliance

The risk of Wastewater Treatment Works Dry Weather Flow Compliance is moderately significant for both 2020 and 2050. This is because the average annual dry weather flow for 2017, 2018 and 2019 has been between 80% and 100% of the current permit, shown in Figure 3. The predicted DWF in 2050 is also expected to remain below 100% of the current permit.

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



The primary driver is 'Quality' due to the permit and capacity at the treatment work.

Planning Objective 9: Good Ecological Status / Good Ecological Potential

Table 5 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 due to intermittent discharges from overflows.

Table 5: Waterbody not achieving GES/GEP

Waterbody	Classification	EA-Status	Activity
Swalecliffe Brook	Ammonia (Phys-Chem)	Moderate	Sewage discharge (intermittent)
Swalecliffe Brook	Invertebrates	Poor	Sewage discharge (intermittent)
Swalecliffe Brook	Phosphate	Poor	Sewage discharge (intermittent)

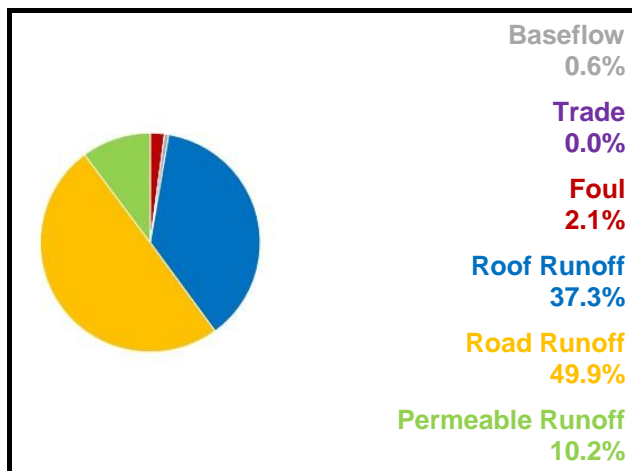
The primary driver is 'Hydraulic'.

Planning Objective 10: Surface Water Management

Our initial high level assessment indicated that there is very 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 97.4% of the flow in the sewers. The total contribution of foul water from homes is 2.1%. The baseflow is infiltration from water in the ground and makes up 0.6% 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

The risk to internationally designated habitat sites from this wastewater system is moderately significant in 2020 but rises to very significant in 2050. This is because Natural England have advised a condition assessment is planned by them after 2025 for the habitat site (hydraulically linked to our wastewater catchment) shown in Table 6.

Table 6: Habitat Sites hydraulically linked to wastewater system

Habitat Sites	
Tankerton Slopes and Swalecliffe	No Threat/Remedy Identified or Anticipated
Thanet Coast	Condition Assessment after 2025

Our growth forecast suggest that more than 2,000 new homes could occur in this wastewater system by 2050 which means the risk to habitat sites increases to very significant by 2050.

Planning Objective 12: Groundwater Pollution

The risk of Groundwater Pollution is not significant. This is because the wastewater network in this wastewater system does not overlap with any groundwater Source Protection Zones (SPZ) used for water supply.

Planning Objective 13: Bathing Waters

The designated bathing waters that could be affected by discharges from this wastewater system are shown in Table 7, along with the current classification from the Environment Agency. The risks from this wastewater system on West Beach (Whitstable) bathing waters has led to an assessment of moderately significant.

Table 7: Bathing Water annual results

Bathing Waters	Annual Results		
	2017	2018	2019
West Beach (Whitstable)	Sufficient	Excellent	Excellent
Tankerton	Excellent	Excellent	Excellent

The primary driver is 'Customer' due to suspected foul to surface water misconnections as well as suspected agriculture affecting the bathing water in this wastewater system.

Planning Objective 14: Shellfish Waters

The discharges from this wastewater system can affect the designated shellfish waters shown in Table 8. The risk of not achieving the faecal standards for shellfish in these designated waters from this wastewater system is very significant. This is because the CEFAS classification for the shellfish waters is in class C, prohibited or seasonal class B or C.

Table 8: Shellfish Waters linked to wastewater system

Shellfish Waters
Swalecliffe
Swale East

Generic Options Assessment for: Swalecliffe (SWAL)



Planning Objectives		2020	Driver	2050	Type of Measures	Generic Option Categories	Icon	Take Forward?	Reasons	Examples of Generic Options
PO1	Internal Flooding	1	Customer	-	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
PO2	Pollution Risk	2	Operational	-		Reduce groundwater levels		N	None of the significant risks in this catchment are caused by high groundwater levels. Hence reducing groundwater levels will not impact any of the risks in this catchment.	Reduce leakage from water supply pipes; pump away schemes to locally lower groundwater near sewer network
PO3	Sewer Collapse	1	Operational	-		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
PO4	Risk of Sewer Flooding in 1 in 50 yr	2	Hydraulic	2		Reduce the quantity / demand		N	None of the significant risks are caused by too much foul wastewater entering our systems from homes and businesses.	Water efficient appliances; water efficient measures; blackwater and/or greywater re-use; treatment at source
PO5	Storm Overflow Performance	2	Hydraulic	2	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.
PO6	Risk of WTW Compliance Failure	0	-	0		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
PO7	Annualised Flood Risk/Hydraulic Overload	2	Hydraulic	2		Wastewater Transfer to treatment elsewhere		Y	-	Transfer flow to other network or treatment sites; transport sewage by tanker to other sites
PO8	DWF Compliance	1	Quality	1	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
PO9	Achieve Good Ecological Status	2	Hydraulic	-		Improve Land and Soils		N/A	Not included in first round of DWMPs	Sludge soil enhancement
PO10	Improve Surface Water Management	2	Hydraulic	-		Mitigate impacts on receiving waters		Y	-	River enhancement, aeration
PO11	Secure Nutrient Neutrality	1	Unknown	2		Reduce impact on properties		Y	-	Property flood resilience; non-return valves; flood guards / doors; air brick covers
PO12	Reduce Groundwater Pollution	0	-	-	Other	Study / Investigation		Y	-	Additional data required; hydraulic model development; WQ monitoring and modelling
PO13	Improve Bathing Water Quality	1	Customer	-						
PO14	Improve Shellfish Water Quality	2	Unknown	-						

Swalecliffe 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 SWAL FC01 - Herne Bay Rd / Burnan Rd	PO4 and PO7 Flooding	SWAL.SC01.1	Surface Water Separation and SuDS for Storage	SEPARATION SOLUTION 2050 20% Separation = 3.	Yes	No					Feasibility and Risk
Control/ Reduce surface water entering the sewers	Flooding Cluster SWAL FC02 - Chestfield Rd	PO4 and PO7 Flooding	SWAL.SC01.2	Surface Water Separation and SuDS for Storage	SEPARATION SOLUTION 2050 20% Separation = 3.	Yes	No					Feasibility and Risk
Control/ Reduce surface water entering the sewers	Flooding Cluster SWAL FC03 - Ham Shades Lane	PO4 and PO7 Flooding	SWAL.SC01.3	Surface Water Separation and SuDS for Storage	SEPARATION SOLUTION 2050 20% Separation = 3.	Yes	No					Feasibility and Risk
Control/ Reduce surface water entering the sewers	Flooding Cluster SWAL FC04 - Borstal Hill	PO4 and PO7 Flooding	SWAL.SC01.4	Surface Water Separation and SuDS for Storage	SEPARATION SOLUTION 2050 20% Separation = 7.	Yes	No					Feasibility and Risk
Control/ Reduce surface water entering the sewers	Flooding Clusters SWAL FC05 - Seasalter Lane	PO4 and PO7 Flooding	SWAL.SC01.5	Surface Water Separation and SuDS for Storage	SEPARATION SOLUTION 2050 20% Separation = 3.	Yes	No					Feasibility and Risk
Control/ Reduce surface water entering the sewers	Flooding Cluster SWAL FC06 - Lucerne Drive	PO4 and PO7 Flooding	SWAL.SC01.6	Surface Water Separation and SuDS for Storage	SEPARATION SOLUTION 2050 20% Separation = 3.	Yes	No					Feasibility and Risk
Control/ Reduce surface water entering the sewers	Tankerton Circus CSO	PO5, PO11 & PO13 - High frequency of spills affecting Thanet Coast, Bathing Waters and Shellfish Waters	SWAL.SC01.7	SuDS for Storage	SuDS (pond / geocellular tank).	Yes	No					Environmental - Strategic Environmental Assessment
Control/ Reduce surface water entering the sewers	Diamond Road Whitstable CEO	PO5, PO9, PO11 & PO13 - High frequency of spills affecting Swalecliffe Brook, Thanet Coast, Bathing Waters and Shellfish Waters	SWAL.SC01.8	SuDS for Storage	SuDS (pond / geocellular tank) with 1480 m3 storage capacity in Westmeads Recreation Ground	Yes	No					Environmental - Strategic Environmental Assessment
Control/ Reduce surface water entering the sewers	Swalecliffe WTW	PO5, PO9, PO11 & PO13 - High frequency of spills affecting Swalecliffe Brook, Thanet Coast, Bathing Waters and Shellfish Waters	SWAL.SC01.9	SuDS for Storage	SuDS (pond / geocellular tank).	Yes	No					Environmental - Strategic Environmental Assessment
Control / Reduce groundwater infiltration												
Improve quality of wastewater entering sewers (inc reducing FOG, RAG, pre-treatment, trade waste)	PO1 - High Street / West Cliff Whitstable, Marine Parade / Herne Bay Road, Lucerne Road PO2 - THANET WAY CHESTFIELD WHITSTABLE & RADFALL CORNER CHESTFIELD WHITSTABLE	PO1, PO2 - Sewer blockages causing internal flooding and pollution incidents	SWAL.SC03.1	Customer Education Programme	Target both domestic and business customers in the catchment with a campaign to reduce FOG and unflushables discharged into the sewer network.	Yes	Yes	Yes	Minor Positive +	£115K	Yes	Best Value
Control / Reduce the quantity / flow of wastewater entering sewer system	Catchment wide	PO8 - Failing to meet WTW DWF Compliance	SWAL.SC04.1	Water Efficiency	Link to Southern Water's Target100 (100 litres/day per household) - use/ promote use of more efficient water appliances and measures within homes and businesses, i.	Yes	No					Environmental - Strategic Environmental Assessment
Control / Reduce the quantity / flow of wastewater entering sewer system	Catchment wide	PO8 - Domestic water consumption and growth causing future DWF Compliance failure	SWAL.SC04.2	Grey water Reuse	Link to Southern Water's Target100 (100 litres/day per household): - reuse of wastewater from sinks, baths, washing machines and other kitchen appliances to reduce domestic clean water consumption: i.	Yes	No					Performance and Sustainability
Network Improvements (eg increase capacity, storage, conveyance)	Flooding Clusters SWAL FC01 - Herne Bay Rd / Burnan Rd, SWAL FC02 - Chestfield Rd and SWAL FC03 - Ham Shades Lane	PO4, PO7 & PO10 - Sewer Flooding	SWAL.PW01.1	SWAL010 DAP Position Statement Option - Sewer Upsize and Online Storage	DAP Option.	Yes	Yes	Yes	Major Positive +++	£TBC - With Partners	No	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	SWAL FC01 Faversham Road, Seasalter Lane, Lucerne Drive and Ladysmith Grove	PO4, PO7 & PO10 - Sewer Flooding	SWAL.PW01.2	SWAL011 DAP Position Statement Option - Sewer Upsize and Offline Storage	DAP Option.	Yes	Yes	Yes	Major Positive +++	£TBC - With Partners	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	SWAL FC02 Joy Lane, Belmont Road & Essex Street	PO4, PO7 & PO10 - Sewer Flooding	SWAL.PW01.3	SWAL012 DAP Position Statement Option - Sewer Upsize and Online Storage	DAP Option.	Yes	Yes	Yes	Major Positive +++	£TBC - With Partners	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	Flooding Cluster SWAL FC04 - Borstal Hill	PO4, PO7 & PO10 - Sewer Flooding	SWAL.PW01.4	Offline Storage Tank	Conventional storage tank.	Yes	No					Operational
Network Improvements (eg increase capacity, storage, conveyance)	Tankerton Circus CSO	PO5, PO11 & PO13 - High frequency of spills affecting Thanet Coast, Bathing Waters and Shellfish Waters	SWAL.PW01.5	Offline Storage Tank	Conventional storage tank.	Yes	No					Operational

Swalecliffe 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
Network Improvements (eg increase capacity, storage, conveyance)	SWAL F015- DIAMOND ROAD WHITSTABLE CEO	PO4, PO5, PO13 & PO14 - Flooding and spill assessments The model predicts: Average number of spills per year (2020): 13.4 Average number of spills per year (2050): 16 Average number of spills per bathing season (2020): 6.5 Average number of spills per bathing season (2050): 6.5 Spills using 12-24hr counting method (average 2017-2019): 4 for Bathing water Spills using 12-24hr counting method (average 2017-2019):11 for Shellfish water Spills using 12-24hr counting method (average 2017-2019):11 for inland water There is a Acceptable cofidenece between spill frequency measured by EDM sensor and model data	SWAL.PW01.6	Additional Storage Capacity	Model Risks Statement The model has a Low risk DAP confidence score of 1 and was last verified in 2017.	Yes	Yes	Yes	Major Positive +++	£1,555K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	Tankerton Circus CSO	PO5, PO11 & PO13 - High frequency of spills affecting Thanet Coast, Bathing Waters and Shellfish Waters	SWAL.PW01.7	Seal Off CSO	Conventional storage tank.	Yes	No					Operational
Network Improvements (eg increase capacity, storage, conveyance)	Diamond Road Whitstable CEO	PO5, PO11 & PO13 - High frequency of spills affecting Thanet Coast, Bathing Waters and Shellfish Waters	SWAL.PW01.8	Seal Off CEO	Conventional storage tank.	Yes	No					Operational
Network Improvements (eg increase capacity, storage, conveyance)	High Street / Albert Street / Belmont Road Whitstable	PO3 - Risk of sewer collapse	SWAL.PW01.9	Improved Sewer Maintenance Programme	Link to Southern Water's Sewer Maintenance Programme: Targeted CCTV / electroscan surveys and proactive sewer rehabilitation to reduce risk of sewer collapse.	Yes	No					Operational
Network Improvements (eg increase capacity, storage, conveyance)	Castle Road / Northwood Road Tankerton	PO3 - Risk of sewer collapse	SWAL.PW01.10	Improved Sewer Maintenance Programme	Link to Southern Water's Sewer Maintenance Programme: Targeted CCTV / electroscan surveys and proactive sewer rehabilitation to reduce risk of sewer collapse.	Yes	No					Operational
Network Improvements (eg increase capacity, storage, conveyance)	Flooding Cluster SWAL FC01 - Herne Bay Rd / Buman Rd	PO4 and PO7 Flooding	SWAL.PW01.11	Storage Tank	DAP Option.	Yes	Yes	Yes	Major Positive +++	£1,245K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	Flooding Cluster SWAL FC02 - Chestfield Rd	PO4 and PO7 Flooding	SWAL.PW01.12	Storage Tank	DAP Option.	Yes	Yes	Yes	Major Positive +++	£767K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	Flooding Cluster SWAL FC03 - Ham Shades Lane	PO4 and PO7 Flooding	SWAL.PW01.13	Storage Tank	DAP Option.	Yes	Yes	Yes	Major Positive +++	£1,175K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	Flooding Cluster SWAL FC04 - Borstal Hill	PO4 and PO7 Flooding	SWAL.PW01.14	Storage Tank	DAP Option.	Yes	Yes	Yes	Major Positive +++	£1,720K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	Flooding Clusters SWAL FC05 - Seasalter Lane	PO4 and PO7 Flooding	SWAL.PW01.15	Storage Tank	DAP Option.	Yes	Yes	Yes	Major Positive +++	£3,925K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	Flooding Cluster SWAL FC06 - Lurcene Drive	PO4 and PO7 Flooding	SWAL.PW01.16	Storage Tank	DAP Option.	Yes	Yes	Yes	Major Positive +++	£1,160K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	SWAL FC03 Millstrood Road	PO4 and PO7 - Growth	SWAL.PW01.17	Upsizing and new pipework	DAP Option.	Yes	Yes	Yes	Major Positive +++	£625K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	SWAL FC04 Maydowns Road	PO4 and PO7 - Growth	SWAL.PW01.18	Upsizing	DAP Option.	Yes	Yes	Yes	Major Positive +++	£625K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	SWAL FC05 Whitebridge Farm WPS	PO4 and PO7 - Growth	SWAL.PW01.19	Upsizing	DAP Option.	Yes	Yes	Yes	Major Positive +++	£625K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	SWAL FC06 Golden Hill	PO4 and PO7 - Growth	SWAL.PW01.20	Upsizing	DAP Option.	Yes	Yes	Yes	Major Positive +++	£625K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	SWAL FC07 Upstream Golden Hill WPS	PO4 and PO7 - Growth	SWAL.PW01.21	Upsizing	DAP Option.	Yes	Yes	Yes	Major Positive +++	£625K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	SWAL FC08 Grasmere Road	PO4 and PO7 - Growth	SWAL.PW01.22	Upsizing	DAP Option.	Yes	Yes	Yes	Major Positive +++	£625K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	SWAL FC09 Clapham Hill	PO4 and PO7 - Growth	SWAL.PW01.23	Upsizing	DAP Option.	Yes	Yes	Yes	Major Positive +++	£625K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	SWAL FC10 Thanet Way	PO1, PO4 and PO7 - Growth and Flooding	SWAL.PW01.24	Upsizing , new pipework and offline storage	DAP Option.	Yes	Yes	Yes	Major Positive +++	£625K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	SWAL FC11 Diamond Road	PO4 and PO7 - Growth	SWAL.PW01.25	Upsizing	DAP Option.	Yes	Yes	Yes	Major Positive +++	£625K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	SWAL FC12 Church Lane	PO4 and PO7 - Growth	SWAL.PW01.26	Upsizing	DAP Option.	Yes	Yes	Yes	Major Positive +++	£625K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	WHITEBRIDGE FARM SEASALTER WPS	PO2- Pollution Risk	SWAL.PW01.27	Maintenance Programme WPS	A WPS rehabilitation (capital maintenance) programme relimitate the risk of pollution incidents by increasing resilience to operational failures - M&E faults Link to the 'Pollution Reduction Programme'.	Yes	Yes	Yes	Minor Negative -	£700K	Yes	Least Cost
Network Improvements (eg increase capacity, storage, conveyance)	STATION ROAD WHITSTABLE WPS	PO2- Pollution Risk	SWAL.PW01.28	Maintenance Programme WPS	A WPS rehabilitation (capital maintenance) programme relimitate the risk of pollution incidents by increasing resilience to operational failures - M&E faults Link to the 'Pollution Reduction Programme'.	Yes	Yes	Yes	Minor Negative -	£700K	Yes	Least Cost

Swalecliffe 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
Network Improvements (eg increase capacity, storage, conveyance)	BROOK ROAD SWALECLIFFE NEW WPS	PO2- Pollution Risk	SWAL.PW01.29	Maintenance Programme WPS	A WPS rehabilitation (capital maintenance) programme relimitate the risk of pollution incidents by increasing resilience to operational failures - M&E faults Link to the 'Pollution Reduction Programme'.	Yes	Yes	Yes	Minor Negative -	£700K	Yes	Least Cost
Network Improvements (eg increase capacity, storage, conveyance)	STATION ROAD WHITSTABLE WPS	PO2- Pollution Risk	SWAL.PW01.30	Maintenance Programme WPS	A WPS rehabilitation (capital maintenance) programme relimitate the risk of pollution incidents by increasing resilience to operational failures - M&E faults Link to the 'Pollution Reduction Programme'.	Yes	Yes	Yes	Minor Negative -	£700K	Yes	Least Cost
Network Improvements (eg increase capacity, storage, conveyance)	THANET WAY CHESTFIELD WHITSTABLE & RADFALL CORNER CHESTFIELD WHITSTABLE	PO2- Pollution Risk	SWAL.PW01.31	Jetting Programme	Improved targeting and frequency of sewer jetting under MST (maintenance scheduled tasks) programme Link to improved jetting MST Programme for identified high risk locations.	Yes	Yes	Yes	Minor Negative -	£25K	Yes	Least Cost
Network Improvements (eg increase capacity, storage, conveyance)	Catchment wide	PO3- Sewer Collapse	SWAL.PW01.32	Pipe Rehabilitation Programme	Targeted CCTV / electroscan surveys and proactive sewer rehabilitation to reduce risk of sewer collapse.	Yes	Yes	Yes	Minor Negative -	£3,215K	Yes	Least Cost
Improve treatment (capacity and quality at existing works or develop new WTWs)	Swalecliffe WTW	PO5, PO9, PO11 & PO13 - High frequency of spills affecting Swalecliffe Brook, Thanet Coast, Bathing Waters and Shellfish Waters	SWAL.PW02.1	Improve Asset Resilience to M&E Faults	Link to Southern Water's PIRP (pollution incident reduction plan) to improve the WTW's resilience to M&E faults.	Yes	Yes	Yes	Minor Positive +	£TBC - With Partners	No	Best Value
Improve treatment (capacity and quality at existing works or develop new WTWs)	Swalecliffe WTW	PO5, PO9, PO11 & PO13 - High frequency of spills affecting Swalecliffe Brook, Thanet Coast, Bathing Waters and Shellfish Waters	SWAL.PW02.2	Improve Storm Sewage Discharge Capacity	Link to Southern Water's AMP7 SSO Scheme (PRN 780401) to replace the structurally damaged short sea outfall and restore capacity to discharge storm flows to sea.	Yes	Yes	Yes	Minor Positive +	£TBC - With Partners	No	Best Value
Improve treatment (capacity and quality at existing works or develop new WTWs)	SWALECLIFFE WTW	PO8 (2050)- Dry Weather Flow	SWAL.PW02.3	Permit Review	Link to Southern Water's AMP7 Scheme (PRN 791018) to increase FFT (flow to full treatment) and reduce the risk to dry weather flow compliance Diameter of settlement tanks required- Primary Tank at 10.	Yes	No					Operational
Improve treatment (capacity and quality at existing works or develop new WTWs)	Swalecliffe WTW	PO2- Pollution Risk	SWAL.PW02.4	Maintenance Programme WTW	Link with the 'Pollution Reduction Plan' and AMP7 SSO Scheme (PRN 780401) to replace the structurally damaged short sea outfall; An efficient maintenance programme for the treatment works to eliminate the risk of a pollution incident due to an operational failure.	Yes	No					Operational
Wastewater Transfer												
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)	Flooding Cluster SWAL FC01 - Herne Bay Rd / Burnan Rd	PO4, PO7 & PO10 - Sewer Flooding	SWAL.RC04.1	Property Flood Mitigation / Resistance	Short-term property level protection ahead of flood alleviation scheme - Non-return valves and flood mitigation doors / gates.	Yes	No					Operational
Reduce consequences Properties (e.g. Property Flood Resilience)	Flooding Cluster SWAL FC02 - Chestfield Rd	PO4, PO7 & PO10 - Sewer Flooding	SWAL.RC04.2	Property Flood Mitigation / Resistance	Short-term property level protection ahead of flood alleviation scheme - Non-return valves and flood mitigation doors / gates.	Yes	No					Operational
Reduce consequences Properties (e.g. Property Flood Resilience)	Flooding Cluster SWAL FC03 - Ham Shades Lane	PO4, PO7 & PO10 - Sewer Flooding	SWAL.RC04.3	Property Flood Mitigation / Resistance	Short-term property level protection ahead of flood alleviation scheme - Non-return valves and flood mitigation doors / gates.	Yes	No					Operational
Reduce consequences Properties (e.g. Property Flood Resilience)	Flooding Cluster SWAL FC04 - Borstal Hill	PO4, PO7 & PO10 - Sewer Flooding	SWAL.RC04.4	Property Flood Mitigation / Resistance	Short-term property level protection ahead of flood alleviation scheme - Non-return valves and flood mitigation doors / gates.	Yes	No					Operational
Reduce consequences Properties (e.g. Property Flood Resilience)	Flooding Cluster SWAL FC05 - Seasalter Lane	PO4, PO7 & PO10 - Sewer Flooding	SWAL.RC04.5	Property Flood Mitigation / Resistance	Short-term property level protection ahead of flood alleviation scheme - Non-return valves and flood mitigation doors / gates.	Yes	No					Operational
Reduce consequences Properties (e.g. Property Flood Resilience)	Flooding Cluster SWAL FC06 - Lurcene Drive	PO4, PO7 & PO10 - Sewer Flooding	SWAL.RC04.6	Property Flood Mitigation / Resistance	Short-term property level protection ahead of flood alleviation scheme - Non-return valves and flood mitigation doors / gates.	Yes	No					Operational
Study/ investigation to gather more data	Catchment wide	PO11 - Continuous (WTW treated effluent) and / or intermittent (storm overflow) wastewater discharges affecting Nutrient Neutrality on Thanet Coast	SWAL.OT01.1	Study and Investigations to identify Measures to Secure Nutrient Neutrality	Study / Investigation required to understand the impact of wastewater discharges and achieve or prevent deterioration from Natural England's revised Common Standards Monitoring Guidance (rCSMG) targets Total Phosphorus (TP) and Total Nitrogen (TN) on the Thanet Coast, Tankerton Slopes and Swalecliffe.	Yes	Yes	Yes	Minor Positive +	£75K	Yes	Best Value
Study/ investigation to gather more data	SWAL FC13 Northwood Road Whitstable No.1 CSO	PO4 and PO7 - Growth	SWAL.OT01.2	Survey and modelling investigation	DAP Option.	Yes	Yes	Yes	Major Positive +++	£625K	No	Best Value
Study/ investigation to gather more data	FC14Tankerton Circus CSO	PO4, PO5, PO7, PO13 & PO14	SWAL.OT01.3	Survey, Modelling investigation and Spill Attenuation	DAP Option.	Yes	Yes	Yes	Major Positive +++	£625K	Yes	Best Value
Study/ investigation to gather more data	SWAL F016 - SWALECLIFFE STW	PO4, PO5, PO7, PO13 & PO14	SWAL.OT01.4	Further investigation/modelling and Spill Attenuation	Model Risks Statement The model has a Low risk DAP confidence score of 1 and was last verified in 2017.	Yes	Yes	Yes	Major Positive +++	£1,000K	Yes	Best Value
Study/ investigation to gather more data	Catchment Wide	PO1, PO4, PO7 & PO10 - Sewer Flooding PO5 - Storm Overflow Performance	SWAL.OT01.5	Improve Hydraulic Model	There is a Low confidence between Storm Overflow spill frequencies measured by EDM sensor and model data.	Yes	Yes	Yes	Major Positive +++	£200K	Yes	Best Value

Swalecliffe 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
Study/ investigation to gather more data	Catchment wide	PO9- GE Status / Potential Sewage discharge (intermittent) into Swalecliffe Brook	SWAL.OT01.6	Study and Investigations to Achieve Good Ecological Status	Catchment was banded 2 in because; Swalecliffe Brook (Sewage discharge (intermittent)) Study and Investigations to understand the impact of wastewater discharges on Swalecliffe Brook and identify measures required to achieve good ecological status.	Yes	Yes	Yes	Minor Positive +	£695K	No	Best Value
Study/ investigation to gather more data	Catchment Wide	PO13 - Bathing Waters	SWAL.OT01.7	Study and Investigations	Link to ongoing study and investigations to identify causes of impact on Bathing Waters and appropriate measures to address them.	Yes	Yes	Yes	Minor Positive +	£TBC - With Partners	Yes	Best Value
Study/ investigation to gather more data	Catchment Wide	PO14 - Shellfish Waters	SWAL.OT01.8	Study and Investigations	Link to ongoing study and investigations to identify causes of impact on Shellfish Waters and appropriate measures to address them.	Yes	Yes	Yes	Minor Positive +	£TBC - With Partners	Yes	Best Value

Drainage and Wastewater Management Plan (DWMP)

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

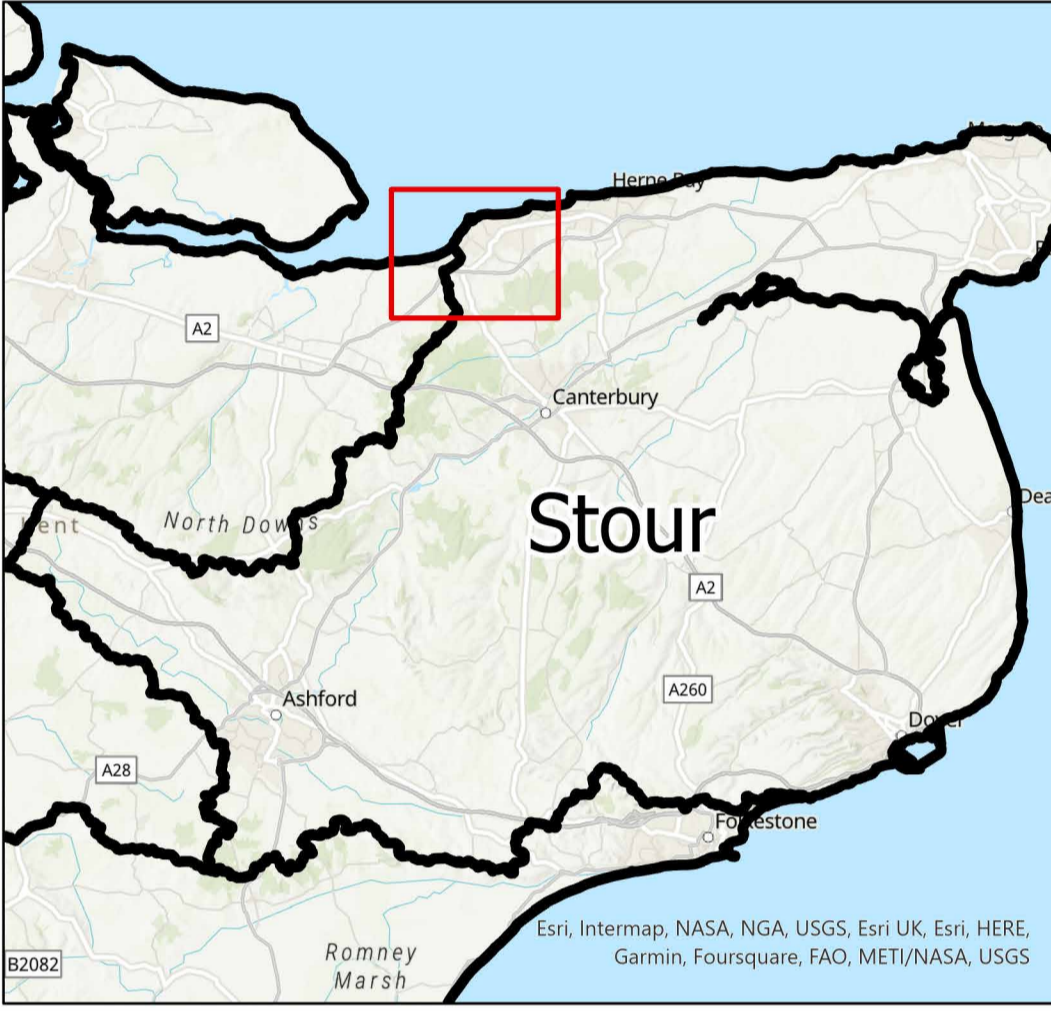
Reference	River Basin (L2)	Wastewater System (L3)	Location	Option	Indicative Cost	Indicative Timescales	Potential Partners	Applicable Planning Objectives
Stour Swalecliffe								
SWAL.SC03.1	Stour	Swalecliffe	High Street, West Cliff Whitstable, Marine Parade, Herne Bay Road, Lucerne Road	Customer Education Programme: Targeted campaign to reduce the amount of FOG (fats, oils and grease) and unflushables discharged into the sewer network	£115K	AMP8 onwards	Canterbury City Council	PO1 PO2
SWAL.PW01.11	Stour	Swalecliffe	Herne Bay Road / Burnan Road	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)	£1,245K	AMP9	Kent CC, Catchment Partnership, Kent Wildlife Trust	PO4 PO7
SWAL.PW01.12	Stour	Swalecliffe	Chestfield Road	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)	£765K	AMP9	Kent CC, Catchment Partnership, Kent Wildlife Trust	PO4 PO7
SWAL.PW01.13	Stour	Swalecliffe	Ham Shades Lane	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)	£1,175K	AMP9	Kent CC, Catchment Partnership, Kent Wildlife Trust	PO4 PO7
SWAL.PW01.14	Stour	Swalecliffe	Borstal Hill	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)	£1,720K	AMP9	Kent CC, Catchment Partnership, Kent Wildlife Trust	PO4 PO7
SWAL.PW01.15	Stour	Swalecliffe	Seasalter Lane	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)	£3,925K	AMP9	Kent CC, Catchment Partnership, Kent Wildlife Trust	PO4 PO7
SWAL.PW01.16	Stour	Swalecliffe	Lurcene Drive	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)	£1,160K	AMP9	Kent CC, Catchment Partnership, Kent Wildlife Trust	PO4 PO7
SWAL.PW01.17	Stour	Swalecliffe	Millstrood Road	Growth scheme from our Drainage Area Plan (DAP): Construct new sewers and upsize sections of existing ones	£625K	AMP9	-	PO4 PO7
SWAL.PW01.18	Stour	Swalecliffe	Maydowns Road	Growth scheme from our Drainage Area Plan (DAP): Upsize sections of existing local sewers	£625K	AMP9	-	PO4 PO7
SWAL.PW01.19	Stour	Swalecliffe	Area upstream of Whitebridge Farm WPS	Growth scheme from our Drainage Area Plan (DAP): Upsize sections of existing local sewers	£625K	AMP9	-	PO4 PO7
SWAL.PW01.20	Stour	Swalecliffe	Golden Hill	Growth scheme from our Drainage Area Plan (DAP): Upsize sections of existing local sewers	£625K	AMP9	-	PO4 PO7
SWAL.PW01.21	Stour	Swalecliffe	Area upstram of Golden Hill WPS	Growth scheme from our Drainage Area Plan (DAP): Upsize sections of existing local sewers	£625K	AMP9	-	PO4 PO7
SWAL.PW01.22	Stour	Swalecliffe	Grasmere Road	Growth scheme from our Drainage Area Plan (DAP): Upsize sections of existing local sewers	£625K	AMP9	-	PO4 PO7
SWAL.PW01.23	Stour	Swalecliffe	Clapham Hill	Growth scheme from our Drainage Area Plan (DAP): Upsize sections of existing local sewers	£625K	AMP9	-	PO4 PO7
SWAL.PW01.24	Stour	Swalecliffe	Thanet Way	Growth scheme from our Drainage Area Plan (DAP): Construct new storage manhole, 107m of new 1800mm dia sewer and upsize sections of local sewers	£625K	AMP9	-	PO1 PO4 PO7
SWAL.PW01.25	Stour	Swalecliffe	Diamond Road	Growth scheme from our Drainage Area Plan (DAP): Upsize sections of existing local sewers	£625K	AMP9	-	PO4 PO7
SWAL.PW01.26	Stour	Swalecliffe	Church Lane	Growth scheme from our Drainage Area Plan (DAP): Upsize sections of existing local sewers	£625K	AMP9	-	PO4 PO7
SWAL.PW01.27	Stour	Swalecliffe	WHITEBRIDGE FARM SEASALTER WPS	Improve the operational resilience of wastewater pumping station (WPS) to reduce pollution incidents	£700K	AMP8 onwards	-	PO2
SWAL.PW01.28	Stour	Swalecliffe	STATION ROAD WHITSTABLE WPS	Improve the operational resilience of wastewater pumping station (WPS) to reduce pollution incidents	£700K	AMP8 onwards	-	PO2
SWAL.PW01.29	Stour	Swalecliffe	BROOK ROAD SWALECLIFFE NEW WPS	Improve the operational resilience of wastewater pumping station (WPS) to reduce pollution incidents	£700K	AMP8 onwards	-	PO2
SWAL.PW01.30	Stour	Swalecliffe	STATION ROAD WHITSTABLE WPS	Improve the operational resilience of wastewater pumping station (WPS) to reduce pollution incidents	£700K	AMP8 onwards	-	PO2

Reference	River Basin (L2)	Wastewater System (L3)	Location	Option	Indicative Cost	Indicative Timescales	Potential Partners	Applicable Planning Objectives
SWAL.PW01.31	Stour	Swalecliffe	THANET WAY CHESTFIELD WHITSTABLE & RADFALL CORNER CHESTFIELD WHITSTABLE	Enhanced Sewer Maintenance: Increase targeted sewer jetting to reduce the number of blockages in the network	£25K	AMP8 onwards	Canterbury City Council	PO2
SWAL.PW01.32	Stour	Swalecliffe	Lucerne Drive WPS, Lucerne Road Seasalter WPS, Kingsdaown Lane, Clifton Road, Harbour Street, Castle Road, Swansfield Road, Richmond Road	Sewer Rehabilitation: Targeted CCTV or electroscan surveys and sewer rehabilitation to reduce the risk of sewer bursts and collapses	£3,215K	AMP8 onwards	-	PO3
SWAL.PW02.2	Stour	Swalecliffe	Swalecliffe WTW	Increase capacity to allow for planned new development	£1,980K	AMP9	Environment Agency	PO8
SWAL.PW02.3	Stour	Swalecliffe	Swalecliffe WTW	Improve the operational resilience of wastewater pumping station (WPS) to reduce pollution incidents	£6,970K	AMP8 onwards	-	PO2
SWAL.OT01.5	Stour	Swalecliffe	System Wide	Improve the Hydraulic Model: Surveys and reverification of model to improve confidence and accuracy	£200K	AMP8	-	PO1 PO4 PO5 PO7 PO10
SWAL.OT01.6	Stour	Swalecliffe	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
SWAL.WINEP01.1	Stour	Swalecliffe	SWALECLIFFE CSO	Reduce the number of storm discharges from SWALECLIFFE CSO by creating below-ground storage	£2,375K	AMP8	-	PO5 PO9 PO14
SWAL.WINEP01.2	Stour	Swalecliffe	DIAMOND ROAD WHITSTABLE CEO	Reduce the number of storm discharges from DIAMOND ROAD WHITSTABLE CEO by a combination of SuDS and storage options	£9,330K	AMP8	-	PO4 PO5 PO7 PO9 PO13 PO14
SWAL.WINEP01.3	Stour	Swalecliffe	SWALECLIFFE SSO	New or improved screen to reduce aesthetics impacts from storm discharges at SWALECLIFFE SSO	£130K	AMP11	-	PO5 PO9
SWAL.WINEP01.4	Stour	Swalecliffe	GRASMERE ROAD CHESTFIELD STORM TANKS CSO	New or improved screen to reduce aesthetics impacts from storm discharges at GRASMERE ROAD CHESTFIELD STORM TANKS CSO	£130K	AMP11	-	PO5 PO9
SWAL.WINEP01.5	Stour	Swalecliffe	TANKERTON CIRCUS CSO	Reduce the number of storm discharges from TANKERTON CIRCUS CSO by a combination of SuDS and storage options	£7,340K	AMP8	-	PO4 PO5 PO7 PO9 PO13 PO14
SWAL.WINEP01.6	Stour	Swalecliffe	NORTHWOOD ROAD WHITSTABLE NO 2 CSO	New or improved screen to reduce aesthetics impacts from storm discharges at NORTHWOOD ROAD WHITSTABLE NO 2 CSO	£130K	AMP9	-	PO5 PO9 PO13
SWAL.WINEP01.7	Stour	Swalecliffe	NORTHWOOD ROAD WHITSTABLE NO 1 CSO	Reduce the number of storm discharges from NORTHWOOD ROAD WHITSTABLE NO 1 CSO by a combination of SuDS and storage options	£6,070K	AMP8	-	PO4 PO5 PO7 PO9 PO13 PO14
SWAL.WINEP01.8	Stour	Swalecliffe	BROOK ROAD SWALECLIFFE CEO	New or improved screen to reduce aesthetics impacts from storm discharges at BROOK ROAD SWALECLIFFE CEO	£130K	AMP11	-	PO5 PO9
SWAL.WINEP.PO2.1	Stour	Swalecliffe	Swalecliffe WTW	Action to reduce total phosphorus and/or total nitrogen levels from discharges which drain to internationally designated sites where there is a risk from nutrients	£25,135K	AMP10	-	PO9 PO11

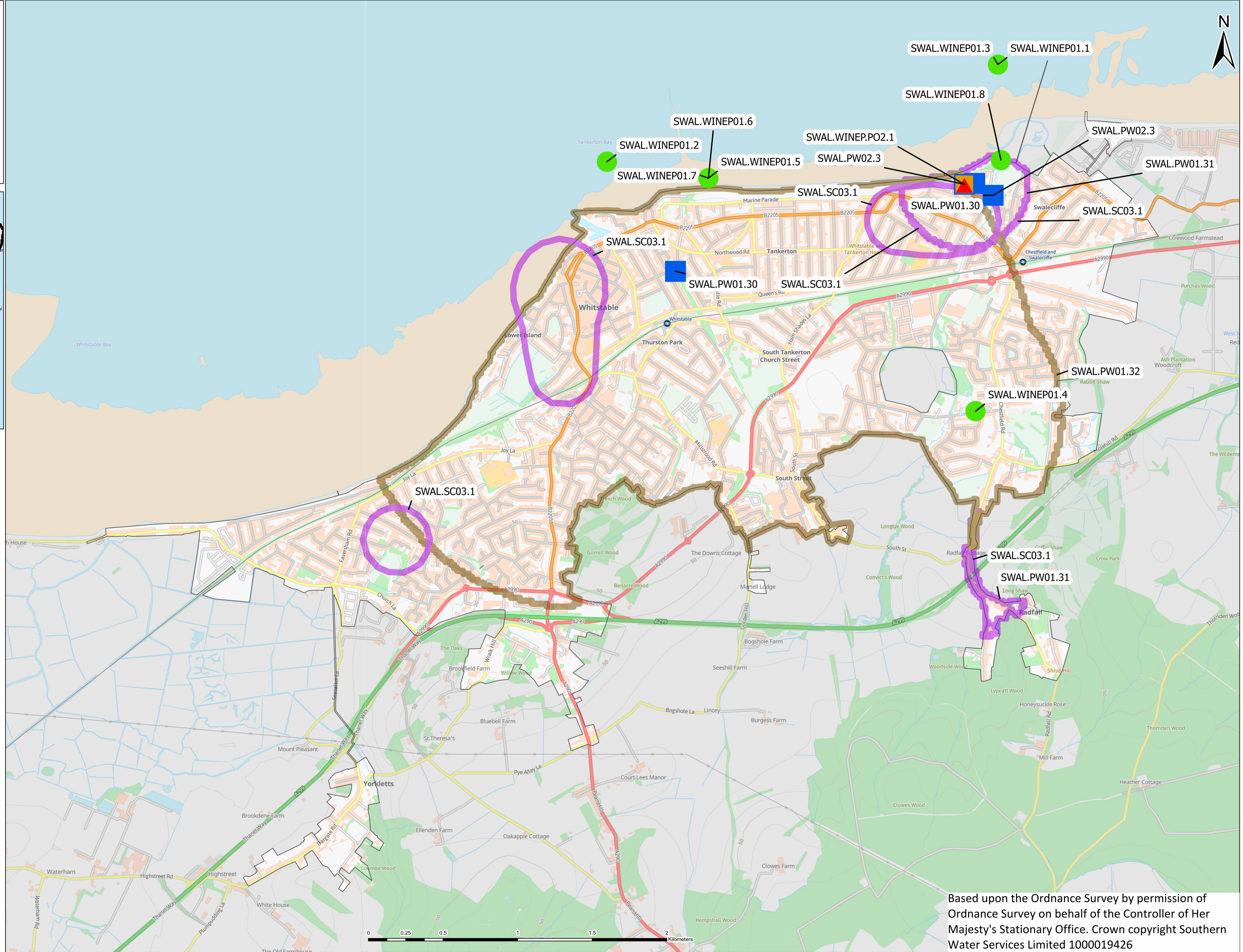
Drainage and Wastewater Management Plan: Location of Potential Options SWALECLIFFE Wastewater system in Stour River Basin Catchment



(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.



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



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