



Drainage and Wastewater Management Plan

Woolston
Wastewater System Plan



from
**Southern
Water** 

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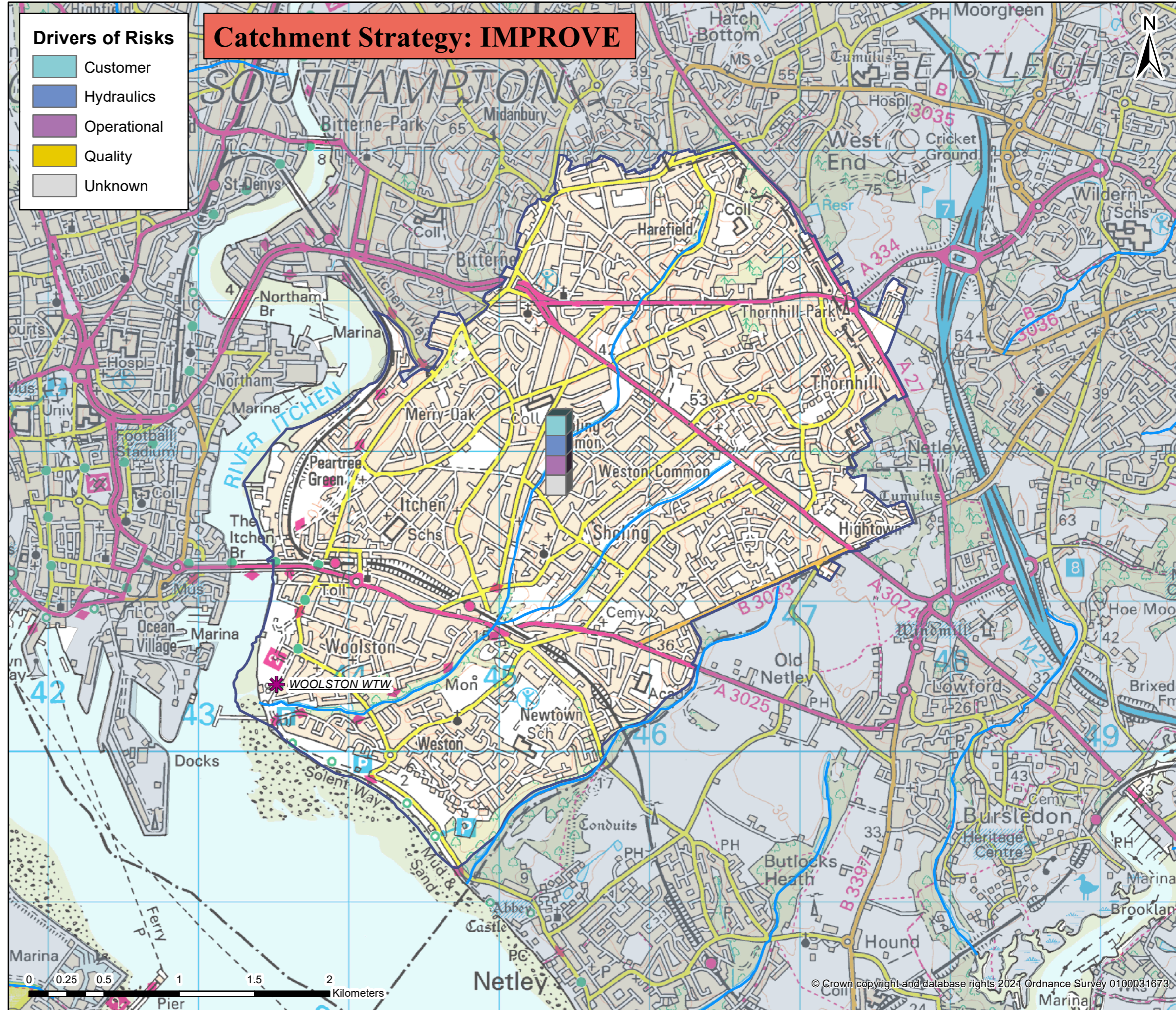
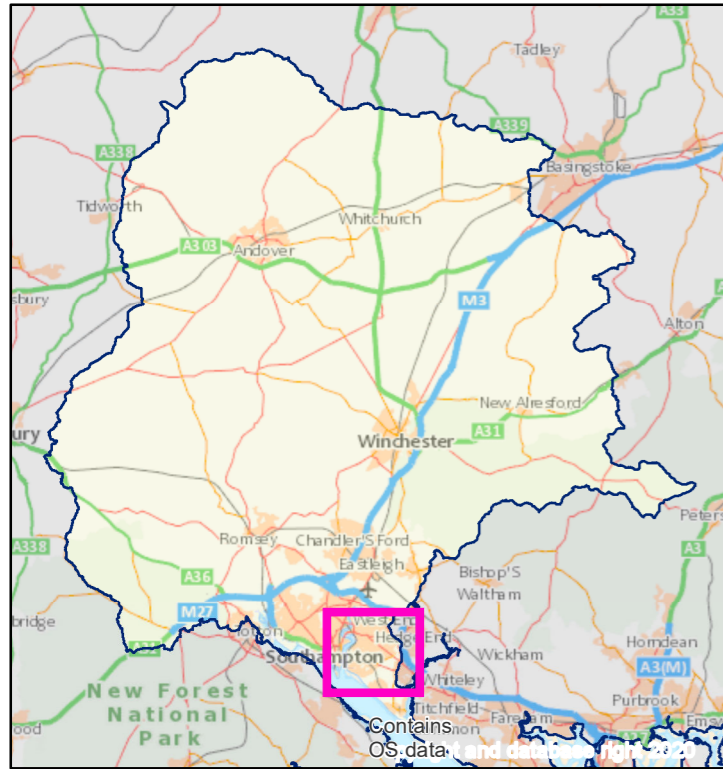
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Woolston wastewater system: map and key facts



| | |
|----------------------------|--------------|
| Population Equivalent (PE) | 68,457 |
| Discharge Waterbody | River Itchen |
| Number of Pumping Stations | 10 |
| Number of Overflows | 1 |
| Length of Sewer (km) | 534.7 |
| Catchment Reference | WOOL |

| BRAVA Results Table (WOOL) | | |
|--|------|------|
| Planning Objective | 2020 | 2050 |
| 1 Internal Sewer Flooding Risk | 1 | |
| 2 Pollution Risk | 1 | |
| 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 | 0 | 0 |
| 9 Good Ecological Status / Potential | 0 | |
| 10 Surface Water Management | 1 | |
| 11 Nutrient Neutrality | 2 | 2 |
| 12 Groundwater Pollution | 0 | |
| 13 Bathing Waters | NA | |
| 14 Shellfish Waters | 2 | |



Problem Characterisation

Woolston (WOOL)

This document describes the causes of the risks identified by the Baseline Risk and Vulnerability Assessment (BRAVA). The BRAVA results for this wastewater system are summarised in Table 1. The results indicate that flooding, pollution and water quality are the main concerns in this wastewater system. 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 Woolston wastewater system

| Planning Objectives | | 2020 | Driver | 2050 |
|---------------------|--|------|-------------|------|
| 1 | Internal Sewer Flooding Risk | 1 | Customer | |
| 2 | Pollution Risk | 1 | Customer | |
| 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 | 0 | - | 0 |
| 9 | Good Ecological Status / Good Ecological Potential | 0 | - | |
| 10 | Surface Water Management | 1 | Hydraulic | |
| 11 | Nutrient Neutrality | 2 | Unknown | 2 |
| 12 | Groundwater Pollution | 0 | - | |
| 13 | Bathing Waters | NA | - | |
| 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

Investment Strategy

The risks identified in this wastewater system 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).

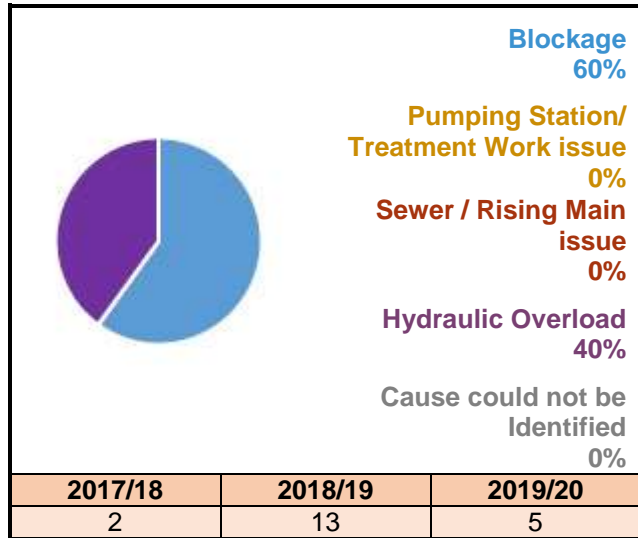


Planning Objective 1: Internal Sewer Flooding Risk

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 60% of all incidents recorded in this wastewater system. Blockages are often caused by fats, oils, greases, 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

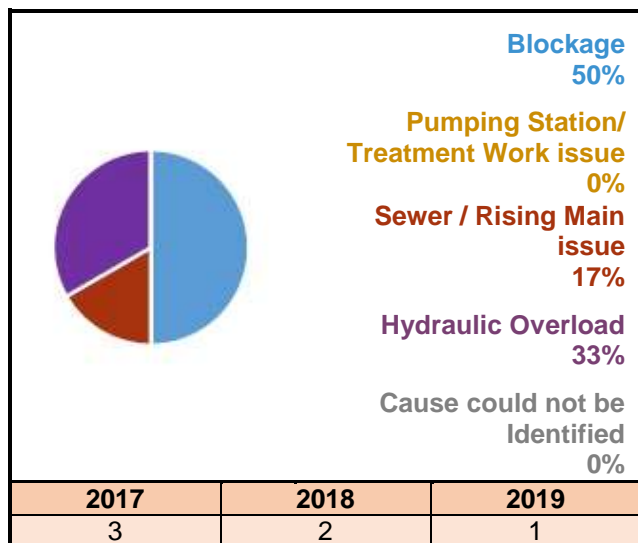


Planning Objective 2: Pollution Risk

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 between 24.51 and 49.01 incidents per 10,000km per year (a threshold set by Ofwat) so the risk is in the 'moderately significant' band.

The primary driver for pollution is 'Customer'. Blockages caused 50% of all incidents recorded in this wastewater system. Blockages are often caused by fats, oils, greases, nappies, wet wipes and sanitary products within the system. These items are non-flushable and should not be disposed of into wastewater systems.

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 | 2017/18 | 4 | 4 |
| | 2018/19 | 4 | 2 |
| | 2019/20 | 0 | 0 |
| Rising Main Bursts | 2017/18 | 0 | 0 |
| | 2018/19 | 0 | 0 |
| | 2019/20 | 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 7700 - 7800 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 10000 - 10100 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 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 | 0 Medium | 0 Medium | 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 | 676 | 1171 | 427 | 740 |
| 1 in 2 | 952 | 1610 | 375 | 633 |
| 1 in 5 | 2610 | 3758 | 473 | 681 |
| 1 in 10 | 3965 | 5927 | 377 | 564 |
| 1 in 20 | 5679 | 7815 | 277 | 381 |
| 1 in 30 | 7237 | 8797 | 237 | 288 |
| Total Annualised | | | 2167 | 3288 |

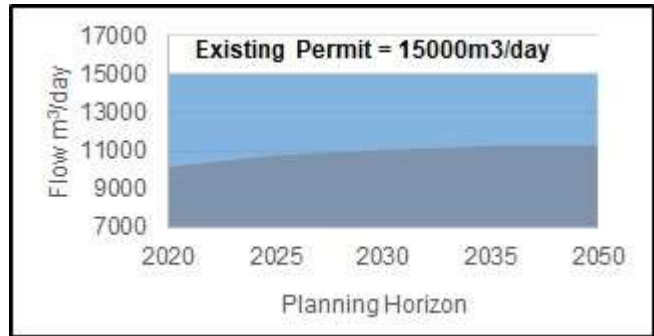


This indicates that the existing capacity of the wastewater network can already be exceeded during 1 in 30 year storms (or more frequent events).

Planning Objective 8: Wastewater Treatment Works Dry Weather Flow Compliance

The risk of Wastewater Treatment Works Dry Weather Flow (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

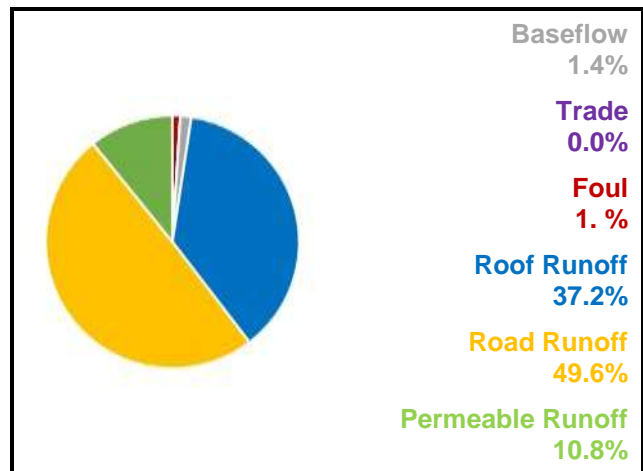
This wastewater system is not hydraulically linked to a waterbody where wastewater operations are contributing to not achieving GES/GEP, therefore the risk is not significant.

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 97.6% of the flow in the sewers. The total contribution of foul water from homes is 1.0%. 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

The risk to internationally designated habitat sites from this wastewater system is very significant in 2020 and 2050. This is because Natural England have advised that there is a risk to condition for the habitat sites that are hydraulically linked to our wastewater system, listed in Table 5.

Table 5: Habitat Sites hydraulically linked to wastewater system

| Habitat Sites | |
|----------------------------|---|
| Solent and Dorset Coast | Phosphate permit review required Overflow Spills |
| Solent & Southampton Water | No Threat/Remedy Identified or Anticipated |

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

This wastewater system does not discharge into a designated bathing water.

Planning Objective 14: Shellfish Waters

The discharges from this wastewater system can affect the designated shellfish waters shown in Table 6. 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 6: Shellfish Waters linked to wastewater system

| Shellfish Waters |
|----------------------|
| Southampton Water Sw |

Generic Options Assessment for: Woolston (WOOL)



| 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 | 1 | Customer | - | | 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 |
| 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 | | N | The causes of risk are not due to where our systems discharge to the environment or our ability to increase the capacity to connect more homes. Transferring wastewater for treatment elsewhere will not reduce any of the significant risks in this catchment. | Transfer flow to other network or treatment sites; transport sewage by tanker to other sites |
| PO8 | DWF Compliance | 0 | - | 0 | 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 | 0 | - | - | | Improve Land and Soils | | N/A | Not included in first round of DWMPs | Sludge soil enhancement |
| PO10 | Improve Surface Water Management | 1 | Hydraulic | - | | Mitigate impacts on receiving waters | | Y | - | River enhancement, aeration |
| PO11 | Secure Nutrient Neutrality | 2 | 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 | NA | - | - | | | | | | |
| PO14 | Improve Shellfish Water Quality | 2 | Unknown | - | | | | | | |

Woolston 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 | Hotspot 1 - Itchen | PO1- Internal Flooding | WOOL.SC01.1 | Customer Education Programme | Customer education programme to reduce the risk. | Yes | Yes | Yes | Minor Positive + | £115K | Yes | Best Value |
| Control/ Reduce surface water entering the sewers | Hotspot 2 - Harefield | PO2- Pollution Risk | WOOL.SC01.2 | Customer Education Programme | Customer education programme. | Yes | Yes | Yes | Minor Positive + | £115K | Yes | Best Value |
| Control/ Reduce surface water entering the sewers | Dena Road and Pound Street | PO4 and PO7 Flooding | WOOL.SC01.3 | Surface Water Separation | DAP Option. | Yes | Yes | Yes | Major Positive +++ | £198,855K | No | Best Value |
| Control/ Reduce surface water entering the sewers | SUNNINGDALE GARDENS and SOMERSET AVENUE | PO4 and PO7 Flooding | WOOL.SC01.4 | Surface Water Separation | DAP Option. | Yes | Yes | Yes | Major Positive +++ | £200,425K | No | Best Value |
| Control/ Reduce surface water entering the sewers | CANON PLACE and NAPIER ROAD | PO4 and PO7 Flooding | WOOL.SC01.5 | Surface Water Separation | DAP Option. | Yes | Yes | Yes | Major Positive +++ | £200,530K | No | Best Value |
| Control/ Reduce surface water entering the sewers | BUTTS ROAD and SOUTH EAST ROAD | PO4 and PO7 Flooding | WOOL.SC01.6 | Surface Water Separation | DAP Option. | Yes | Yes | Yes | Major Positive +++ | £200,275K | No | Best Value |
| Control/ Reduce surface water entering the sewers | SQUIRREL DRIVE | PO4 and PO7 Flooding | WOOL.SC01.7 | Surface Water Separation | DAP Option. | Yes | Yes | Yes | Major Positive +++ | £200,905K | No | Best Value |
| Control/ Reduce surface water entering the sewers | LAWRENCE GROVE, SWIFT ROAD and OBELISK ROAD | PO4 and PO7 Flooding | WOOL.SC01.8 | Surface Water Separation | DAP Option. | Yes | Yes | Yes | Major Positive +++ | £201,165K | No | Best Value |
| Control/ Reduce surface water entering the sewers | SWIFT ROAD and SWIFT GARDENS | PO4 and PO7 Flooding | WOOL.SC01.9 | Surface Water Separation | DAP Option. | Yes | Yes | Yes | Major Positive +++ | £199,085K | No | Best Value |
| Control/ Reduce surface water entering the sewers | BLACKTHORN ROAD, PEARTREE AVENUE and MERRIDALE ROAD | PO4 and PO7 Flooding | WOOL.SC01.10 | Surface Water Separation | DAP Option. | Yes | Yes | Yes | Major Positive +++ | £199,625K | No | Best Value |
| Control/ Reduce surface water entering the sewers | BRAESIDE ROAD | PO4 and PO7 Flooding | WOOL.SC01.11 | Surface Water Separation | DAP Option. | Yes | Yes | Yes | Major Positive +++ | £7,565K | No | Best Value |
| Control / Reduce groundwater infiltration | | | | | | | | | | | | |
| Improve quality of wastewater entering sewers (inc reducing FOG, RAG, pre-treatment, trade waste) | | | | | | | | | | | | |
| Control / Reduce the quantity / flow of wastewater entering sewer system | | | | | | | | | | | | |
| Network Improvements (eg increase capacity, storage, conveyance) | Catchment Wide | PO1- Internal Flooding | WOOL.PW01.1 | Maintenance Programme | Improve resilience: An efficient maintenance programme for pumping stations and/Treatment works to eliminate the risk of a pollution incident due to an operational failure. | No | | | | | | Risk and uncertainty - future resilience |
| Network Improvements (eg increase capacity, storage, conveyance) | Braeside Road, Cleethorpes Road, Victoria Road, Poole Road, Swift Road | PO1- Internal Flooding | WOOL.PW01.2 | Additional Storage | Additional Storage. | No | | | | | | Risk and uncertainty - future resilience |
| Network Improvements (eg increase capacity, storage, conveyance) | Hotspot 2 - Harefield | PO3- Sewer Collapse | WOOL.PW01.3 | Pipe Rehabilitation Programme | Targeted CCTV / electroscan surveys and proactive sewer rehabilitation to reduce risk of sewer collapse. | Yes | Yes | Yes | Minor Positive + | £635K | Yes | Best Value |
| Network Improvements (eg increase capacity, storage, conveyance) | Catchment Wide | PO8 (2050)- Dry Weather Flow | WOOL.PW01.4 | Pipe Rehabilitation Programme | Relining/improving structural grades of sewers across the catchment. | No | | | | | | Cost Effective |
| Network Improvements (eg increase capacity, storage, conveyance) | WOOL FC01 Kathleen Road | PO4 - Flooding | WOOL.PW01.5 | Offlinestorage | DAP Option. | No | | | | | | |
| Network Improvements (eg increase capacity, storage, conveyance) | WOOL FC02 Merridale Road | PO4 - Flooding | WOOL.PW01.6 | Flow Diversion and New Sewers | DAP Option. | No | | | | | | |
| Network Improvements (eg increase capacity, storage, conveyance) | WOOL FC03 Off Hazel Road | PO4 and PO5 - Growth | WOOL.PW01.8 | New sewer | DAP Option. | No | | | | | | |
| Network Improvements (eg increase capacity, storage, conveyance) | WOOL FC06 Victoria Road | PO4 and PO5 - Growth | WOOL.PW01.9 | New Development alternate connection point | DAP Option. | No | | | | | | |
| Network Improvements (eg increase capacity, storage, conveyance) | WOOL FC04 Hazel Road/ Hazel Road WPS | PO4 and PO5 - Growth | WOOL.PW01.10 | Sewer Upsizing, Upsize WPS pump rate | DAP Option. | No | | | | | | |
| Network Improvements (eg increase capacity, storage, conveyance) | WOOL FC05 John Thornycroft Road and Vosper Road | PO4 and PO5 - Growth | WOOL.PW01.11 | Sewer Upsizing, Throttle 150mm sewer | DAP Option. | No | | | | | | |
| Network Improvements (eg increase capacity, storage, conveyance) | WOOL FC07 Sholing Road and South East Road | PO4 and PO5 - Growth | WOOL.PW01.12 | Sewer Upsizing and New Development alternate connection point | DAP Option. | No | | | | | | |
| Network Improvements (eg increase capacity, storage, conveyance) | WOOL FC08 Weston Lane | PO4 and PO5 - Growth | WOOL.PW01.13 | New diversion chamber | DAP Option. | No | | | | | | |
| Network Improvements (eg increase capacity, storage, conveyance) | WOOL FC09 Tickleford Drive | PO4 and PO5 - Growth | WOOL.PW01.14 | Sewer Upsizing | DAP Option. | No | | | | | | |
| Network Improvements (eg increase capacity, storage, conveyance) | Hotspot 1# | PO1- Internal Flooding | WOOL.PW01.15 | Jetting Programme | Jetting Programme. | Yes | Yes | Yes | Minor Negative - | £135K | Yes | Least Cost |
| Network Improvements (eg increase capacity, storage, conveyance) | Catchment Wide | PO2- Pollution Risk | WOOL.PW01.16 | Pipe Rehabilitation Programme | Pipe Rehabilitation Programme. | Yes | Yes | Yes | Minor Negative - | £65K | Yes | Least Cost |
| Network Improvements (eg increase capacity, storage, conveyance) | Hotspot 2 - Harefield | PO2- Pollution Risk | WOOL.PW01.20 | Jetting Programme | Jetting Programme. | Yes | Yes | Yes | Minor Negative - | £35K | Yes | Least Cost |
| Improve treatment (capacity and quality at existing works or develop new WTWs) | Dena Road and Pound Street | PO4 and PO7 Flooding | WOOL.PW02.2 | Storage | DAP Option. | Yes | Yes | Yes | Major Positive +++ | £595K | Yes | Best Value |
| Improve treatment (capacity and quality at existing works or develop new WTWs) | SUNNINGDALE GARDENS and SOMERSET AVENUE | PO4 and PO7 Flooding | WOOL.PW02.3 | Storage | DAP Option. | Yes | Yes | Yes | Major Positive +++ | £2,215K | Yes | Best Value |
| Improve treatment (capacity and quality at existing works or develop new WTWs) | CANON PLACE and NAPIER ROAD | PO4 and PO7 Flooding | WOOL.PW02.4 | Storage | DAP Option. | Yes | Yes | Yes | Major Positive +++ | £2,365K | Yes | Best Value |
| Improve treatment (capacity and quality at existing works or develop new WTWs) | BUTTS ROAD and SOUTH EAST ROAD | PO4 and PO7 Flooding | WOOL.PW02.5 | Storage | DAP Option. | Yes | Yes | Yes | Major Positive +++ | £2,155K | Yes | Best Value |

Woolston 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 |
|--|--|---|------------------|---|---|-----------------------|---------------------|------------------|--------------------|----------------------|------------------|--|
| Improve treatment (capacity and quality at existing works or develop new WTWs) | SQUIRREL DRIVE | PO4 and PO7 Flooding | WOOL.PW02.6 | Storage | DAP Option. | Yes | Yes | Yes | Major Positive +++ | £2,780K | Yes | Best Value |
| Improve treatment (capacity and quality at existing works or develop new WTWs) | LAWRENCE GROVE, SWIFT ROAD and OBELISK ROAD | PO4 and PO7 Flooding | WOOL.PW02.7 | Storage | DAP Option. | Yes | Yes | Yes | Major Positive +++ | £3,010K | Yes | Best Value |
| Improve treatment (capacity and quality at existing works or develop new WTWs) | SWIFT ROAD and SWIFT GARDENS | PO4 and PO7 Flooding | WOOL.PW02.8 | Storage | DAP Option. | Yes | Yes | Yes | Major Positive +++ | £820K | Yes | Best Value |
| Improve treatment (capacity and quality at existing works or develop new WTWs) | BLACKTHORN ROAD, PEARTREE AVENUE and MERRIDALE ROAD | PO4 and PO7 Flooding | WOOL.PW02.9 | Storage | DAP Option. | Yes | Yes | Yes | Major Positive +++ | £1,465K | Yes | Best Value |
| Improve treatment (capacity and quality at existing works or develop new WTWs) | BRAESIDE ROAD | PO4 and PO7 Flooding | WOOL.PW02.10 | Storage | DAP Option. | Yes | Yes | Yes | Major Positive +++ | £575K | Yes | Best Value |
| 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 | Braeside Road, Cleethorpes Road, Victoria Road, Poole Road, Swift Road | PO1- Internal Flooding | WOOL.RC03.1 | Property Flood Mitigation / Resistance | Short-term property level protection ahead of flood alleviation scheme - Non-return valves and flood mitigation doors / gates. | No | | | | | | Risk and uncertainty - future resilience |
| Reduce consequences Properties (e.g. Property Flood Resilience) | | | | | | | | | | | | |
| Study/ investigation to gather more data | Catchment Wide | PO1- Internal Flooding | WOOL.OT01.1 | Investigation into causes | Further investigation to identify the cause of the internal flooding incident. | No | | | | | | Cost Effective |
| Study/ investigation to gather more data | Catchment Wide | PO3- Sewer Collapse | WOOL.OT01.2 | CCTV Investigation | CCTV Investigation. | No | | | | | | |
| Study/ investigation to gather more data | Catchment Wide | PO8 (2050)- Dry Weather Flow | WOOL.OT01.3 | Pipe Rehabilitation Programme / CCTV Investigation / Infiltration Reduction Programme | Relining/improving structural grades of sewers across the catchment. | No | | | | | | Risk and uncertainty - future resilience |
| Study/ investigation to gather more data | Solent and Dorset Coast Solent & Southampton Water | PO11 - Nutrient Neutrality | WOOL.OT01.4 | Nutrient Budget | Catchment is Hydraulically linked to; Solent and Dorset Coast (Threat/Remedy Identified or Anticipated) Solent & Southampton Water (NO Threat/Remedy Identified or Anticipated). | Yes | Yes | Yes | Minor Positive + | £75K | Yes | Best Value |
| Study/ investigation to gather more data | Shellfish Water Sites | PO14- Shellfish Water Quality | WOOL.OT01.5 | Study and Investigations to Improve Shellfish Waters | Study / Investigation required to understand the impact of wastewater discharges, and achieve or prevent deterioration of shellfish waters Linking with 'Asset Strategy and Planning Team'. | No | | | | | | Deliver the required outcome |
| Study/ investigation to gather more data | Catchment Wide Overflow Locations | PO4- 1 in 50 year PO5- Storm Overflow PO7- Hydraulic Overload PO10- Surface Water Management | WOOL.OT01.6 | Improve Hydraulic Model | Study / Investigation: Update and re-verify the Woolston Hydraulic Model to improve model confidence. | Yes | Yes | Yes | Minor Positive + | £190K | Yes | Best Value |
| Study/ investigation to gather more data | WOOL FC01 - WOOLSTON WTW | PO5 - Spill Assessments | WOOL.OT01.7 | Storage (FC01 - WOOLSTON WTW) | The DAP model has a confidence score of 2 and was last verified in 2014. | Yes | Yes | Yes | Major Positive +++ | £1,000K | Yes | Best Value |
| Study/ investigation to gather more data | Catchment Wide | PO1 PO4 PO7 PO10 | WOOL.OT01.8 | Study / Investigations - data sharing | Sutdy / Investigation: Sharing of flood data to ensure flooding locations identified by SWS and SCC match. | Yes | Yes | Yes | Minor Positive + | £TBC - With Partners | Yes | Best Value |
| Study/ investigation to gather more data | Catchment Wide | PO1 PO4 PO7 PO10 | WOOL.OT01.9 | Study / Investigations - Identify misconnections | Study / Investigation: Identify locations of misconnections, reducing the unknown sources of flow into the catchments sewer systems. | 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

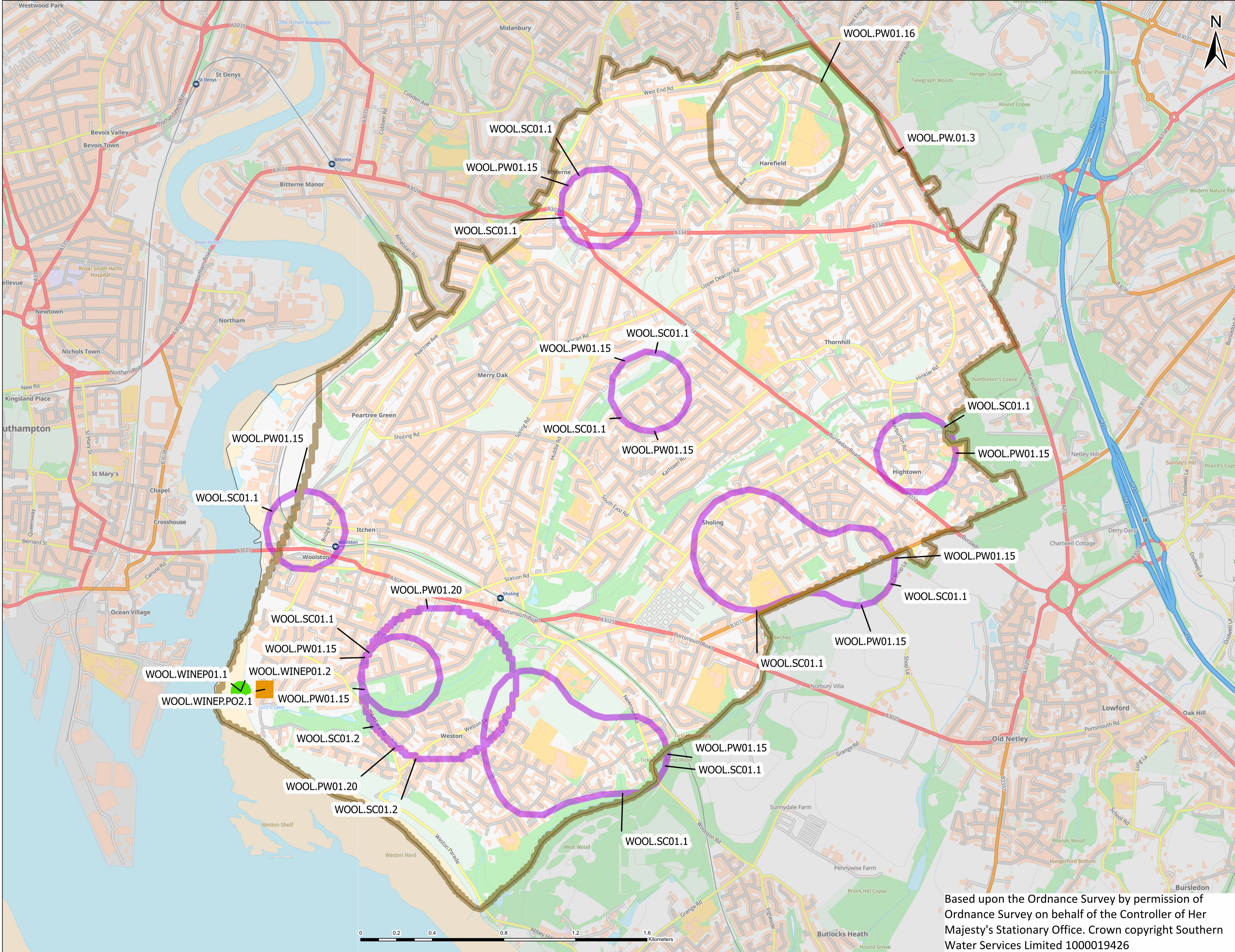
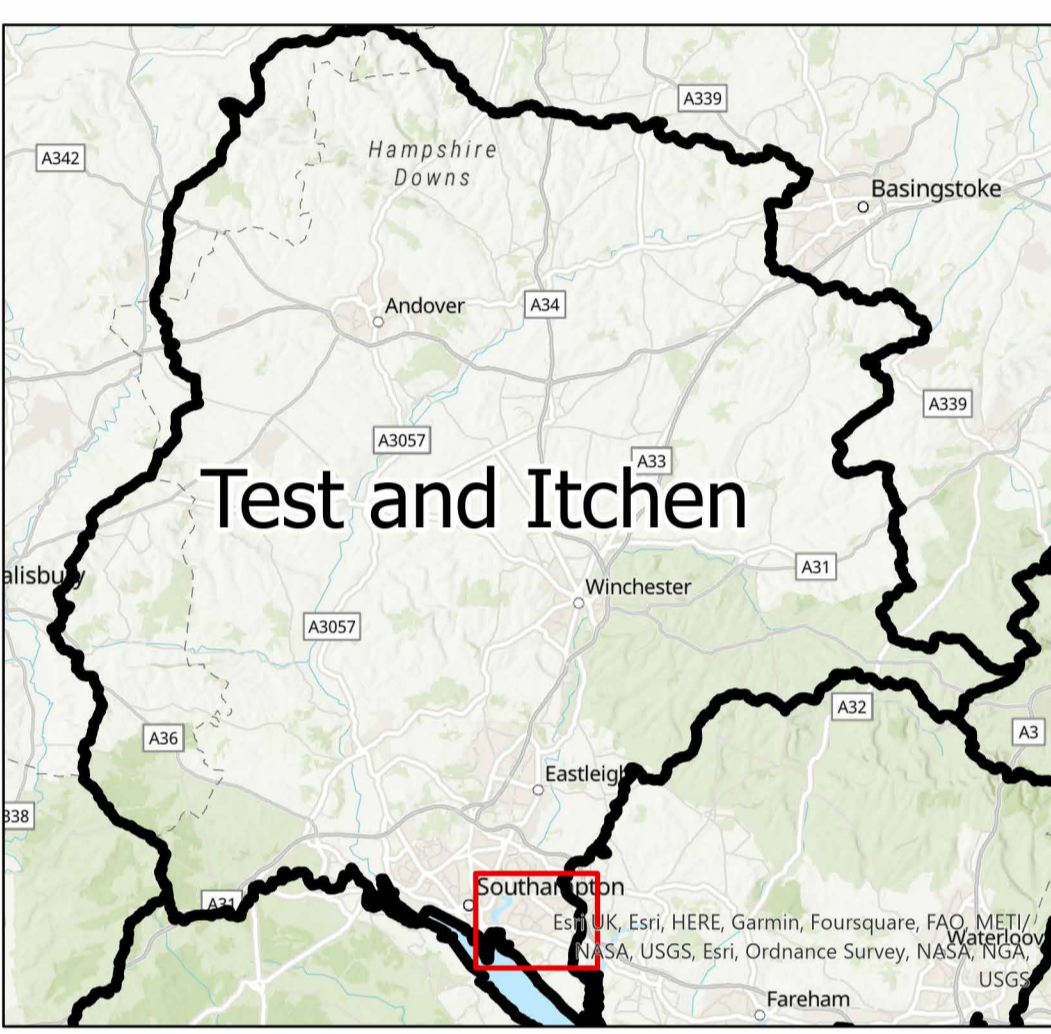
| Reference | River Basin (L2) | Wastewater System (L3) | Location | Option | Indicative Cost | Indicative Timescales | Potential Partners | Applicable Planning Objectives |
|------------------------|------------------|------------------------|---|--|-----------------|-----------------------|--------------------------|--------------------------------|
| Test and Itchen | | | | | | | | |
| Woolston | | | | | | | | |
| WOOL.SC01.1 | Test and Itchen | Woolston | Hotspot 1 - Itchen | 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 | Southampton City Council | PO1 |
| WOOL.SC01.2 | Test and Itchen | Woolston | Hotspot 1 - Harefield | 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 | Southampton City Council | PO2 |
| WOOL.PW01.3 | Test and Itchen | Woolston | Hotspot 1 - Harefield | Sewer Rehabilitation: Targeted CCTV or electroscan surveys and sewer rehabilitation to reduce the risk of sewer bursts and collapses | £635K | AMP8 onwards | - | PO3 |
| WOOL.PW01.15 | Test and Itchen | Woolston | Hotspot 1 - Itchen | Enhanced Sewer Maintenance: Increase targeted sewer jetting to reduce the number of blockages in the network | £135K | AMP8 onwards | - | PO1 |
| WOOL.PW01.16 | Test and Itchen | Woolston | Woolston | Sewer Rehabilitation: Targeted CCTV or electroscan surveys and sewer rehabilitation to reduce the risk of sewer bursts and collapses | £65K | AMP8 onwards | - | PO2 |
| WOOL.PW01.20 | Test and Itchen | Woolston | Hotspot 1 - Harefield | Enhanced Sewer Maintenance: Increase targeted sewer jetting to reduce the number of blockages in the network | £35K | AMP8 onwards | - | PO2 |
| WOOL.PW02.2 | Test and Itchen | Woolston | Dena Road and Pound Street | 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) | £595K | AMP9 | - | PO4 PO7 |
| WOOL.PW02.3 | Test and Itchen | Woolston | Sunningdale Gardens and Somerset Avenue | 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) | £2,215K | AMP9 | - | PO4 PO7 |
| WOOL.PW02.4 | Test and Itchen | Woolston | Canon Place and Napier 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) | £2,365K | AMP9 | - | PO4 PO7 |
| WOOL.PW02.5 | Test and Itchen | Woolston | Butts Road and South East 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) | £2,155K | AMP9 | - | PO4 PO7 |
| WOOL.PW02.6 | Test and Itchen | Woolston | Squirrel 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) | £2,780K | AMP9 | - | PO4 PO7 |
| WOOL.PW02.7 | Test and Itchen | Woolston | Lawrence Grove, Swift Road, Obelisk 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) | £3,010K | AMP9 | - | PO4 PO7 |
| WOOL.PW02.8 | Test and Itchen | Woolston | Swift Road and Swift Gardens | 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) | £820K | AMP9 | - | PO4 PO7 |
| WOOL.PW02.9 | Test and Itchen | Woolston | Blacthorn Road, Peartree Avenue, and Merridale 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) | £1,465K | AMP9 | - | PO4 PO7 |
| WOOL.PW02.10 | Test and Itchen | Woolston | Braeside 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) | £575K | AMP9 | - | PO4 PO7 |
| WOOL.OT01.6 | Test and Itchen | Woolston | System Wide | Improve the Hydraulic Model: Surveys and reverification of model to improve confidence and accuracy | £190K | AMP8 | Southampton City Council | PO4 PO5 PO7 PO10 |
| WOOL.OT01.9 | Test and Itchen | Woolston | System Wide | Improve the Hydraulic Model: Surveys and reverification of model to improve confidence and accuracy | £TBC | AMP8 | Southampton City Council | PO4 PO7 PO10 |
| WOOL.WINEP01.1 | Test and Itchen | Woolston | WOOLSTON SSO | Reduce the number of storm discharges from WOOLSTON SSO by a combination of SuDS and storage options | £17,020K | AMP8 | - | PO4 PO5 PO7 PO14 |

| Reference | River Basin (L2) | Wastewater System (L3) | Location | Option | Indicative Cost | Indicative Timescales | Potential Partners | Applicable Planning Objectives |
|------------------|------------------|------------------------|--------------|--|-----------------|-----------------------|--------------------|--------------------------------|
| WOOL.WINEP.PO2.1 | Test and Itchen | Woolston | Woolston WTW | Modification of existing denitrifying membrane bioreactors (MBR) to achieve 10mg/l Total N permit (WINEP OAR 08SO104000) | £12,850K | AMP8 | - | PO11 |
| WOOL.WINEP01.2 | Test and Itchen | Woolston | WOOLSTON EMO | Reduce the number of storm discharges from WOOLSTON EMO by a combination of SuDS and storage options | £49,210K | AMP11 | - | PO4 PO5 PO7 |

Drainage and Wastewater Management Plan: Location of Potential Options WOOLSTON Wastewater system in Test and Itchen 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.



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



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