



Problem Characterisation

Goddards Green (BURG)

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 Goddards Green wastewater system

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

Investment Strategy

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

Improve

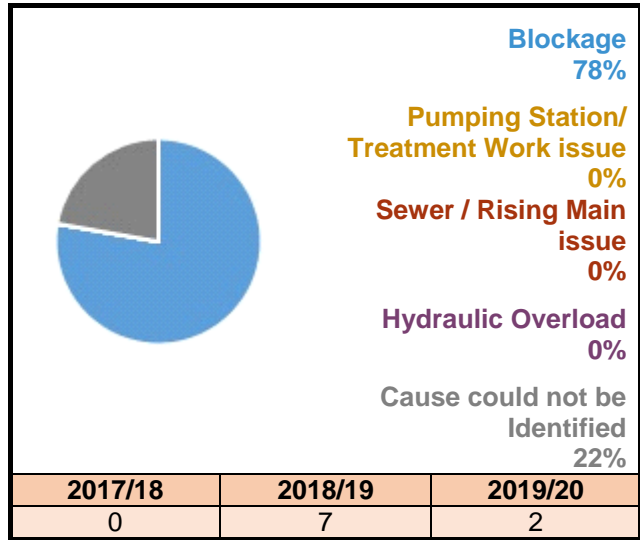
This means that we consider that the current performance of the drainage and wastewater system needs to be improved to reduce the impacts on our customers and/or the environment. We will plan investment to reduce the current risks by actively looking to invest capital funding in the short term to address 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 less than 1.68 incidents per 10,000 connections per year (a threshold set by Ofwat) so the risk is in the 'not significant' band.

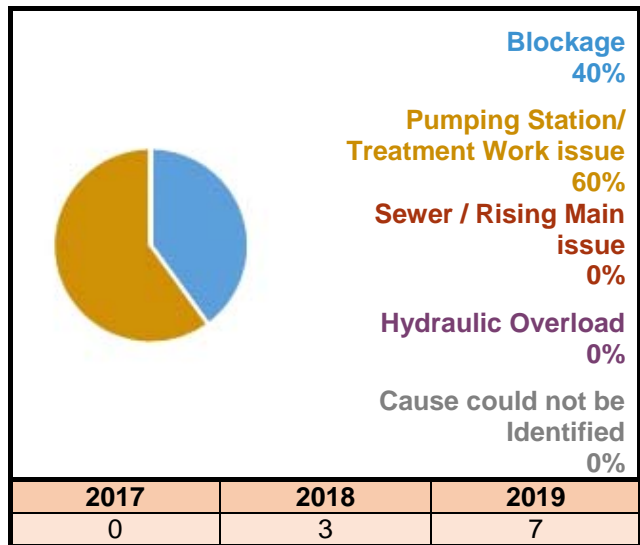
Figure 1: Number of internal flooding incidents per annum and causes



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.

Figure 2: Number of pollution incidents per annum and causes



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 60% of all incidents recorded in this wastewater system.

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 more than 9.44 incidents per 1,000km per year (a threshold set by Ofwat) so the risk is in the 'very significant' band.

Table 2: Sewer collapses and rising main bursts

Sewer Collapse	2017/18	0
	2018/19	4
	2019/20	2
Rising Main Bursts	2017/18	2
	2018/19	4
	2019/20	2

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

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 1100 - 1200 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 1600 - 1700 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	-	-	Less than 8	Between 8-10	10 or more
Bathing Waters	-	-	Less than 3	Between 3-10	10 or more
Freshwater	1 High 1 Medium	1 High 2 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 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 moderately significant in 2020. The risk The annualised

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	85	234	54	148
1 in 2	190	333	75	131
1 in 5	434	656	79	119
1 in 10	627	924	60	88
1 in 20	828	1248	40	61
1 in 30	1007	1484	33	49
Total Annualised			340	595



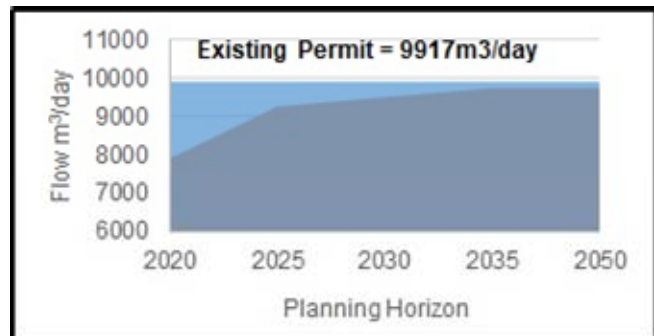
number of properties in areas at risk of flooding is shown in Table 4.

This indicates that the existing capacity of the wastewater network can be exceeded during 1 in 30 year storms (or more frequent events), and that the risk will increase due to future growth, creep and/or climate change by 2050.

Planning Objective 8: Wastewater Treatment Works Dry Weather Flow Compliance

The risk of Wastewater Treatment Works Dry Weather Flow Compliance is not significant for 2020 but is predicted to increase to very significant in 2050, shown in Figure 3. This is because the predicted DWF in 2050 is expected to exceed the current permit.

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



Planning Objective 9: Good Ecological Status / Good Ecological Potential

Table 5 shows the waterbody connected to this wastewater system 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 but has been moderated to not significant because of the presence of Tertiary Treatment at the wastewater system Treatment Works an implemented scheme in AMP6 as part of WINEP.

Table 5: Waterbodies not achieving GES/GEP

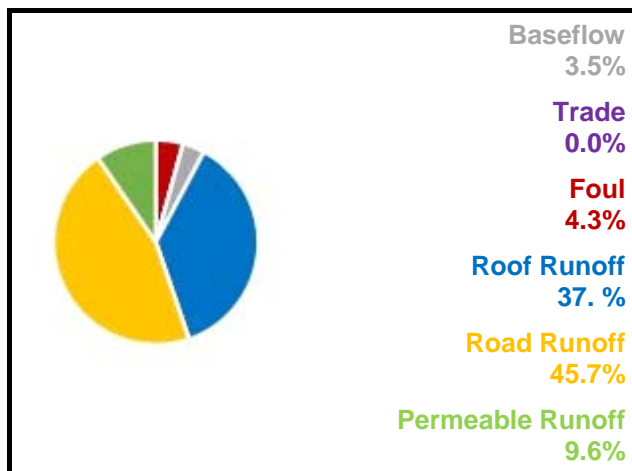
Waterbody	Classification	EA-Status	Activity
Adur (Burgess Hill)	Invertebrates	Poor	Sewage discharge (intermittent)
Adur (Burgess Hill)	Phosphate	Moderate	Sewage discharge (intermittent)
Adur (Burgess Hill)	Phosphate	Moderate	Sewage discharge (continuous)
Herrings Stream	Phosphate	Moderate	Sewage discharge (intermittent)
Adur East (Goddards Green)	Dissolved oxygen	Moderate	Sewage discharge (continuous)
Adur East (Goddards Green)	Invertebrates	Poor	Sewage discharge (continuous)

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 92.3% of the flow in the sewers. The total contribution of foul water from homes is 4.3%. The baseflow is infiltration from water in the ground and makes up 3.5% 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 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 do not impact on any designated shellfish waters.