Infiltration Reduction Plan

Winchelsea Beach

August 2025
Version 9.0

from
Southern
Water

Contents

Contents 2

Document Control 3

Glossary 4

1. Background 5

2. Groundwater Infiltration at Winchelsea Beach 7

2.1. The significance of groundwater infiltration 7

2.2. What would happen if Southern Water did not take action? 7

3. Investigation & repairs 8

3.1. Outline Plans to Investigate Sources of Infiltration 8

3.2. Investigation and Repairs in Winchelsea Beach 8

4. Mitigation measures 11

4.1. Circumstances that lead to mitigation 11

4.2. Steps to prevent discharges to the environment 12

5. Steps to minimise the volume and duration of tankering 13

5.1. 3rd Party Communications about mitigation measures 13

6. Options to Reduce Infiltration 14

6.1. Sewer Rehabilitation Programme 14

6.2. Property Level Protection 15

6.3. Local Flow Control 15

6.4. Pumping Stations 15

6.5. Monitoring 15

7. Action Plans 16

Appendix 25

Document Control

Version	Date
V1	November 2014
V2	13 March 2015
V3	21 July 2015
V4	20 November 2015
V5	March 2017
V6	March 2020
V6.1	September 2021
V7	January 2024
V8.1	July 2024
V8.2	September 2024
V8.3	October 2024
V9.0	August 2025

Glossary

AMP – Asset Management Programme
CCTV - Closed-circuit television
EA - Environment Agency
GW – Ground Water
IRP - Infiltration Reduction Plans
l/s - litres per second
MH – Manhole
RPS - Regulatory Position Statement
SW – Southern Water
WaSC- Water and Sewerage Companies
WC – Water Closet
WPS - Wastewater Pumping Station
WTW - Wastewater Treatment Works

1. Background

This Infiltration Reduction Plan (IRP) for Winchelsea in the Winchelsea Beach WTW catchment has been prepared in response to the Environment Agency's (EA) Regulatory Position Statement (RPS). Southern Water (SW) has been carrying out work for many years to survey and repair sources of infiltration in the catchment for Winchelsea Beach Wastewater Treatment Works (WTW) in Sussex.

Figure 1 provides a representation of the sewerage system that drains to Winchelsea Beach WTW. Flows are pumped northwards from Victoria Way Wastewater Pumping Station (WPS), where it joins other flows gravitating towards Morlais Ridge WPS. The resultant flows are pumped northwards from Morlais Ridge WPS to Winchelsea Beach WTW. The location particularly affected by sewer flooding is between Victoria Way WPS and Morlais Ridge WPS.

The sewerage system in Winchelsea Beach is designed as a 'foul only' system. Over time, surface water connections, or misconnections, have been added to the sewerage system which leads to overloading of the system during prolonged wet weather.

The repairs carried out by SW improve the integrity of the sewerage system. SW has been working with the following organisations and is dependent on their support to achieve the objective of reducing non-sewage flows into the sewers.

- Environment Agency
- Icklesham Parish Council
- Rother District Council
- East Sussex County Council
- Romney Marshes Area Internal Drainage Board
- Winchelsea Sands Flood Group
- Rye Bay and Winchelsea Sands Caravan Parks

Southern Water will continue to consult with representatives of these parties as part of the IRP development and implementation.

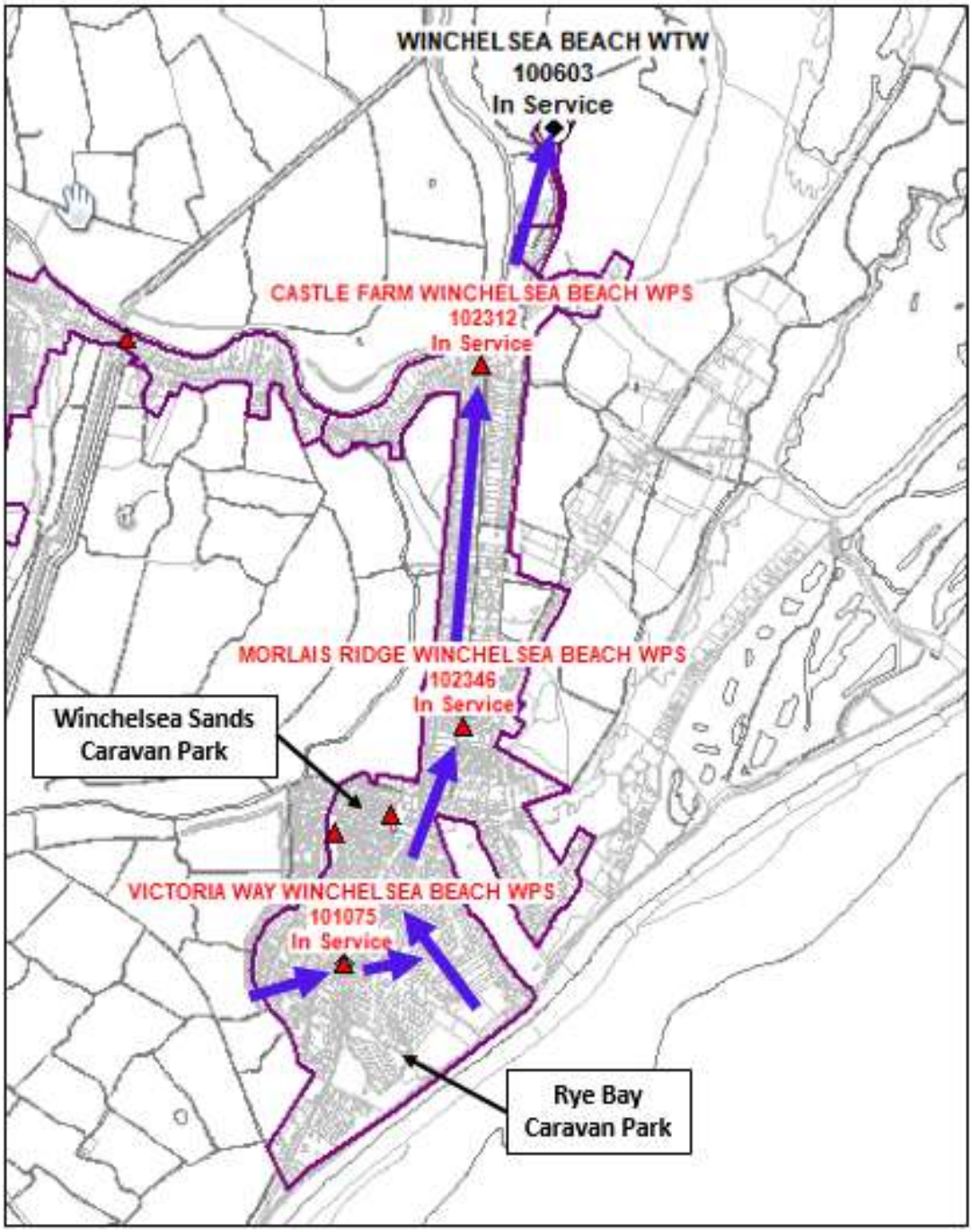


Figure 1 – Schematic showing the extent of the sewerage catchment

2. Infiltration at Winchelsea Beach

2.1. The significance of infiltration

Winchelsea Beach is one of a number of areas in Southern Water's operating area where, during excessively wet winters, customers have been inconvenienced by the effects of infiltration into sewers. Such effects can include flooding and restricted toilet use (RTU).

Southern Water strives to maintain services for customers by a programme of investigation, repair, maintenance and mitigation. Mitigation measures are by the use of tankers. Such mitigation measures are not sustainable and are disruptive to communities, so since 2014 SW has invested in carrying out major improvements to the integrity of the sewers and manholes in the vicinity of Winchelsea Beach in order to minimise the occasions on which mitigation measures are required.

2.2. What would happen if Southern Water did not take action?

Despite the significant infiltration flow through the catchment during these conditions, incidents of sewer flooding have been relatively infrequent. This is due to the mitigation provided during times of high groundwater. Flooding incidents would be higher if no tankering or mitigation measures were carried out. Table 2.1 below shows reported incidents of sewer flooding since 2011/12. For context, until the winter of 2023/24, 2012/13 was the wettest year on record and 2013/14 was the wettest winter on record.

Table 2.1 - Reported Flooding Incidents by Category in Winchelsea Beach

Reporting/ Financial Year	External Flooding (properties/ gardens)	External Flooding (highways/ other)	Internal Flooding	Restricted Toilet Use	Total
2011/12	1	0	0	0	1
2012/13	4	1	0	0	5
2013/14	15	1	0	0	16
2014/15	8	0	0	1	9
2015/16	6	1	0	0	7
2016/17	4	1	0	0	5
2017/18	0	1	0	0	1
2018/19	1	1	0	0	2
2019/20	12	3	0	0	15
2020/21	9	1	0	0	10
2021/22	0	0	0	0	0
2022/23	8	1	0	0	9
2023/24	9	11	0	0	20
2024/25	3	1	0	0	4
Grand Total	**80**	**23**	**0**	**1**	**104**

3. Investigation & repairs

3.1. Outline Plans to Investigate Sources of Infiltration

The Generic Plan describes Southern Water's Infiltration Reduction process. The specifics of the investigations and repairs at Winchelsea Beach are captured in Section 3.2 below, and includes the following elements:

- Manhole Inspections and CCTV Surveys
- Flow Monitoring Surveys
- Manhole and Sewer Repairs
- Follow-Up Surveys and Repairs

3.2. Investigation and Repairs in Winchelsea Beach

Infiltration into sewers has been a long-running issue for Winchelsea Beach. SW has been making significant investments over many years to minimise infiltration and the need for interventions such as tankering.

SW recently completed a major programme of survey and repairs to the sewers in Winchelsea Beach catchment. However, at times of very high soil saturation there are still significant challenges with the drainage system and there is more work to do. The investigations and repairs followed the process set out in the Generic Plan. The timing and status of each step is shown in Table 3.1 below.

Table 3.1 – Summary of Survey and Repairs at Winchelsea Beach

Step.	Description	Approx Date	Status
1.	Surveys were carried out on 1.2 km of sewer which identified a number of sources of infiltration in manholes and sewers in Dogs Hill Road and Morlais Place.	Summer 2014	Completed
2.	Repairs carried out across in manholes and sewers in Dogs Hill Road and Morlais Place.	March 2015	Completed
3.	Remedial pipe repairs at caravan parks.	Summer 2015	Completed
4.	Approximately 750m of sewer leading to the Victoria Way WPS was surveyed and about 360m of sewer upstream of Morlais Ridge WPS was surveyed	Jan 2018	Completed
5	Further sewer surveys (including investigations at caravan parks) and subsequent repairs	Summer 2021 – Spring 2022	Completed

Step.	Description	Approx Date	Status
6	Electroscan surveys of the public sewers	Summer 2022	Complete
7	Sewer repairs following electroscan	Summer 2023	Complete
8.	Installation of sewer level monitors at strategic points	2023	Completed
9.	Review of sewer level data to identify blockages and infiltration areas to target	From 2023, each season	Ongoing
10.	Review of optimal pumping strategy	Winter 2023/24	Complete
11.	Further Investigations of private drainage on caravan parks	Autumn 2024	Complete
12.	Review needed for more extensive approach to address infiltration in private sewers	From April 2025	Planned
13	Sewer rehabilitation	From April 2026	Planned

Despite the repairs, significant mitigation measures were required in winter 2023/24 due to the high saturation levels recorded. The majority of interventions were to tanker excess flow from the sewerage system and to take these to the Wastewater Treatment Works for full treatment prior to flows being returned to the environment.

Historically we have been dependent on waiting for soil saturation to increase and water to leak into the system to allow us to find leaks. This gives a very small window of opportunity between leaks starting and pipes running full and this caused repairs to be undertaken reactively or after the saturation had reduced. To overcome this, during 2021/22 a new survey technique called Electroscan was introduced to the business. This method of surveying is advantageous over traditional CCTV inspection as it allows surveys to be undertaken during dry and wet conditions and also identifies leaking joints in pipes that a visual survey would not pick up.

It is apparent from surveys undertaken over the years that there are at least two mechanisms at play here: sub-surface infiltration of water into the system mainly through leaking joints and inundation of rainfall into the system from surface flooding entering the system through drainage gulleys or private manhole covers. The root cause of the inundation issue may be due to changes to land drainage over the years as the area has been developed. It is apparent that the additional flow into the drainage system is arising from the privately owned sewers in addition to public sewers.

After having completed the sewer repairs identified through CCTV and Electroscan, SW has installed permanent sewer level monitors, pump loggers and a rain gauge within Winchelsea Beach sewer network. The data captured from these monitors will help to identify areas within the catchment where surface water and groundwater is entering the sewer. This will help to focus attention in areas of the catchment which are contributing excessive flows into the sewer network and support follow on remediation work for Southern Water to undertake and allow data led discussions with landowners.

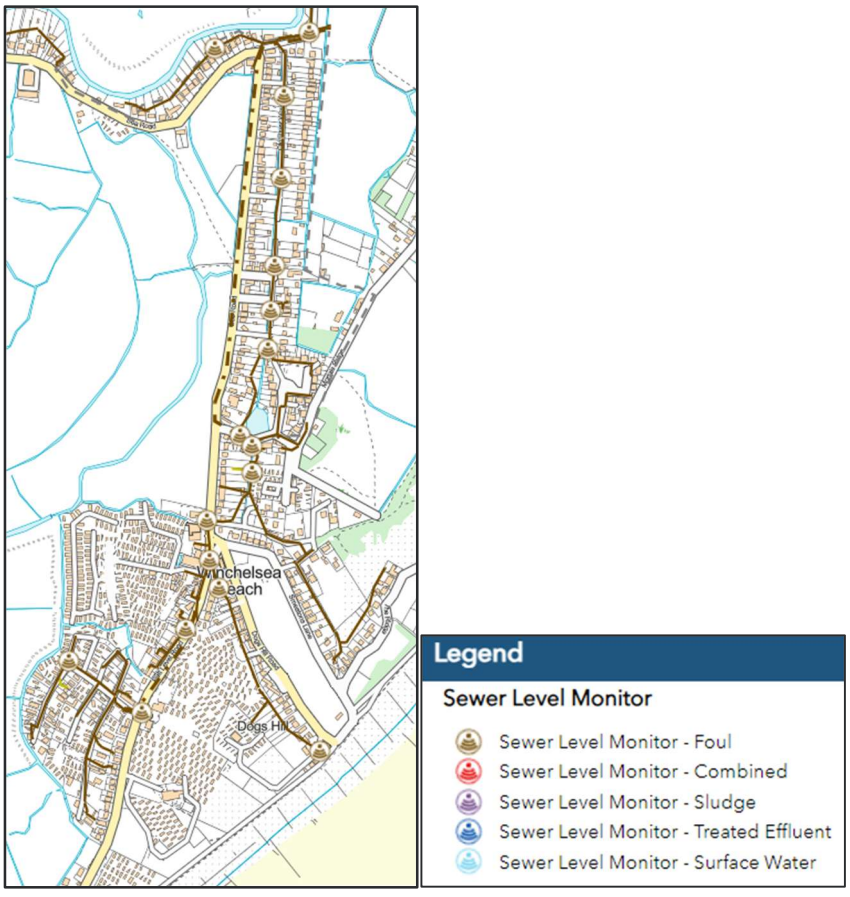
The critical pumping stations in Winchelsea Beach have received a health check prior to the winter season in previous years and these pumping stations will continue to receive similar health checks prior to the winter season. These health checks include inspections and maintenance to maintain optimum performance of the pumps to ensure the WPS achieves its design pass forward flow.

Historically there has been significant surface water from the two of the largest Caravan Parks entering the public sewers via private sewer networks. In summer 2015 both these parks have undertaken some remedial works. One of the caravan parks has repaired known pipe defects where infiltration was suspected to get into their private sewers. The other one has capped off known misconnections to the sewers and is undertaking ditch clearance works to allow the land drainage system within their site to function more effectively. There have been further manhole upgrade works and private land drainage improvement works done every year since 2015. Additional investigation works were undertaken in summer 2021 and due to the issues being experienced in winter 2023 further, more intensive investigations were understand the resistance of private drainage systems to groundwater and surface water inundation, with some sealing of the sewer network undertaken.

SW will continue to work with residents and local caravan parks to help reduce the amount of surface water entering our sewers via private sewer networks to identify pragmatic solutions. Further local engagement and monitors will be installed, to help develop a clearer understanding of the volume and location of surface water entering the Southern Water's network via private sewers.

Figure 3.2 shows the location of sewer level monitors that we have installed at strategic points around Winchelsea Beach. The monitors enable us to detect sewer issues such as high infiltration, blockages or sewer collapses. We are currently piloting the approach to understand how we can use that data to inform our sewer sealing programme. This is likely to include the use of Storm Harvester to target inspections to find infiltration.

Figure 3.2 – Location of Sewer Level Monitors in the vicinity of Winchelsea Beach



4. Mitigation measures

4.1. Circumstances that lead to mitigation

Since 2013, SW has made significant investment to reduce infiltration into the public sewerage system and to protect specific properties at risk of flooding. The objective is to reduce the frequency of discharges to watercourses and the disruption caused by the need to tanker flows from the system to larger wastewater treatment centres. In 2013/14 before any sewer sealing work had been completed to reduce infiltration, excess flows were initially extracted from the from the system and tankered to WTW sites for processing. In more extreme conditions where tankers were not able to cope with the flow rates, highly diluted wastewater flows were extracted from the sewer using suction pumps and the flow was overpumped into settlement and filtration groundwater treatment units, which allowed treatment of flow prior to discharge to local watercourses. This last resort technique to manage flows is no longer used in Winchelsea and the impact of excess flow is mitigated by tankering.

Once soil saturation levels have risen to a point where the sewerage system is below the water table, water will enter the system through leaking joints in both the public and private pipes and manholes. To ensure the sewerage system continues to function, this excess flow must be removed from the network. This is achieved by deploying tankers to Winchelsea Beach to extract flow from the sewers. This is then taken by tanker to Wastewater Treatment Works sites with capacity to treat the flow.

The locations for tankers are given in Appendix B.

Tankering is triggered by the wet well level at Morlais Ridge WPS and the level at which SW trigger the Emergency Action Plan (EAP) is shown in Figure 4.1. It has been observed that external flooding occurs in customer properties when the wet well level reaches about 70% and the EAP is triggered once the level in the wet well exceeds 70%. SW undertook a flow measurement survey at Winchelsea Beach during winter 2015. The survey provided better information about areas of high non-sewage flows. Further repairs were undertaken in 2015/16. SW completed another flow survey during winter 2016 to monitor the flow in the sewers in Winchelsea Beach and also understand the benefits of improvement works undertaken.

SW has now included Winchelsea Beach in the Winter Planning group. As part of this process the wet well levels and pump run time at Morlais Ridge WPS are regularly reviewed during periods of prolonged high groundwater.

Historical data showed that that deployment of tankers coincides with high wet well level at Morlais Ridge WPS, which is a result of heavy rainfall. In these situations, customers in Winchelsea Beach start experiencing restricted toilet use or flooding issues.

To provide effective drainage the initial response has traditionally been to provide tankers and to deploy these at strategic locations to manage water levels.

Consequently, SW propose to deploy tankers (ideally a maximum of two to minimise traffic congestion) to respond to a combination of high wet well level and customer complaints.

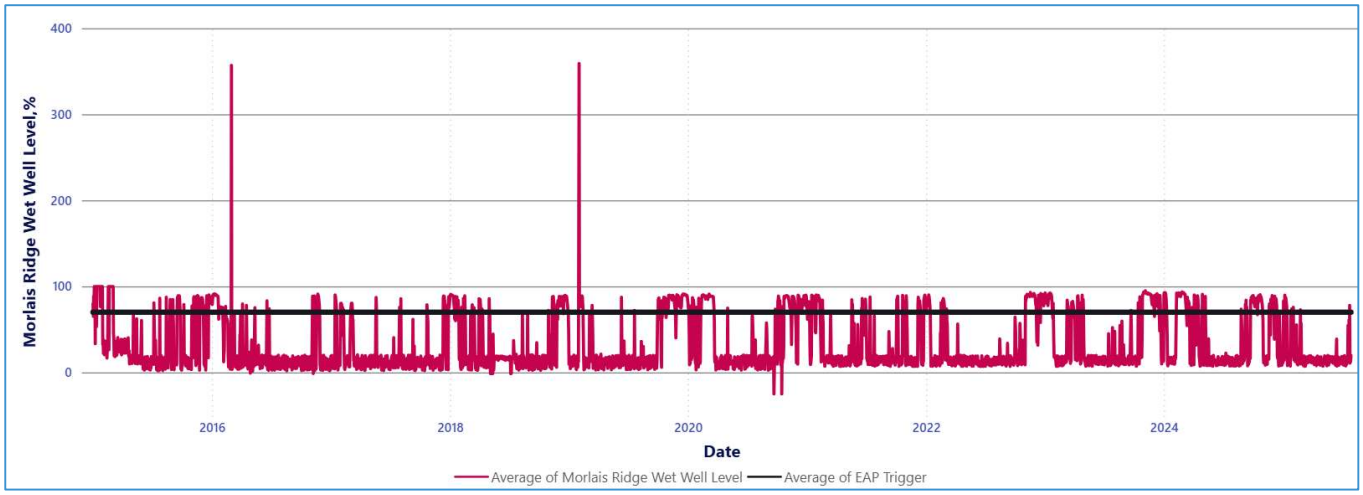


Figure 4.1 – Morlais Ridge Wastewater Pumping Station wet well level trends from 2015 to 2025

4.2. Steps to prevent discharges to the environment

The Generic Plan details the typical activities that Southern Water undertakes to minimise the requirement for discharges to watercourses. Since 2013, SW has undertaken extensive surveys and repaired sewers and manholes where infiltration had been found (the extent of the work is shown in Appendix A). This built on the repairs that had been carried out in previous years (shown in Appendix A).

Following the main repairs, further targeted repairs were completed.

5. Steps to minimise the volume and duration of tankering

5.1. 3rd Party Communications about mitigation measures

Since the start of the Infiltration Reduction Programme in 2013, Southern Water has been active in communicating with stakeholders and customers about planned and completed work to improve the integrity of the sewerage system. Stakeholders have been kept informed of progress on survey and sealing work via emails and or face-to-face meetings. However, we recognise there is more to do in this area to keep everyone informed of the mitigation measures that may be required and informing when we have deployed the measures.

SW will attend and convene meetings with local groups to ensure progress against the plan and the on-site mitigation activity is clearly communicated. Meetings that have been held over the last 10 years with local council and EA representatives have been influential in helping to shape the IRP. The latest version of the IRP approved by the EA, will be published on SW's website.

From time to time, SW updates stakeholders about completed and planned work, as part of stakeholder meetings with the local councils.

6. Options to Reduce Infiltration

6.1. Sewer Rehabilitation Programme

It is recognised that infiltration reduction is an on-going process. Since 2013, SW has undertaken surveys and repairs to the public sewers in Winchelsea Beach. In recent activity in systems prone to high groundwater in Hampshire and Sussex, we have undertaken more investigation into the contribution of flows from the private sewer network. We have established through the Pathfinder projects that groundwater is just as likely to be entering the system through leaking private pipes and manholes as the public system. This is probably not surprising as the systems would have originally been laid at the same time using the same techniques. The only difference is that as a rule the private sewers are likely to be at a shallower depth and groundwater has to rise slightly higher for infiltration to start. Now that the majority of the identified leaks on the public system have been addressed we will need to start sealing sewers in the private system.

Appendix A contains details of all sewer inspection and remedial work undertaken to date.

Table 6.1 below summarises the work undertaken in the system since 2014, table 6.2 provides an annual summary.

Action	Km of sewer
Length Surveyed (CCTV)	4.36
Length Surveyed (Electroscan)	1.62
Length with no work required	1.20
Length Sealed	3.32
Length to be sealed	0.474
Manholes sealed	4
Manholes to be sealed	1

Table 6.1 - Work undertaken since 2014 at Winchelsea Beach

Year	Length Surveyed (km)	Length repaired (km)
2014	2.1	0.1
2015	0	0
2016	0	0
2017	0.6	0.3
2018	0.3	1.1
2019	0	0.2
2020	1.26	0
2021	0.1	0
2022	1.62	0.6
2023	0	0.2
2024	0	0.4
2025	0	0.4

Table 6.2 – Annual summary of work completed

From work undertaken to date which has resulted in the majority of the public system now being sealed it is apparent that a large flow is entering the system from private drainage systems. In our business plan for the period 2025- 2030 we have included for extensive work to be undertaken to investigate and seal the private drainage systems leading to the public network. We intend to deliver this during 2025 and 2026 and then monitor the effectiveness over the later years in the business plan period.

6.2. Property Level Protection

Non Return Valves (NRVs) have always been part of our method for dealing with the consequences of infiltration, but they are only effective if infiltration is under control on both the lateral and the main sewer. Having completed the current phase of rehabilitation work, which has improved the integrity of the main sewers, the potential for using more property level NRVs to isolate individual properties or groups of properties is being investigated, with the objective of reducing the requirement for tankering.

6.3. Local Flow Control

Tankering has been required on selected dates during all winters where groundwater levels have impacted levels of service. Full details are given in Appendix B.

6.4. Pumping Stations

In order to minimise infiltration, SW is continuing to ensure that design discharges are maintained at pumping stations. This will help to ensure that the design discharge continues to be reliably delivered.

6.5. Monitoring

Winchelsea Beach catchment is one of ten locations, where groundwater levels have been monitored via electronic data since January 2015. This monitoring helps inform SW's response, in terms of when tankering are required. The Generic Plan has more detail on the overall monitoring strategy.

The graph in Figure 4.1, is used to predict the timing of an operational mitigation activity to reduce the risk of flooding and pollution incidents.

In addition to the groundwater flooding forecasts explained above, SW is also looking at longer-term trends to monitor the effectiveness of the completed rehabilitation work.

Morlais Ridge WPS serves the worst affected sub-catchment in Winchelsea Beach. As it can be observed from the graphs, the wet well level at this pumping station reacts very quickly to rainfall event, i.e. there is a quick increase in the wet well level and it reaches 100% capacity during periods of heavy rainfall. The system was designed as 'foul-only' hence, it is quickly overloaded when it receives increased rainfall related flows such as surface water or rainfall induced infiltration.

It is quite normal for wet wells to fill, but if incoming flows continue to increase, the capacity of the pumps will be exceeded. Once this occurs the upstream sewers start to surcharge. SW has investigated whether the output of the pumps can be increased slightly. However, the pipes into which they pump (rising mains) and treatment works are all part of an integrated system. Consequently, it is not always possible to modify any one in isolation. Once the capacity of the pumps is exceeded, customers may start to experience flooding or restricted toilet use issues. Consequently, SW has taken steps to reduce infiltration; also with the input of other parties, SW is expecting surface water flows in the sewers to be reduced. Recent monitoring of the performance of the catchment shows the duration during which the wet well level at Morlais Ridge WPS stays high following rainfall events, has considerably reduced.

7. Action Plans

A significant amount has been achieved in the Winchelsea Beach catchment in the last ten years. Some actions are ongoing which reflects the continuous improvement process for dealing with infiltration due to groundwater. To make it easy to track progress, the following tables set out the actions to reduce infiltration and also to mitigate the effects of it, if the infiltration cannot be controlled at economic cost. Tables 7.1 and 7.2 cover the actions by SW and by other parties, respectively, to reduce infiltration. Tables 7.3 and 7.4 cover mitigation of the effects of flooding (Communication and other activities).

SW is committed to continuing to pursue infiltration to reduce the frequency of service impacts and mitigation measures. This IRP describes the work that has been done by SW to improve the situation. In addition, it also describes what is being done to monitor flows, the 'winter preparation' work to be carried out to ensure assets are operating correctly, and the work to be developed with other agencies to improve an integrated plan to address flooding.

Colour coding of actions in tables:

- Green – completed
- Orange – in progress
- Red – overdue
- White – on-going actions with no specific end dates.

Table 7.1. Southern Water Current Activities to Reduce Groundwater Infiltration

Ref.	Item	Actions	Timescale and Status	Outcomes
1.1	Develop an approach for reduction of infiltration and maintenance of reduced levels of infiltration.	Refer to Section 1 above.	Summer 2013, Complete	The steps are being followed to deliver results.
1.2	CCTV etc survey of sewers	Identify Strategic Manholes; survey MHs to identify clear flow and infiltration. Carry out CCTV survey where clear flow was identified.	Spring 2014, Complete	Successful survey will identify major sources of infiltration to determine scope of rehabilitation work.
1.3	Carry out sewer rehabilitation work	Use various techniques to seal infiltration points in manholes and sewers.	2014/15. Complete	Rehabilitation will restore the structural integrity of the sewers.
1.4	Further surveys (CCTV or alternative techniques), if required,	Further surveys and investigation if required.	Spring 2015. Complete	Determine scope and carry out further surveys if identified as required from the initial survey results.
1.5	Sewer rehabilitation work, if required, in areas where surveys carried out.	Use various techniques to seal infiltration points in manholes and sewers	Winter 2015. Complete	Rehabilitation will restore the structural integrity of the sewers.
1.6	Consider alternative solutions to enhance customer service	Investigate following completion of planned rehabilitation works completed as per 1.5 above.	SW, 2016. Complete	Cost-effective. Enhanced customer service.
1.7	Maintain IRP as a live document	Review IRP as appropriate to describe work carried out and/or developments	Annual review of the IRP	The EA requirement is for the IRP to be reviewed annually, to be published prior to groundwater season.

Ref.	Item	Actions	Timescale and Status	Outcomes
1.8	Quarterly progress reports	A progress report on infiltration reduction work related to this catchment will be submitted to the Environment Agency	Quarterly	Keep the Environment Agency informed of progress on a regular basis
1.9a	Strategy for inflows via private drains	Southern Water to propose a strategy for dealing with infiltration via private drains*	SW , Complete	Southern Water's objective is to improve awareness of the significance of infiltration into private drains and the importance for customers to ensure infiltration is repaired when it is discovered.
1.9b	Flow Survey	Undertake a flow survey of the catchment to understand the inflow from different areas of the catchment.	SW, Winter 2015. Complete	To identify areas that are contributing excessive flows into the sewers.
1.9c	Consider alternative solutions that involve some risk	Investigate unconventional options such as vacuum sewers or consider conventional combined sewer overflows	Complete	No alternatives identified
1.10	Electro Scan Survey	Undertake an Electroscan Survey of the incoming main sewer to the south of Morlais Ridge WPS.	SW, Winter 2016. Complete	Survey identified sources of infiltration in this part of the network.
1.11	Sewer rehabilitation work in areas where Electro Scan survey carried out.	Use various techniques to seal infiltration points in manholes and sewers	Year 3 Amp 6. Complete	Rehabilitation will restore the structural integrity of the sewers.
1.12	Flow Survey	Undertake another flow survey of the catchment to understand the inflow from different areas of the catchment.	SW, Winter 2016. Complete	To understand the benefits following works undertaken in the catchment and identify areas that are still contributing excessive flows into the sewers.

Ref.	Item	Actions	Timescale and Status	Outcomes
1.13	ElectroScan Survey	Undertake Electro Scan Survey of sewer leading to Victoria Way WPS	SW, Winter 2017. Complete	Survey identified sources of infiltration in this part of the network.
1.14	Sewer rehabilitation work in areas where Electro Scan survey carried out.	Use various techniques to seal infiltration points in manholes and sewers	Year 4 Amp 6. Complete	Rehabilitation will restore the structural integrity of the sewers.
1.15	Manhole, sewer and lateral CCTV surveys	Undertake surveys of manholes, sewers and laterals to identify infiltration.	Summer/ Autumn 2021	Complete – Appendix A
1.16	Caravan park surveys	As above	Summer/ Autumn 2021	Complete – connectivity and flow data captured
1.17	Sewer Rehabilitation	Use various techniques to seal infiltration points in manholes and sewers	Summer 2022/23	Completed for the public sewers
1.18	Intensive surveys of private drainage	Planned to commence in 2024	2024-2025	Approval from landowners required
1.19	Review effectiveness of any sealing work	Analyse monitoring data and groundwater data to determine benefit of investment.	From Spring 2024	Pending High groundwater
1.20	Review need for further repairs to public and private sewers	Consider further improvements	Spring 2025	Enhancement programme to seal estimated 20% of entire sewer network
1.21	Sewer rehabilitation to prevent infiltration	Sewer sealing, relining and repairs	From April 2026	Planned

Table 7.2. Multi-Agency Activities to Reduce Groundwater Infiltration

Ref.	Item	Actions	Owner, Timescale and Status	Outcomes
2.1	Investigate highway and private road 'mis-connections'	Where non-sewage flow is identified, check highway drainage relative to sewers to ensure road drainage is not a source of flow into the SW sewers	East Sussex County Council, Rother District Council and Winchelsea Sands Holiday Park owner with support from SW, 2015. Complete.	Reduced flow of surface water (if connections are found).
2.2	Groundwater investigation on customers' drains	Where non-sewage flow is identified from customers' properties, investigate to identify source of flow into SW sewers	SW, with assistance from Rother District Council where required, Ongoing.	Reduced flow of surface water (if connections are found).
2.3	Consider effects of proposed new developments on infiltration.	District Council to continue to consult with SW on development applications.	Rother District Council, Ongoing	Rother Distinct Council consults on most applications including extensions, but this is not obligatory; SW is not a statutory consultee. SW would like to be consulted on everything that will have a discharge to a public sewerage system. Developments in areas which would be detrimental to sewer flooding, to have conditions recommended by SW and applied, as appropriate, by the District Councils.
		SW to determine threshold above which they require to be consulted.	SW	
		Sewerage materials for new developments	SW, Rother District Council	
2.4	Long-term Monitoring	SW will monitor sewer flow to identify significant increases in inflows.	Ongoing	Early identification of areas where infiltration has increased

*Note: Southern Water does not have powers to require residents to repair private drains. Hence the support of the other agencies is required. It is acknowledged that customers may not be aware of infiltration in their private drains, so SW will consider ways of obtaining information to demonstrate the presence of infiltration. District Councils would only be able to instigate action under Section 59 of the Building Act where proof/evidence is provided of the defect.

Table 7.3. Publicity / Communication Activities to Reduce / Mitigate the Effects of Groundwater Infiltration.

Ref.	Item	Actions	Owner, Timescale and Status	Outcomes
3.1	Public meetings about reducing groundwater infiltration other non-sewage flows into sewerage system	Attend public meetings with other agencies/ organisations as appropriate to communicate to customers and stakeholder's progress and planned activities.	SW, ESCC, as required	Inform local population of progress and planned activities and receive feedback.
3.2	Liaise with other agencies as appropriate.	Discuss and agree actions to reduce requirements for tankering and emergency discharges to watercourses.	SW, ESCC, RDC, RMIDB, EA, IPC.	Improved understanding of issues and appreciation of issues. Agreement to actions to help reduce the need for tankering and emergency discharges to watercourses

** SW can provide base information to councils to include in articles publicising the role that everyone can play in minimising non-sewage flows into sewers, and the importance of doing so to reduce the incidence of restricted toilet use during periods of high groundwater.

Table 7.4. Activities to Mitigate the Effects of Groundwater Infiltration/ Other Flood Protection Mechanisms

Ref.	Item	Actions	Owner, Timescale and Status	Outcomes
4.1	Early Warning system	Joint continuous monitoring of sewer levels/flows.	SW, EA, 2015, Complete	Develop trigger levels by comparing historic customer complaints and tankering with BH levels (or other reference). Note trigger levels should vary as a consequence of rehabilitation.
4.2	Tankering arrangements	Investigate options for improving location of tankers and over-pump units for future events. E.g. by use of longer hoses/ pumping	SW, 2015, Complete.	Potentially less disruption to residents when tankering / pumping is essential.
4.3	Maintenance of watercourses	Riparian owners to carry out their responsibilities to maintain adequate flow through watercourses by clearing vegetation, desilting, etc	Riparian owners with input from District and Parish Councils – ongoing responsibility	Maximise the flow along watercourses in order to minimise surface flooding, which results in inundation of manholes to the sewerage system.
4.4	Integrated Approach to reduce sewer flooding	Develop a multi-agency approach to the management of sewer flooding within the catchment	East Sussex County Council/Rother District Council, with inputs from SW, EA and Parish Councils	Actions for participating authorities that in unison, will reduce the extent of flooding and the impact of flooding.

Table 7.5. Activities required if Groundwater Infiltration cannot be adequately reduced at reasonable cost (BTKNEEC)/ interim arrangements.

Ref.	Item	Actions	Owner, Timescale and Status	Outcomes
5.1	Groundwater treatment sites: improve effluent quality	Investigate potential for improved screening and basic treatment at points of discharge into watercourse.	SW, 2014, Done	Improved arrangements for discharges when required.
5.2	Groundwater treatment sites: minimise flow	Add level control to pumps to reduce durations for pumping	SW, 2014, Done	Establish whether seasonal discharge (s) will be necessary in order to maintain use of sewerage services for customers during periods of very high groundwater levels.
5.3	Standards for emergency discharges	SW to discuss with EA about best practice set up for groundwater treatment arrangements.	SW, 2014, Done	Agree with EA acceptable standards for discharges and acceptable flow rates.
5.4	Flow, location, screening arrangements for emergency discharges	Determine potential flow rates and screening arrangements and most appropriate locations,	SW, Done	Agree with EA, County Council and local Parish Councils acceptable arrangements for future emergency discharges.
5.5	Action Plans	Develop SW action plans documenting set up of pumps, tankers, etc. for emergency situations.	SW, 2014 , Done	Action Plan available for planning sessions with other authorities in preparation for repeat flooding events. Engagement with the local community about the potential arrangements for dealing with excess flows into sewers to mitigate disruption to customers.

Ref.	Item	Actions	Owner, Timescale and Status	Outcomes
5.6	Implementation of Action Plan	SW to implement action plan when trigger point is reached, i.e. high wetwell and customer reports flooding during rainfall event.	SW, as required	Tankers to be deployed and situation monitored. Consult EA and other stakeholders if situation doesn't improve.

Appendix

A Survey Findings and Rehabilitation Scope – completed work

B Tankering and Emergency Discharge Sites