Dŵr Cymru
Welsh Water

Event Duration Monitoring

Trigger Exceedance Notification

Document ID

Report type: Stage 2: Full Investigation Proposal

Permit Number: BP0237412

Receiving / Impacted waters: BW5

Location: CSO 121 at Sandfields Pumping Station (Outfall 'L')

DCWW Asset ID: 51148

CAR References: CAR_NRW0049460

Document Control

Version	Status	Date	Author(s)	Description of Change
1	Stage 2: Full Investigation Proposal - Draft	19/05/25	J. Turner	
1	Stage 2: Full Investigation Proposal - Draft	15/04/2026	G Griffiths	
1	Stage 2: Client Manager Sign-off	30/04/2026	David Keen	Changes to Action completion date.
	Please Select			
	Please Select			
	Please Select			
	Please Select			
	Please Select			
	Please Select			
	Please Select			
	Please Select			
	Please Select			
	Please Select			
	Please Select			
	Please Select			
	Please Select			
	Please Select			
	Please Select			
	Please Select			
	Please Select			
	Please Select			

Table of Contents

1. Summary of Each Stage

This TEN document follows the six Spill Frequency Trigger stages as detailed in the "*Water and Sewerage Company actions following a spill frequency trigger permit condition exceedance*" guidance document (GN005) to comply with the associated permit conditions.

The permit for asset is CSO 121 at Sandfields Pumping Station (Outfall 'L') BP0237412. The EDM classification for this asset is Bathing Water and has a limit of 5 spills. The asset exceeded its EDM requirements on the 6th of September 2024 when it spilt for the 6th time as per the Spill Block Counting Method.

Initial desktop studies and operational investigations have identified the root cause to be Hydraulic Overload. We have already undertaken the maintenance related tasks in the previous exceedances.

Detailed root cause analysis, optioneering and solution development is currently being carried out.

1.1. Stage 1: Spill Frequency Trigger Summary

- Permit Number BP0315201 = BW 5 spills in a year (as per the spill block counting method)

TEN History:

Year	2022	2023	2024	2025	2026	2027	2028	2029
TEN ?	Yes	Yes	Yes	-	-	-	-	-

- Stage 1 Acceptance of the TEN by DCWW 04-10-2024.

1.2. Stage 2: Initial Investigation Summary

Through desk top analysis & onsite investigation, detailed Root cause could not be determined.

2. Stage 2: Initial Investigation

2.1. Site Location

The area of Sandfields is a low-lying area adjacent to and immediately west of Swansea city centre.

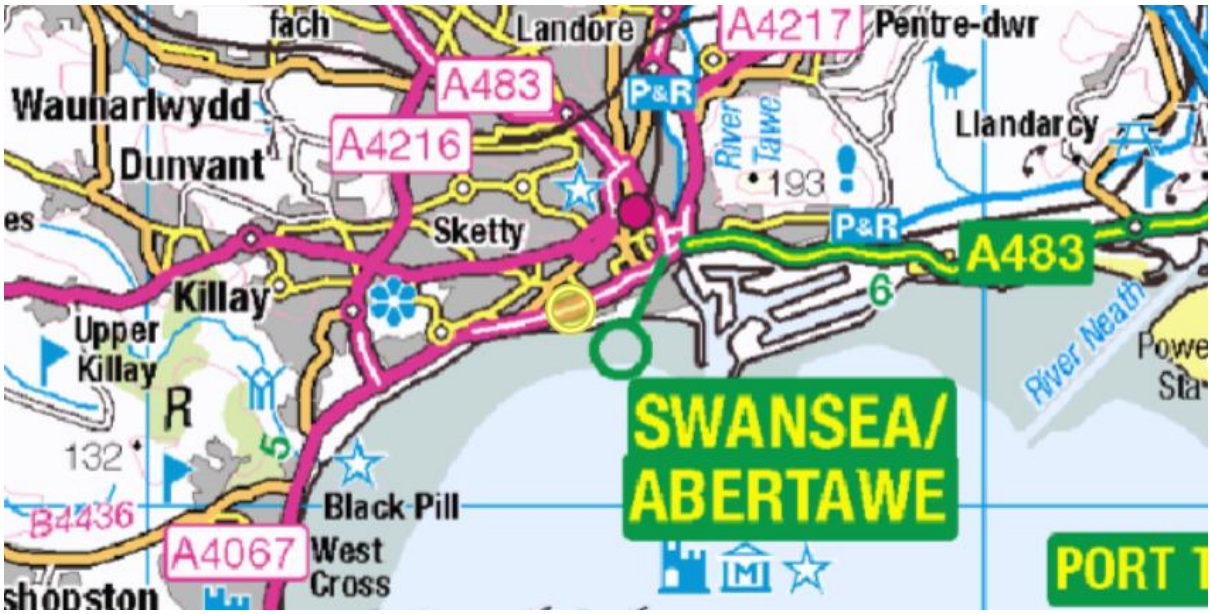

Figure 1: Location of CSO 121 at Sandfields Pumping Station (Outfall 'L')

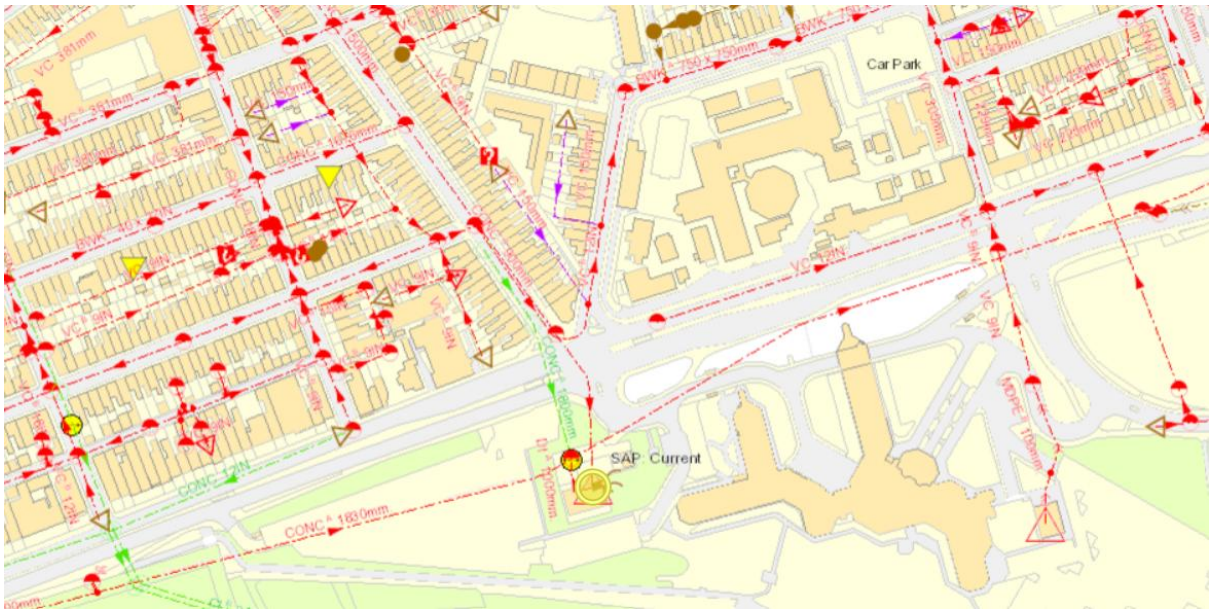

Figure 2: CSO 121 at Sandfields Pumping Station (Outfall 'L') and surrounding Network

2.2. Permit & EDM Requirements

Schedule 3 – Emissions and monitoring

Table S3.1 Point Source emissions to water (other than sewer) – emission limits and monitoring requirements

Effluent and discharge point	Parameter	Limit (including unit)	Reference Period	Limit of effective range	Monitoring frequency	Compliance Statistic
Storm sewage via POINT OF DISCHARGE	Discharge start and end times	N/A	N/A	N/A	Whenever a discharge occurs	N/A
	Block-counted significant spills	5 spills	15th May to 30th September inclusive	N/A	15 minutes	Condition 3.1.2 applies - the spills threshold is a trigger for investigation only and not a statistic for use in compliance of asset
	Block-counted spills	N/A	15th May to 30th September inclusive	N/A	15 minutes	N/A
	Block-counted spills	N/A	1st January to 31st December inclusive	N/A	15 minutes	N/A
	Event recorder status operational	N/A	N/A	N/A	15 minutes	N/A

Table S3.2 Discharge points

Effluent Name	Discharge Point	Discharge point NGR	Receiving water/Environment
Storm sewage	POINT OF DISCHARGE	SS 65020 92060	Estuarial waters of Swansea Bay

Table S3.3 Storm sewage discharge settings

Effluent and discharge point	Description of discharge	Overflow setting l/s	Maximum size of solid matter	Screen aperture size
Storm sewage via POINT OF DISCHARGE	Storm sewage	1,300	No greater than 6 mm in more than 1 dimension	6 mm x 6 mm

Table S3.4 Monitoring points

Effluent and discharge point	Monitoring type	Monitoring point NGR	Monitoring point reference
Storm sewage via POINT OF DISCHARGE	Effluent sampling	SS 65063 92362	POINT OF OVERFLOW
	Event duration monitoring	SS 65063 92362	

Figure 3: CSO 121 at Sandfields Pumping Station (Outfall 'L') Discharge Permit Details

2.3. Asset and Telemetry Description

Sandfields SPS CSO receives flows from an area consisting of the Sandfields, Uplands and Mount Pleasant areas. The catchment upstream of this consists of mainly residential properties covering an area of approximately 1.00sq. km predominantly drained by combined sewers. The asset was originally constructed as part of the Sandfields Surface Water Flooding strategy in 1970's. It was subsequently converted to a foul and surface water pumping station at a later (unknown) date, before being modified into its current configuration as a pumped CSO as part of the Swansea Urban Wastewater Treatment Directive Project(s) of the late 1990's. The asset forms part of a series of assets in the wider area that may be reconfigured to divert flows via a series of flow control devices, thus it is possible for Sandfields SPS CSO to receive flows from a far wider catchment area should it be required.

Discharges are monitored by an ultrasonic level detector, used for EDM purposes. PFF is controlled by a penstock in the CSO stilling and screening chamber. Flows enter the SPS from the combined network inlet sewer. Flow gravitates through the pumping station and into the adjacent interceptor trunk sewer passing Easterly through the asset compound.

If the flow coming into the CSO exceeds the capacity of the downstream flow control, a spill occurs due to the downstream network surcharge. Spill flows pass up, through the screen and over the weir and gravitates to the discharge point via the long sea outfall. If there is a high tide and the outfall becomes hydraulically locked, flow enters the storm pump sump, and the pumps lift flows to create sufficient hydraulic head to pass flows down the outfall.

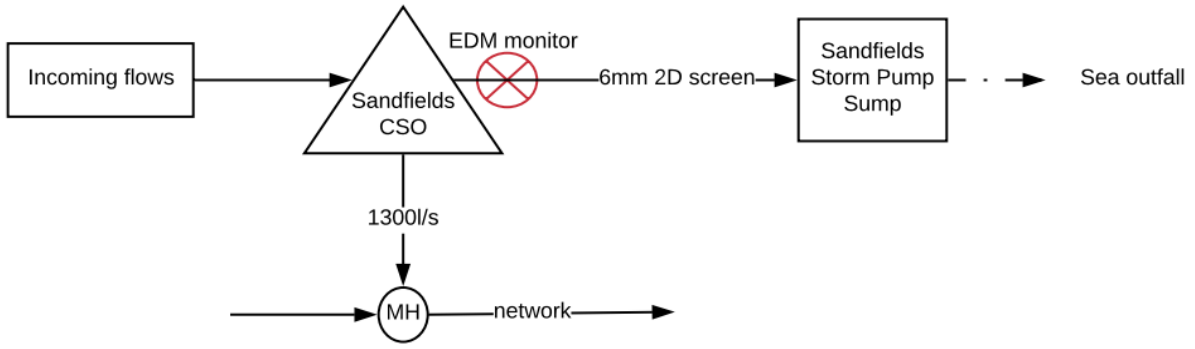

Figure 4: SPS Configuration

Figure 5: Internal View of Screen Chamber

2.4. Telemetry Data Analysis

3. Bathing Water spills occurred from 18/05/2024 – 06/09/2024 as shown in the screen shot below (Figure 6) taken in from Scopex / Prism telemetry data.

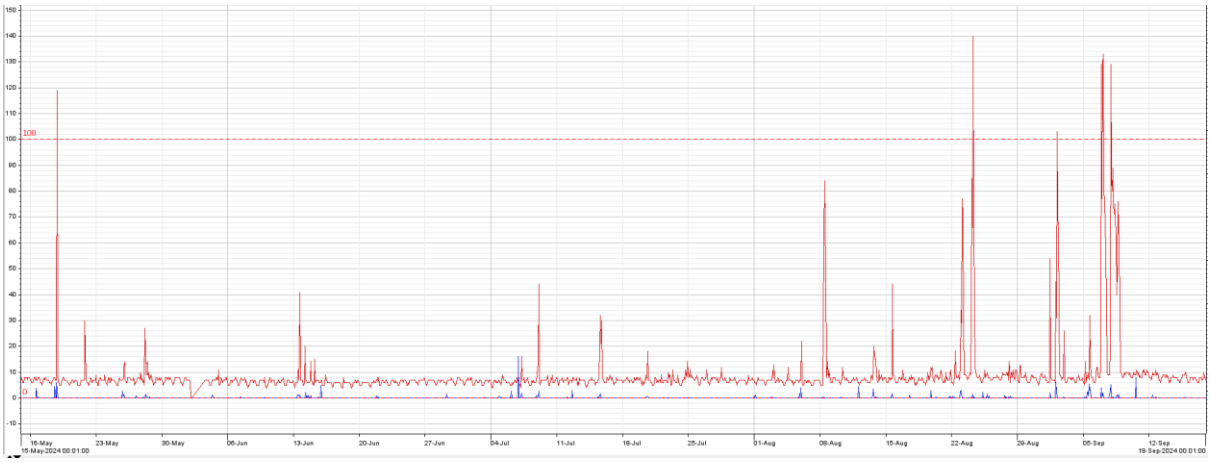

Figure 6: Scopex / Prism telemetry data.

Figure 6: graph showing –

= CSO Levels = Rainfall Intensity

3.1. Root Cause Statement

A detailed Root cause cannot be determined at this stage, however there are concerns over the reliability of the data due to the current location of the EDM monitor. Assessment to be carried out to move EDM monitor to spill channel, currently reading off the screen level monitor.

The following graph shows the level in the channel in meters compared with the spill as %. There seems to be a scaling issue as the red and blue lines are not trending together. From this and by noting no flat profiles when spills have been recorded to occur, it is likely that the monitor isn't working as it should and the spill was unlikely to have happened.

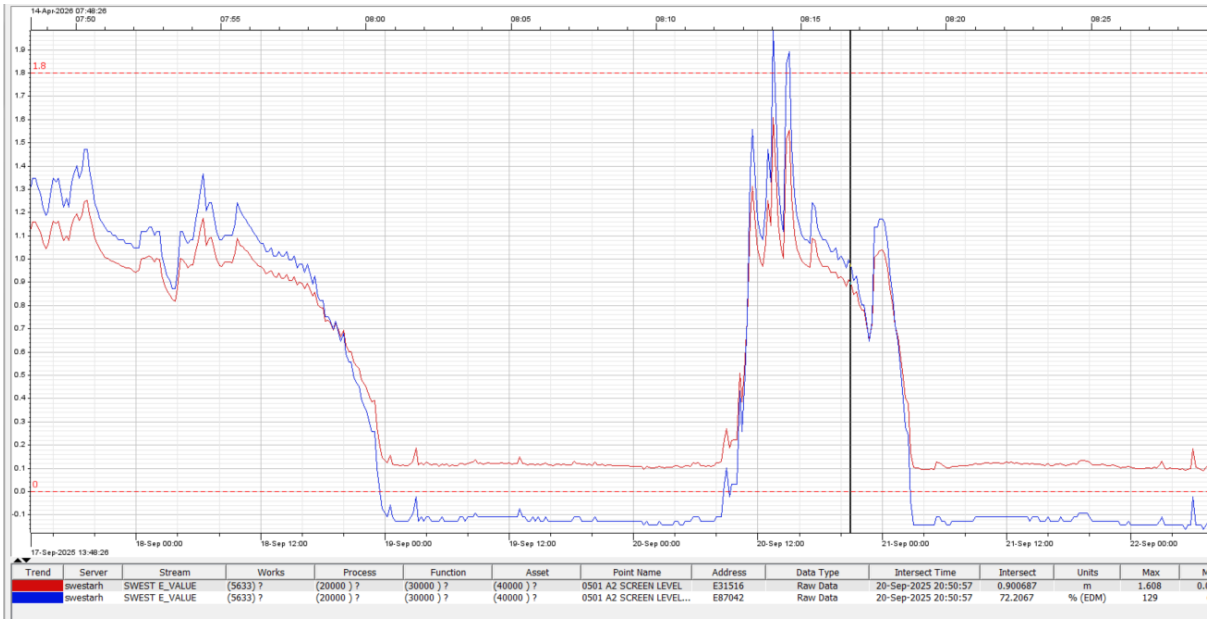

Figure 7: Scopex / Prism telemetry data.

3.2. Stage 2: Next Steps

Detailed root cause analysis, optioneering and solution development is currently being carried out.

3.3. Stage 2 Full Investigation Plan

Table X: Full Investigation Plan

Action Ref.	Action Required	Action Due Date	Comments	Complete (Y/N)	Completion Date
1.	Setup and calibrate new EDM Monitor	30/09/2026			
2.	Hydraulic modelling exercise to be undertaken.	30/01/2027			

4. Stage 3: Trigger Exceedance Reason Report (TERR)

5. Stage 4: Spill Reduction Plan

5.1. Spill Reduction Proposal

Identifies how the number of spills will be reduced. The plan must contain reasonable deadlines and be sent to NRW for approval.

Complete Stage 5 which details our communication plan with NRW during the implementation of the SRP.

Table X: Spill Reduction Plan

Action Ref.	Action Required	Action Due Date	Comments	Complete (Y/N)	Completion Date

6. Stage 5: Implement Solutions

6.1. Stakeholder Communication

NRW will be updated via local quarterly meetings and CAR process.

7. Stage 6: Close Out Report

7.1. Spill Reduction Performance

7.2. Trigger Exceedance Close Out Statement

8. Appendices

8.1. Appendix A: Acronyms/Abbreviations

Acronym/Abbreviation	Meaning
AMP	Asset Management Plan
CSO	Combined Sewer Overflow
DWF	Dry Weather Flow
DCWW	Dwr Cymru Welsh Water
EDM	Event and Duration Monitoring
FFT	Flow to Full Treatment
NGR	National Grid Reference
PFF	Pass Forward Flow
SAS	Surplus Activated Sludge
SOAF	Sewer Overflow Assessment Framework
SPS	Sewage Pumping Station
SRP	Spill Reduction Plan
STMF	Storm Tank Flow
STMRF	Storm Tank Return Flow
TEN	Trigger Event Notification
WWTW	Wastewater Treatment Works