DŴR CYMRU WELSH WATER

EVENT DURATION MONITORING

November 2023

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EDM TEN Investigation Initial Report – BW4102301 Furzeland Drive CSO, Sketty, Swansea

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DOCUMENT CONTROL

Version	Status	Date	Author(s)	Description of Change
1	Initial draft	24/11/2023	A. Moule	Initial Report Draft
1	Draft Check approved	27/11/2023	G. Griffiths	Asset Manager review
1	Client Manager (Delegated) Review	20/02/2024	Helena Hopkins	Review and Approval of Initial Report

Abbreviations

EDM……	**Event and Duration Monitoring**
DCWW……	**Dwr Cymru Welsh Water**
SOAF…….	**Sewer Overflow Assessment Framework**
AMP……	**Asset Management Plan**
TEN……	**Trigger Event Notification**
CSO……	**Combined Sewer Overflow**
SPS……	**Sewage Pumping Station**
WWTW……	**Wastewater Treatment Works**
DWF……	**Dry Weather Flow**
PFF…….	**Pass Forward Flow**
STMF……..	**Storm Tank Flow**
STMRF……..	**Storm Tank Return Flow**
FFT…….	**Flow to Full Treatment**
SAS……	**Surplus Activated Sludge**

1. Executive Summary

Furzeland Drive CSO is permitted to discharge under Permit BW4102301 to a culverted section of an un-named Tributary of the River Clyne.

The asset breached its EDM requirements on 20/9/2023 when it spilt for the sixth time during the bathing water season as per the Spill Block Counting Method.

Desktop studies and operational investigations have been undertaken, however the definitive root cause for spill frequency cannot be established at this time. This requires significant further investigation work to confirm.

2. Site Information

2.1. Site Location

The area of Sketty is a suburban district in the SA2 region, approximately 2 miles West of Swansea city centre.

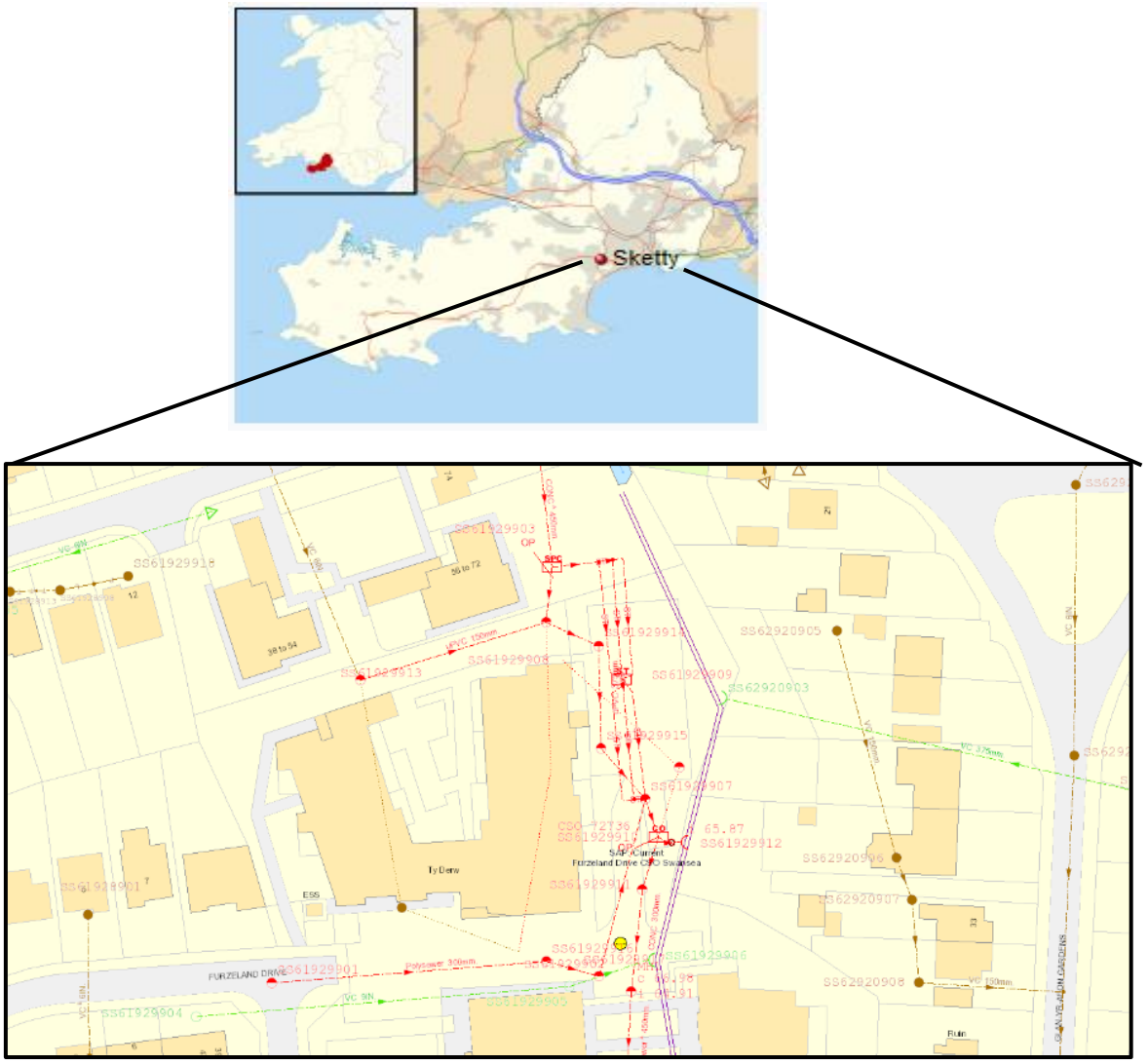

Figure 1: Location of Furzeland Drive CSO, Sketty, Swansea, Wales

2.2. Consent and EDM Requirements

Furzeland Drive CSO is permitted to discharge under BW4102301, which is a consolidated permit referred to in the variation and consolidation notice for application PAN-006897 dated 12/08/2022. The notable conditions for discharge are:

- Overflow setting 93l/s.
- Screen passing solid matter no greater than 6mm in more than 1 dimension.
- Storage of 400m^3 to be fully utilized prior to spill.
- Discharge Point NGR SS 61990 92330.

The asset breached its EDM requirements on 20/09/2023 when it spilt for the sixth time during the bathing water season as per the Spill Block Counting Method.

2.3. Asset and Telemetry Description

Furzeland Drive CSO was constructed in 2015 to replace CSO 52466, also known as Whitethorn Place. The asset receives flows from a significantly large area consisting of Carnglas and Tycoch. The catchment upstream consists of mainly residential properties covering an area of approximately 1.03km^2.

Discharge is monitored with a 'CELLO' ultrasonic sensor, used for EDM purposes. PFF is controlled by two flow control controls chambers, where flows are controlled at 45l/s and 50l/s to meet the consented overflow setting.

During normal operation, flows are restricted to 45l/s in chamber SS61929903. When flows exceed the limit, they are diverted into the new adjacent storage tanks. The contents of the storage tank are continually released back into the system at a controlled flow rate of 50l/s. Once the incoming flow exceeds the PFF, the tanks begin to fill. Once full, the spill flow rises through a static screen, passes over the weir wall, and then discharged to the culvert.

3. Desktop Study

3.1. Telemetry Data Analysis

A review of the telemetry data has been carried out for the period of recorded spills across the 2023 bathing water season. Data sets for spills are consistent with response to rainfall events in the catchment and other monitored assets in the surrounding area.

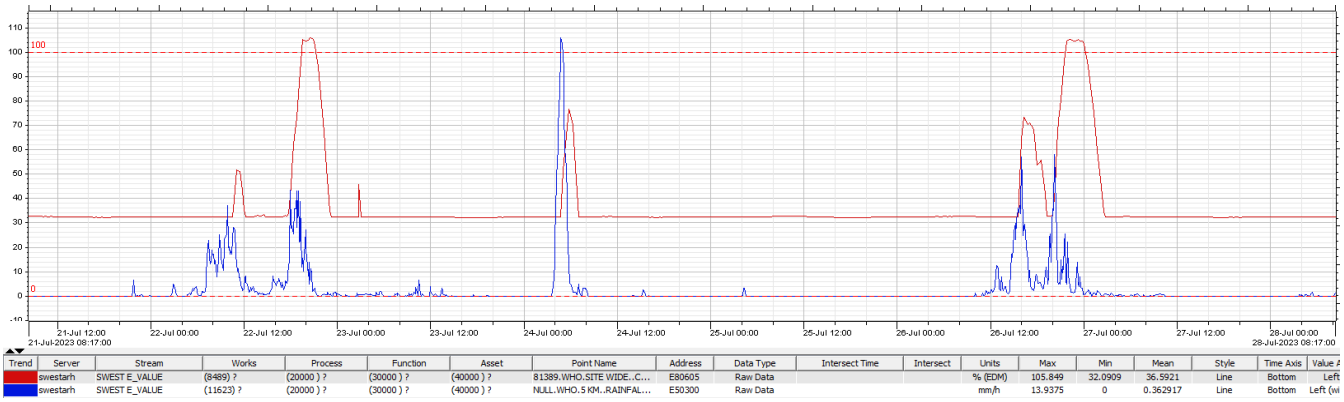

Figure 2: Red (solid line) trend displays wet well level. Red dotted line indicates spill level. Blue (solid line) trend displays rainfall. Data indicates direct link to rainfall events and suggest hydraulic overload issues.

4. Catchment Review

There is currently no Sustainable Drainage Plan scheduled for the catchment.

5. Initial Investigation Conclusions

5.1. Root cause statement

The root cause of CSO spill frequency cannot be established at this time but is likely to be attributed to hydraulic overload of the sewerage system. Significant further investigation work will be required to confirm root cause.

Of the 6 spill this summer, 4 were attributed to prolonged rainfall between 6 to 8 mm/hr. 2 of these spills lasted for only 1 hour each. There were 2 longer duration spills where rainfall was prolonged between 14 to 18 mm/ hr. Yellow weather warnings were issued for the region during 4 of spills, this included Storm Antoni and Storm Betty.

5.2. Root cause Investigations and work undertaken.

Upon notification of the asset breaching its' EDM conditions, CCTV investigations of the downstream network were undertaken to check for any obstructions that may have been impeding PFF through the CSO. No obstructions were identified.

The telemetry operation was checked, due previous spurious readings. It was concluded that spills were being recorded correctly.

5.3. Further Works Required

Further investigation works will be released by DCWW for hydraulic modelling, to understand the return periods of storms and to see if the asset spilled as expected, this will include:

- Detailed investigation of current operating mode.
- Installation of additional level monitors within the asset.
- Flow modelling of the incoming and outgoing network.

5.4. Initial Investigation Recommendations

There are several factors impacting the delivery timescales of the initial investigation:

- The new DCWW modelling framework is due to start in June 2024, once the suppliers are in place, DCWW can allocate a program of work and set timelines for model completion.
- There are currently long lead times associated with the procurement of flow monitoring equipment in the business, due to the number of monitors already allocated to other DCWW projects, including our Storm Overflow Assessment Framework (SOAF) program.

Once monitors are installed, there will be a period of data collection and validation to complete the modelling process. The projected completion date is 1st July 2025.