

Key Project Information

Delivery Type: Maintenance
SAP Code: DCWW.4597.S.218
Investment Case: 202

Primary MoS: B3 - Preventing pollution

Station Rd / Emma St / Asda Ph 2 GW4 LBE: £12.67m / £3.55m / £2.98m

Station Road, Asda Phase 2 and Emma Street

Driver and Client Scope: Llanelli is served by a fully combined wastewater sewer network. The town centre drains to Northumberland Terminal Sewage Pumping Station (TSPS) and Northumberland Combined Sewer Overflow (CSO) which discharges to the Loughor Estuary, a Designated Shellfish Water. The CSO spills need to be reduced to an annual average of no more than 10 for the National Environment Programme (NEP).

Current Position

The Northumberland catchment is a fully combined, busy urban centre hemmed in by roads and railways. It serves a population of 43,500 including Pwll, Cambrian and Burry Port all of which are pumped into Northumberland TSPS.

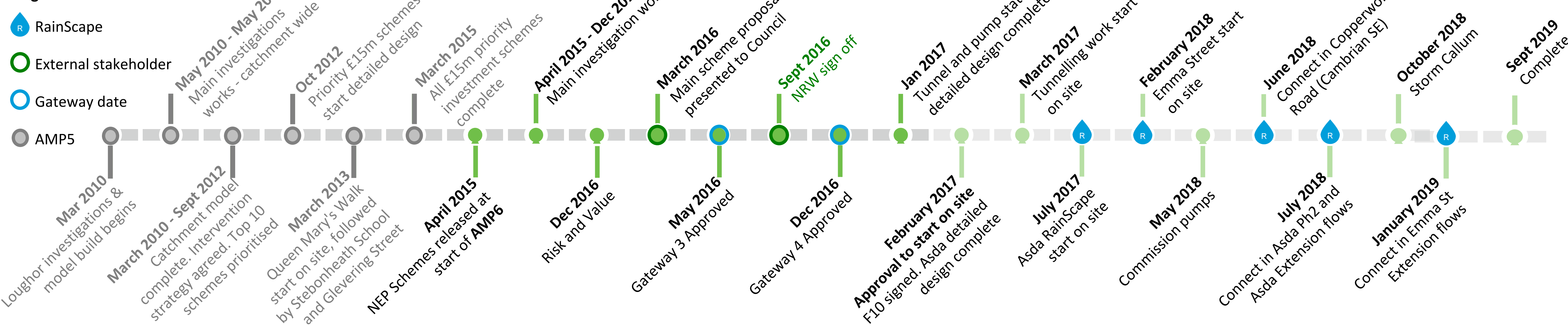
The catchment generates significant run-off during rainfall with over 100ha of impermeable area connected to the local combined sewer. During extreme rainfall, this generates 14,000l/s of runoff. Northumberland TSPS pass forward flow is 880l/s. This imbalance of flow is the root cause of the CSO spilling 76 times per year.

Solution Summary

After rigorous design, optioneering and risk and value, **the best long term catchment solution was a RainScape based strategy**. There are limited existing watercourses or surface water drainage systems in Llanelli town centre. The new Station Road Tunnel and pumping station is a purpose built surface water conduit which facilitates the RainScape strategy, aimed at helping us achieve our NEP spill driver of an annual average no more than 10.

Project Timeline

Legend



Key Facts

The new tunnel is **1500mm diameter, 1.45km long**. Installed by Tunnel Boring Machine (TBM) beneath central Llanelli. The tunnel will initially serve 18.75ha of RainScape - this equates **2,345 roof equivalents**. It is designed to accommodate up to 40ha - that is almost all the highways and front roofs in central Llanelli. This equates to 5,560l/s of runoff.

The new Stormwater Pumping station is 10.6m deep and 11.0m in diameter. The station includes three new 125kW pumps (duty / assist / assist) can deliver up to **3,300l/s**, with each pump weighing approximately 4 tonnes.

The station discharge is designed to operate under all tidal conditions, and the pumps match incoming flows up to the station duty flow rate, to maintain maximum storage volume in the upstream tunnel whilst **minimising energy usage**. A non-return overflow system **reduces the potential impact of a station power failure**.

The pumping station discharges to a new gravity outfall into the Dafen Cut; this is a new **160m long, 2.4m wide x 1.0m high concrete box culvert** with scour mattress.

Each of the nine shafts is either **4.5 or 6.0m diameter and up to 8.0m deep**.

Station Road, Asda and Emma Street RainScape reduce spills at Northumberland from 76 to less than 40 per annum. The NEP driver is achieved by additional separate works at Northumberland TSPS, currently in detailed design.

A damage assessment was undertaken on all properties and critical assets within the zone of influence, highlighting any expected ground movement greater than 3mm.

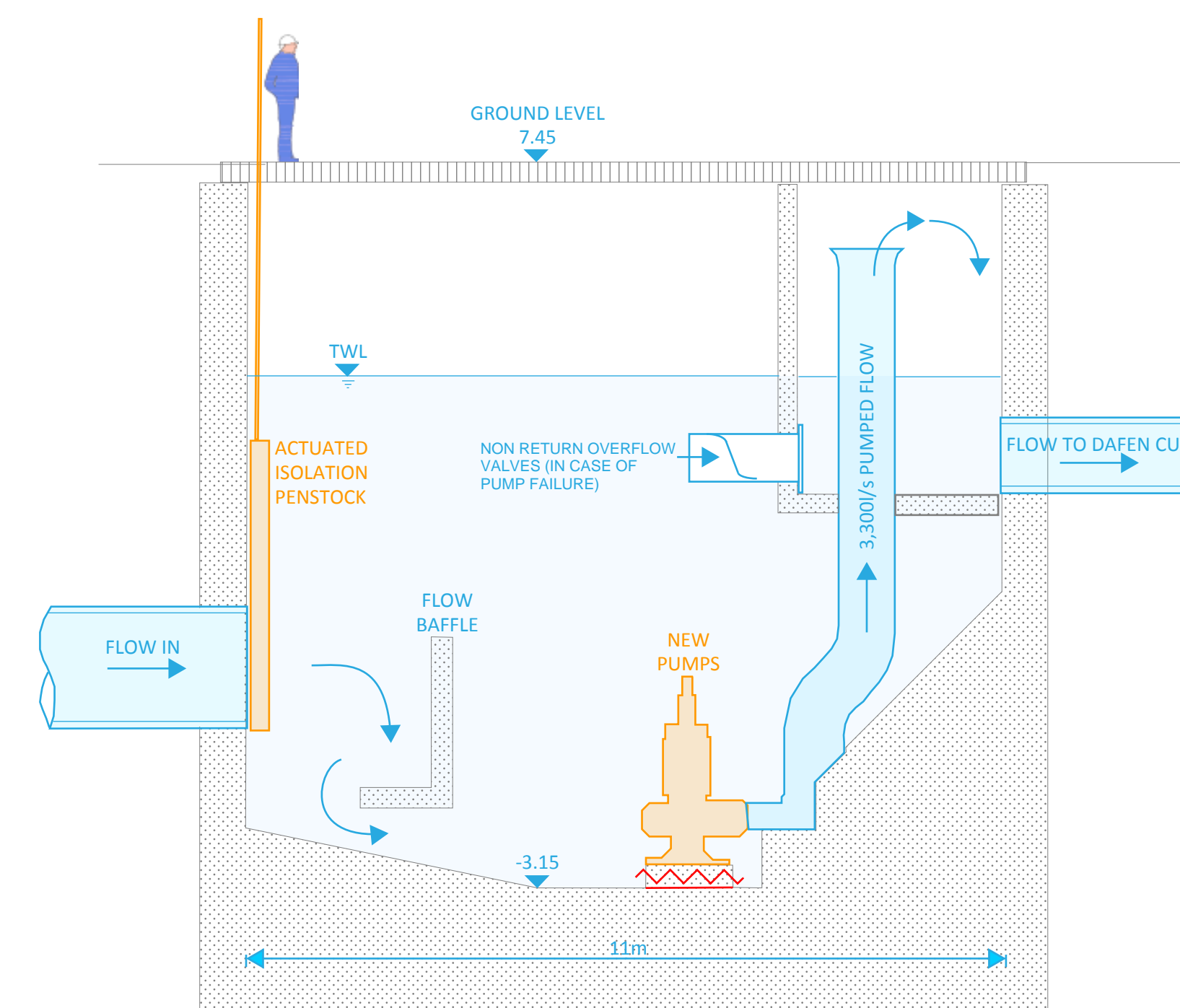
CAPEX and OPEX Summary

The combined cost of the three schemes is £19.2m. The RainScape work will remove 270,000m³ of flow from the combined sewer per annum; **saving £2,500 on annual pumping costs and 14,500kg CO₂**.

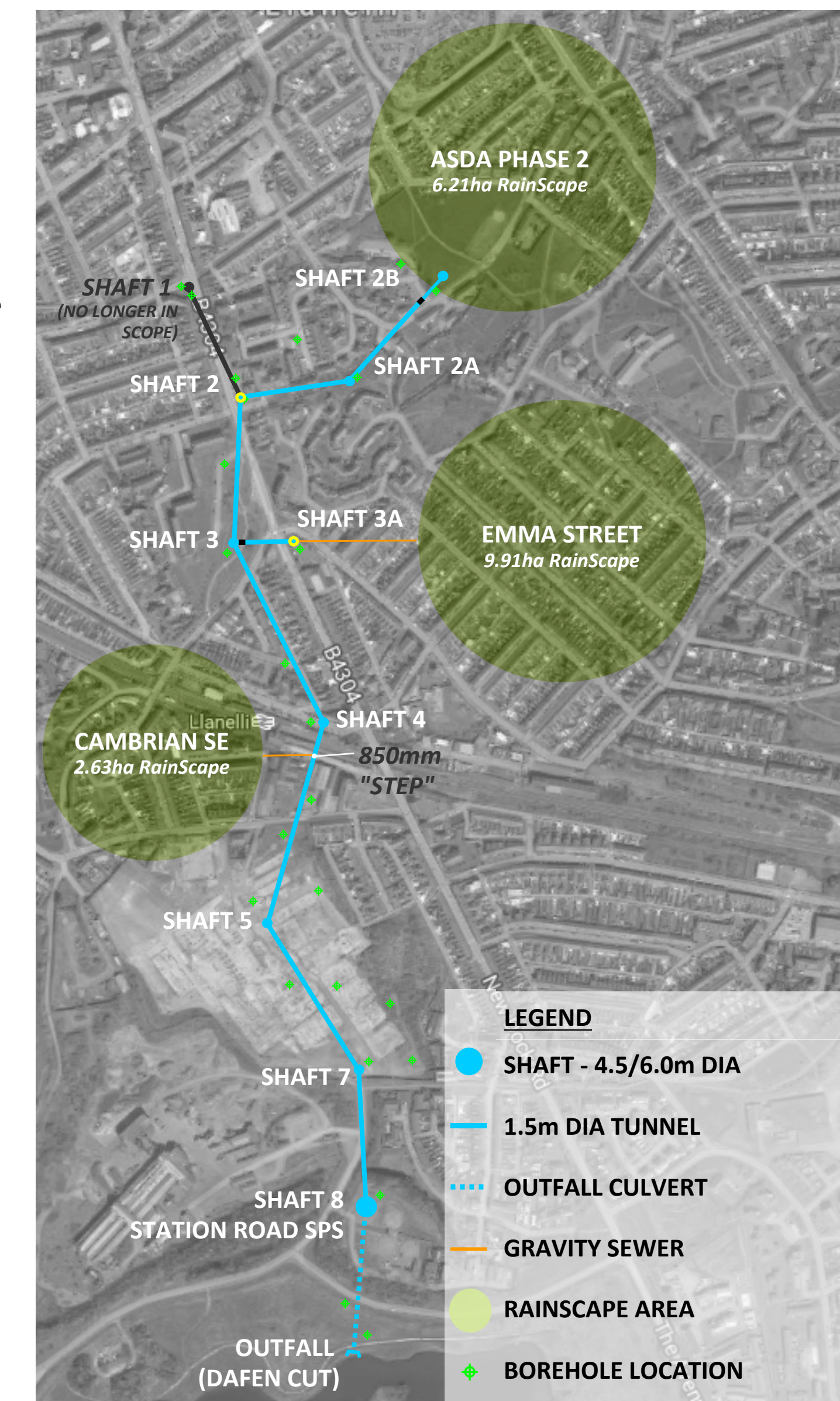
Resilience

The Station Road investment in RainScape is a step change in how Welsh Water aim to tackle key catchment issues such as flooding and water quality. The tunnel serves to facilitate growth and development in Llanelli; a direct benefit to our customers locally. **The tunnel will provide the capacity for growth and resilience for the next 100 years.**

Section through Station Road pumping station



Site Schematic



Tunnel Programme Summary

1225m of 1275m complete - 96%
Tunnel S8 - S7 - 135m - complete
Tunnel S7 - S5 - 207m - complete
Tunnel S5 - S4 - 223m - complete (invert works required to 50m)
Tunnel S4 - S3 - 230m - 220m complete
Tunnel S3 - S2 - 145m - complete
Tunnel S2 - S2a - 115m - complete
Tunnel S2a - S2b - 158m - 15m complete
Tunnel S3 - Emma st - 67m -complete