Smart sewer inspections with SewerBall®

Case Study

Severn Trent Water trialled the SUEZ SewerBall® to address sewer infiltration and illegal discharges. This autonomous device identified 24 intrusion points, validated 20 issues, and located problematic sub-catchments. Delivering inspections three times faster than traditional methods, it improved network efficiency and provided precise data for better sewer management.

Client issue

The client, Severn Trent Water, identified groundwater infiltration in the sanitary sewer network caused by aging infrastructure, resulting in cracks or compromised joints. The client wanted to detect the infiltration source and the presence of industrial waste indicating illegal discharge.

The client wanted a new method of sewer inspection that would be easy to deploy, could analyse extensive lengths of pipework, and provide precise wastewater and pipe condition assessment information.

Solution implemented

The client, a major UK water utility, chose to trial the SUEZ SewerBall® for two weeks in January 2025 in Shropshire and Staffordshire.

This is a cutting-edge, autonomous, free-floating device equipped with advanced sensors that delivers precise data to help wastewater professionals to take timely and precise action to improve operations and management of sewer pipe networks.

The SUEZ SewerBall® delivers the following results:

- Diagnoses the structural condition of sewer pipe network
- Detects and locates inflow and infiltration (I/I)
- Detects and locates industrial and non-permitted discharges
- Provides a visual inspection of wastewater pipe network
- Controls combined sewer overflows (CSO).

The solution was chosen because of its versatility and its unique ability to complete an inspection without causing major service disruptions.

Results

The client found that SewerBall® detected potential problems in its network of sewer pipes up to three times faster than traditional methods.

The SewerBall® Mini detected and pre-located 24 points of intrusion. The SewerBall® Camera was deployed over 876m, which further located and validated 20 points of intrusion. These included critical cracks and three unknown drain connections.

With the help of nine SewerBall® Extended Energy fixed stations the team identified three sub-catchments contributing to clear water inflows and one sub-catchment likely to be affected by industrial discharge.

3×

faster to detect network issues

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How it works

The SewerBall® technology employs an iterative process to identify and address I/I issues within a sewer network. This methodology leverages the combined capabilities of the SewerBall® suite, which includes various specialised components designed for different stages of the inspection process.

Initial Network Zoning and Monitoring:
The process begins by dividing the catchment area into sectors along the main pipeline. Several SewerBall® E stations are deployed to monitor key parameters such as temperature, pH, oxidation-reduction potential (ORP), and conductivity. This data helps identify the main pipeline segments that are most affected by I/I and require further inspection.

Targeted Inspection with SewerBall® M:
Once the problematic segments are identified, the SewerBall® M is used to inspect these areas in detail. This step pinpoints the specific locations of major I/I entry points, such as cracks, fractures, open or displaced joints, defective manhole covers, or other structural defects.

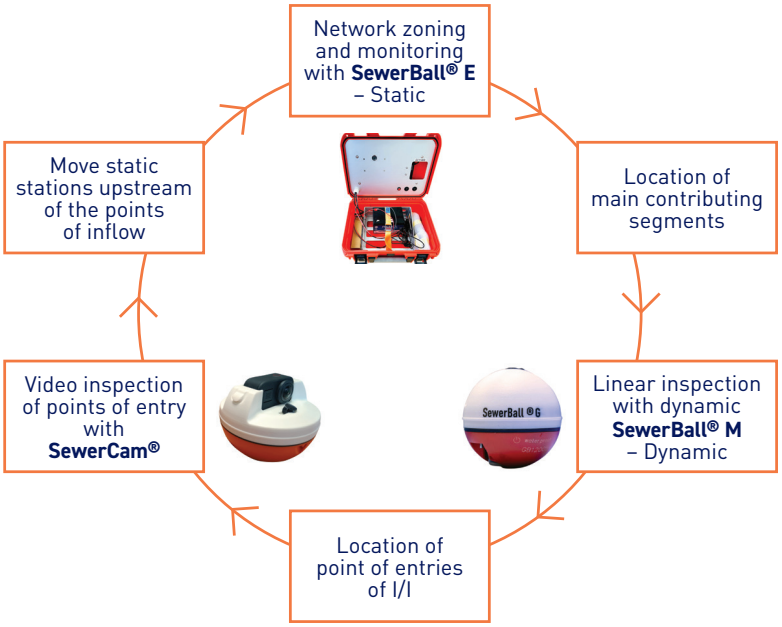
Detailed Investigation with SewerBall® Camera:
For areas with significant I/I issue, the SewerBall® Camera is deployed to conduct a more detailed investigation. This tool provides visual confirmation of defects and allows for precise identification of the problem areas.

Upstream Investigation for Connections:
If inflows are detected through a connection, further investigation is required. In such cases, the monitoring stations are moved upstream within the catchment to trace the source of the inflow. This step may also involve visual inspections of manholes to ensure a comprehensive assessment.

Iterative Process:
The inspection process is repeated iteratively, moving through the catchment area until the entire network has been surveyed and the primary sources of I/I have been located and identified.

Safety Measures:
Throughout the survey, gas monitoring is conducted as a safety measure to mitigate the risk of fire or explosion, ensuring the safety of the operation.

By combining static monitoring, dynamic inspections, and visual assessments, the SewerBall® Suite provides a systematic and efficient approach to identifying and addressing I/I issues in sewer networks.



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Differentiating factors

- The SewerBall® does not require flow diversion or prior cleaning.
- The device can operate untethered, covering distances of up to 5km in a single run, compared to a maximum of 500m with CCTV systems.
- The SewerBall® can survey between 1 and 2km of the network per day, whereas traditional CCTV inspections cover only about 250m per day.
- The SewerBall® can be used in pipes as small as 150mm in diameter with the SewerBall® Mini, and 250mm with the SewerBall® Camera.
- The SewerBall® is lightweight and easy to deploy, weighing just a few hundred grams compared to traditional robots that can weigh tens of kilograms.
- Operators do not need to enter the manhole, as the ball is launched from above ground.
- The SewerBall® has the unique ability to perform both 'static' and 'dynamic' surveys using the same device, enabling the detection of anomalies as well as precise location pinpointing.

The SewerBall® Suite

	Model	Sensors	Dimensions	Test Conditions	Use Case
	**SewerBall G – NEW** (Generic)	Conductivity, temperature, pH, Redox	Sphere Ø90mm	Diameter ≥250mm Draught ≥60mm	Dynamic I/I inspection, industrial discharges
	**SewerBall M** (Mini)	Conductivity, temperature	Sphere Ø68mm	Diameter ≥150mm Draught ≥33mm	Dynamic Inspection for I/I
	**SewerBall E Module** (Extended Energy) with **Auto-sampler**	Same as the SewerBall® attached (SewerBall® G or M)	300mm x 200mm x 150mm	Access to manhole for installation	Static inspection (network zoning) for I/I, industrial discharges
	**SewerBall Camera**	360° camera	Sphere Ø120mm	Diameter ≥250mm	Visual inspection for structural assessment

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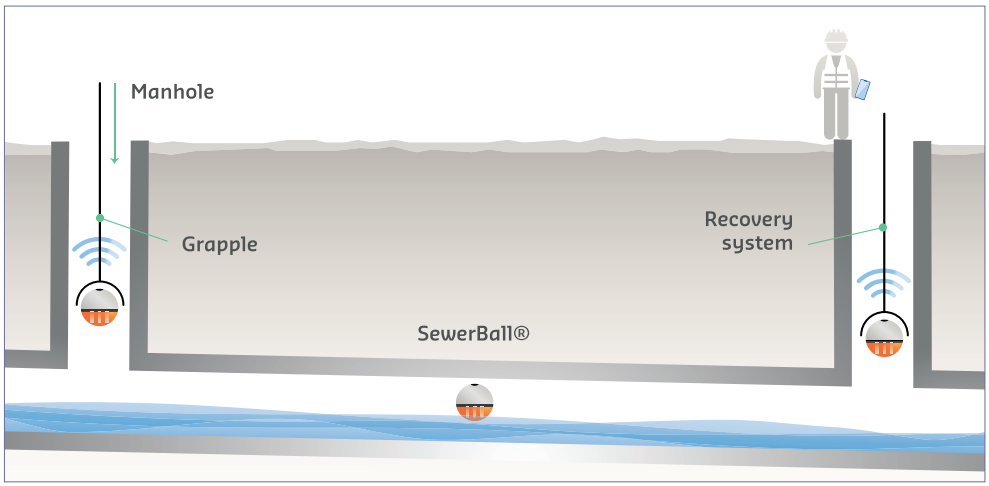

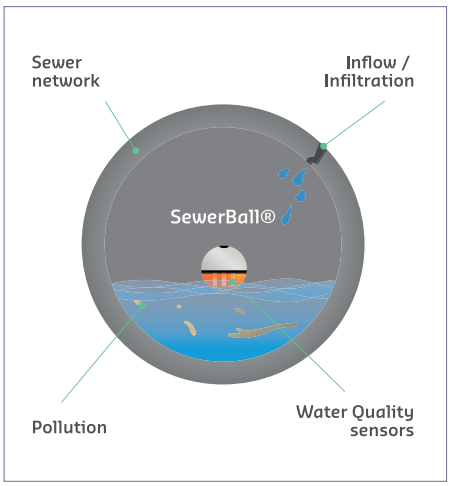

We've been trialling the SewerBall® and they've worked fantastically, helping us to pinpoint potential issues. Knowing exactly where we need to go and what the issue is will mean we can potentially dig down and make a repair much more quickly

SewerBall® means that we can access more of our network far more easily than with a standard CCTV kit. Being untethered and able to move with the flow lets us get a really good look inside the pipes and can complete an inspection much more quickly.

– Darius Bristow, Innovation Project Manager, Severn Trent Water

The future

Following the successful trial, the client has chosen to roll out the usage of the SewerBall® technology across their wastewater pipe network.

About Severn Trent Water

Severn Trent is the UK's second biggest water company. It serves 4.8m homes and business customers in England and Wales. Its region stretches from mid-Wales to Rutland and from north and mid-Wales south to the Bristol Channel and east to the Humber. The company delivers almost two billion litres of water every day through 50,000km of pipes. A further 93,000km of sewer pipes takes wastewater away to more than 1,000 sewage treatment works.

About SUEZ

Faced with growing environmental challenges, for more than 160 years, SUEZ has been acting to deliver essential services that protect and improve the quality of life. SUEZ enables its customers to provide access to water and waste services, with resilient and innovative solutions. With its 40,000 employees present in 40 countries, the Group also enables its customers to create value over the entire lifecycle of their assets and services, and to drive their ecological transition, together with their end-users. In 2023, SUEZ produced drinking water for 57 million people worldwide and sanitation services for more than 36 million people. The Group generated 7.7 TWh of energy from waste and wastewater. In 2023, SUEZ generated revenues of 8.9 billion euros.