

Saving water using satellite leak detection in SES Water



📍 UK

BACKGROUND

SES Water is a UK water supply company that serves the areas of East Surrey, West Sussex, West Kent, and South London. It supplies 160 ML per day of potable water to over 300,000 homes and businesses and a population of approximately 745,000 people. The

SES Water supply area has a total of 3,400 km of drinking water mains with 31 service reservoirs, 23 pump stations and 8 treatment works serving an area of 835 km². SES obtains 85% of its supply from groundwater and 15% from the Bough Beech Reservoir. SES has set out

a goal of reducing water leakage by 24% by 2030 in its 2022 Water Resources Management Plan. As part of that plan ASTERRA was hired to provide satellite leakage detection services.



A type of satellite imagery is taken using Synthetic Aperture Radar (SAR) microwave wavelengths over the area of interest and measuring backscatter pulse data for analysis. The satellite image and subsequent analysis is overlaid with the pipe network GIS and the sections of pipe where water leaks were detected are highlighted. Likely leak locations (LLL) are identified and supplied to the utility company for field technicians to investigate.

ASTERRA identified 211 likely leak locations from just over 1000km of pipe. These POIs were verified in the field by a small team of qualified leakage technicians using a combination of the

latest acoustic technologies. In summary, a total of 219 leaks were found across 59 days of field inspection work by the boots-on-the-ground crew.

The teams on the ground found **3.7 leaks for each crew day and 2.2 leaks for each kilometre physically inspected**. Looking at a comparable time frame, without satellite likely leak locations SES estimate between 1.5 and 2.0 leaks per crew day typically found as BAU, hence in this case the technology helped provide a **1.9 to 2.5 fold efficiency improvement** for the number of leaks found per day. A breakdown of the leak subtypes is shown in the table below.

SES RESULTS BY LEAK TYPE

Mains	Distribution	Customer-Side	Work Order	Other
21	121	29	44	4



The value added through ASTERRA'S service is demonstrated through the total volume of leaking water recovered from satellite POIs. By combining the break down of different leak subtype throughout the investigations and standard estimated flow rates set by SES, **a volumetric saving of 0.9 megalitres per day was reported by SES analysts helping achieve their 15% leakage reduction target** this AMP period. The value of the ASTERRA approach is underscored by its ability to find a range of leak sizes across vast areas at once. From this project **94% of the leaks found were non-surfacing**. These are leaks that might not have been found without the assistance satellite leak detection, which in the long run helps to reduce costs and leakage break out by identifying leaks before they grow in volume and cost to repair."



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