SENSING EXCELLENCE

Multisensor

CASE STUDY

Monitoring of Spring Water for Kerosene Contamination

Application Dossier: No. XV

Application

Monitoring of Spring Water for Kerosene Contamination

Product

MS1200-01-SYS – Standard version, 4-20 mA

MS1200
Oil in Water Monitor

Application

Monitoring of water coming from a spring feeding a local water company.

Customer

Water Company, Slovenia.

Problem

A train accident where 10,000 litres of kerosene was spilled near the spring threatened the water source. After the spill, the water company was forced to conduct 8 laboratory tests per day, at huge cost, to ensure contamination has not affected the supply.

Product

MS1200-01-SYS – Standard version, 4-20 mA.

Installation Facts

In June 2019, a train transporting kerosene derailed and 10,000 litres were spilled into the surrounding area. The geography of the area meant that it was quite difficult to ascertain when and if the contamination was going to reach the water source (a spring which feeds a river) a short distance away. The local water treatment plant (WTP) relies on this water source and the only alternative is to import water from a nearby country at a cost of 1,500 Euro/hour.

This meant that the water company had to strike a balance between keeping the water safe for consumption and, at the same time, keep the costs under control.

For the first few months the WTP had to do a large amount of testing to ensure the continued quality of the water. These tests,

A picture of the unit installed in the outbuilding.

carried out every 3 hours, came at a high cost (2400 Euro per day).

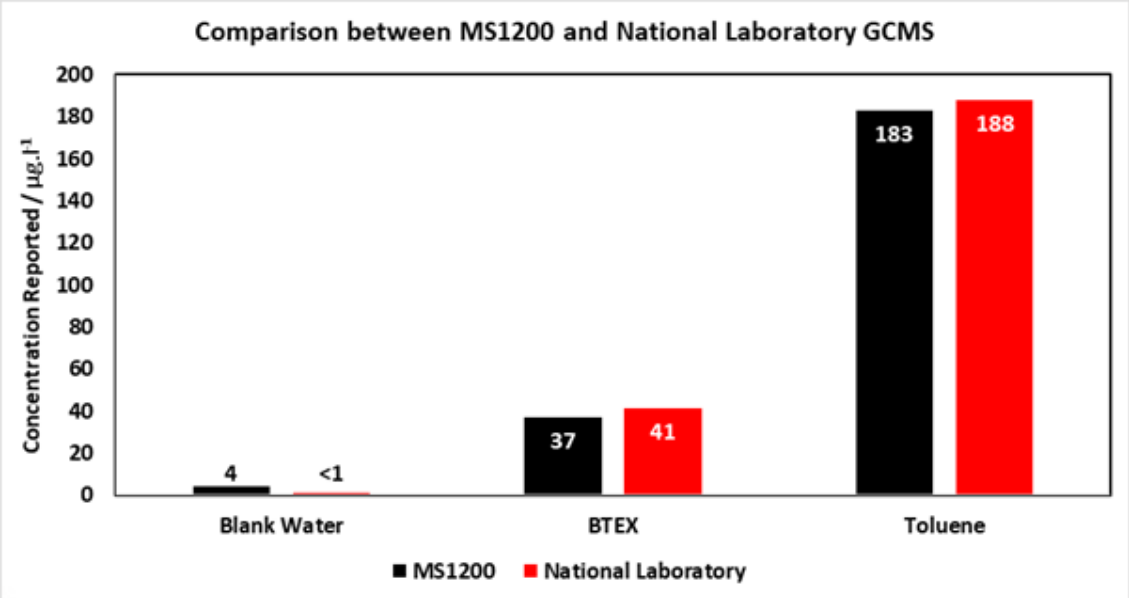
Multisensor was contacted to address the problem and after some consultations the MS1200 Oil in Water Monitor was installed at one of the two critical points.

In March 2020, the system was also tested by the National Laboratory of Health, Environment and Food Slovenia via a comparison between a GC-MS and the MS1200 online measurements.

Since these tests were completed, the WTP management can confidently rely on the analyser to give a measurement every 20 minutes. This also means their testing at the laboratory has massively decreased, leading to huge savings.

Technical Information

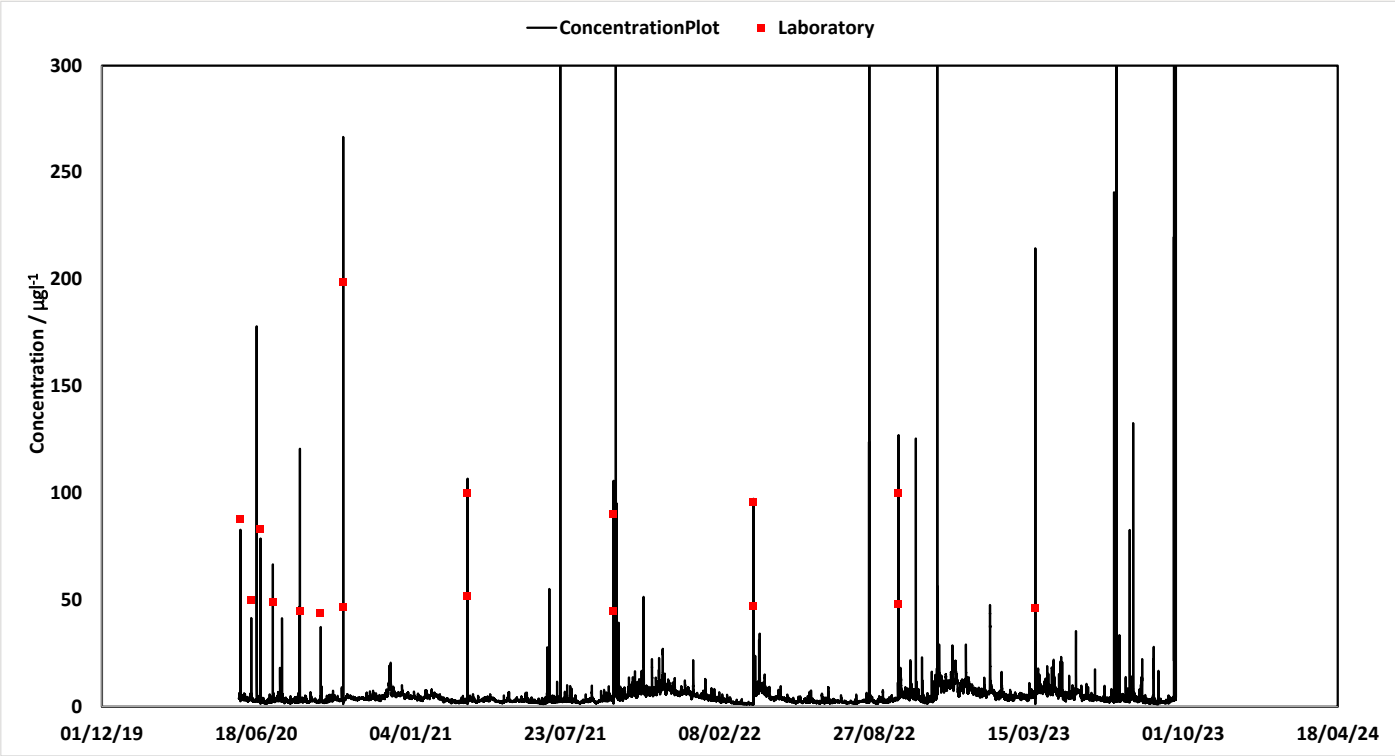
Measurements were conducted with a 20-minute sampling interval at an airflow rate of approximately 84 $ml.min^{-1}$. Measurements were conducted on a GCMS instrument (GC - Agilent 6890N, MS - Agilent 5975). Separation was performed on a capillary column (Agilent J&W DB - 624 UI capillary column; 121-1324; 20m x 180 um x 1um). The SIM technique was used for the GCMS detection.



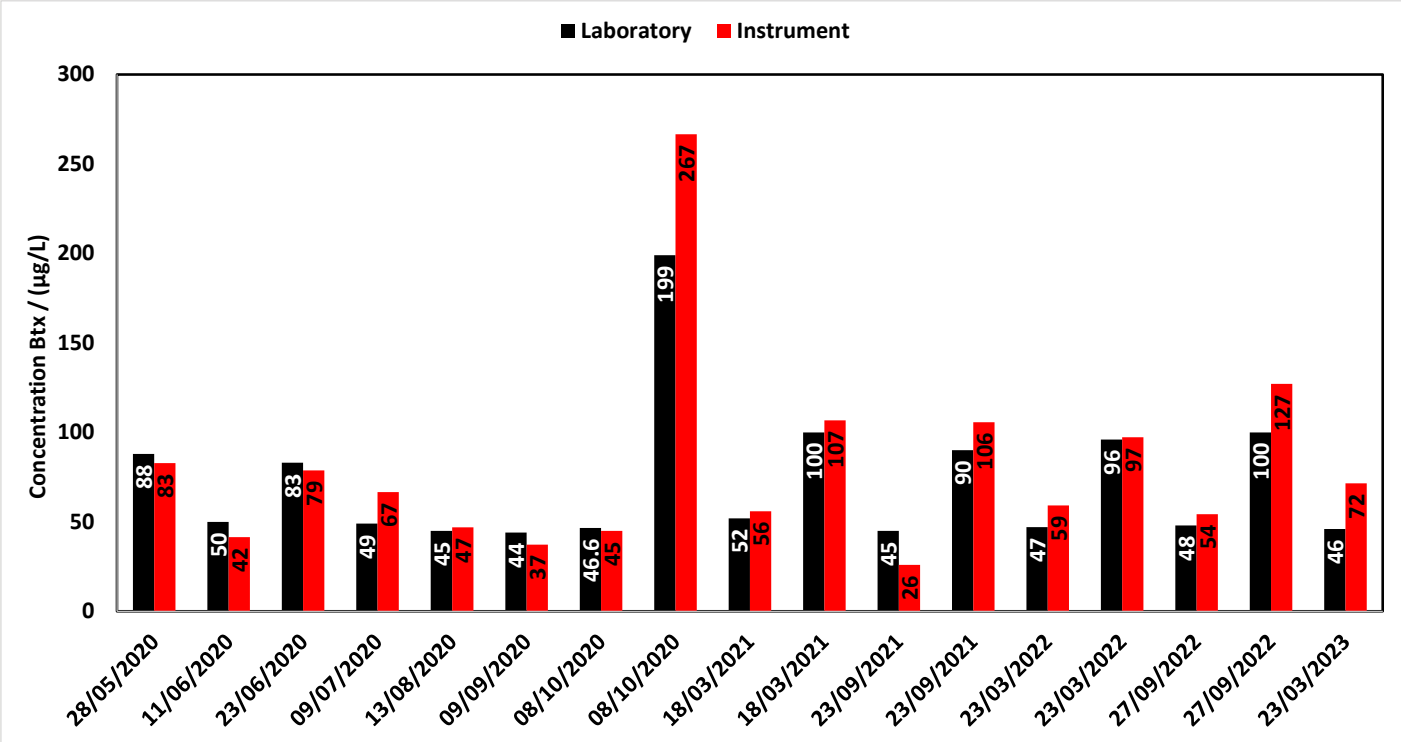
Comparison between MS1200 and laboratory for BTEX and Toluene

The instrument was calibrated and validated for toluene using Multisensor's standard method.

This instrument has been one of the most closely analysed instrument on any site since people in the local area expect tap water to be fully potable and drink it with full confidence in its quality.



More than 3 years of data from the MS1200 installed at the intake and comparisons with laboratory.



Comparisons between Laboratory and Online Instrument over a 3+ year period.

Between 2020 and 2023 a lot of data was collected over a period of 3 years, validation checks where performed at regular intervals, always comparing results from the laboratory with standard methods and results coming from the analyser.
These results over such a long timeframe provide a good insight into the level of accuracy, repeatibility and long-term stability to expect from the MS1200 analyser.

Following these results a second VOC analyser was purchased by the same water company to be installed after an activated carbon filter bed to provide extra safety for their operations.

Why Multisensor?

The Water Treatment Plant needed a way to de-tect hydrocarbons at very low levels with alarms at 10-20 ppb.

Following extensive testing the instrument is now used instead of expensive laboratory anal-ysis carried out that were carried out every 3 hours.

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Did you know?

Train accidents involving hazardous material spills, including diesel and fuels, have always been a significant concern. Between 2019 and 2022, there were 6,886 rail accidents in the U.S., which included derailments, collisions, fires, and hazardous material releases.

A well-documented incident in 2020 was the derailment in Llangennech, Wales, which resulted in the spillage of diesel into the Loughor Estuary. This incident required extensive environmental response efforts, including digging trenches to intercept diesel and using absorbent pads to contain the spill. Monitoring and clean-up operations continued for weeks, with over half of the diesel eventually evaporating or biodegrading.

For more information

Visit: www.multisensor.co.uk
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Front Image Credit: Erik Cooper, Slovenia

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Multisensor Systems is a developer and supplier of Water and Gas Analysers specialising in oil in water and hydrocarbon analysers, oil in water detectors, VOC monitors and THM analysers based in the United Kingdom.

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CHANGELOG

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