



# Enigma 3hyQ

## Trial with Veolia, Lyon

### Introduction

Primayer introduced its advanced version Enigma, multipoint correlator, with integrated 3G / GPRS communications and hydrophone sensor. Veolia needs survey systems for trunk mains and plastic pipes. Conventional accelerometer sensors have acoustic limit on these situations where the pipe is more elastic. The hydrophone sensor will give better results as it contacts directly with water. Trials were carried out at two sites.

### Trial site 1

On 28<sup>th</sup> June three devices were deployed on a steel pipe of 1250 mm diameter. Hydrophone sensor was fitted on valve and connected to Enigma3hyQ correlation noise logger.

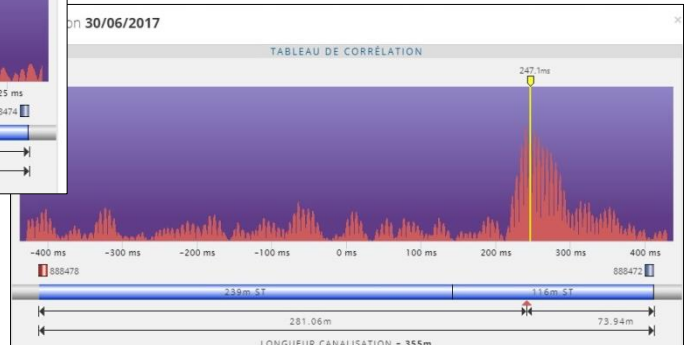
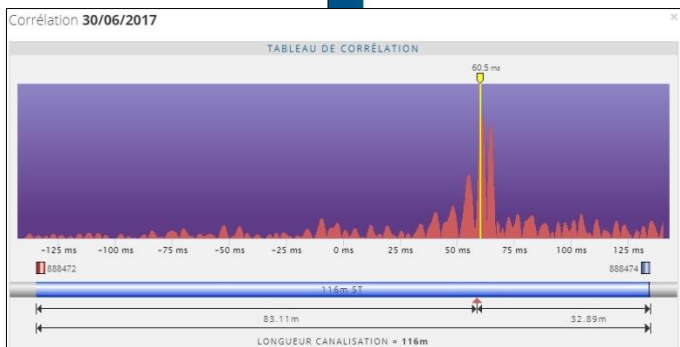
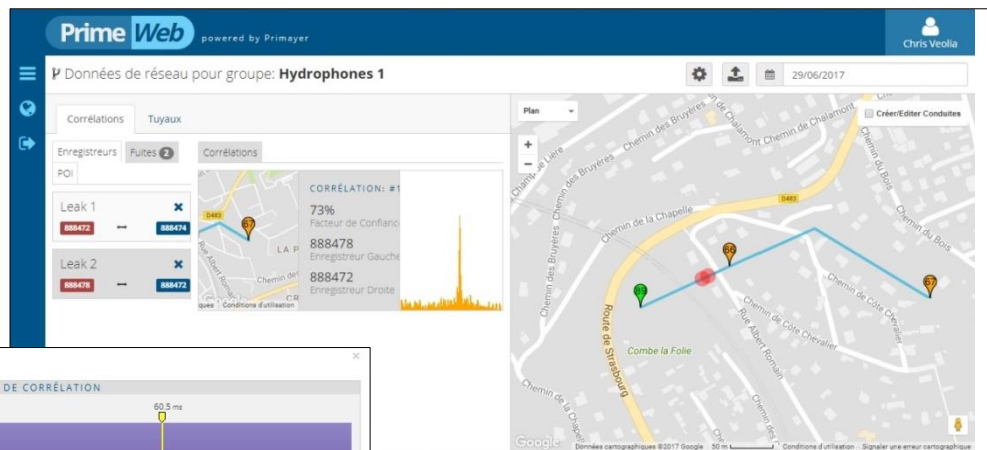
The Enigma3hyQ loggers were installed on the network with a distance of 116 to 355 metres between loggers. The programming module can directly program loggers on site and displays the serial number, battery level and device diagnostics. Once programmed, the Enigma3hyQ sends a confirmation message. The following day the loggers transfer the GPS location information and sound files on the



PrimeWeb interface accessible from any tool connected to the Internet.

The operator can form a network diagram and also change the linear pipeline from GIS if the distances from default Google Map prove incorrect.

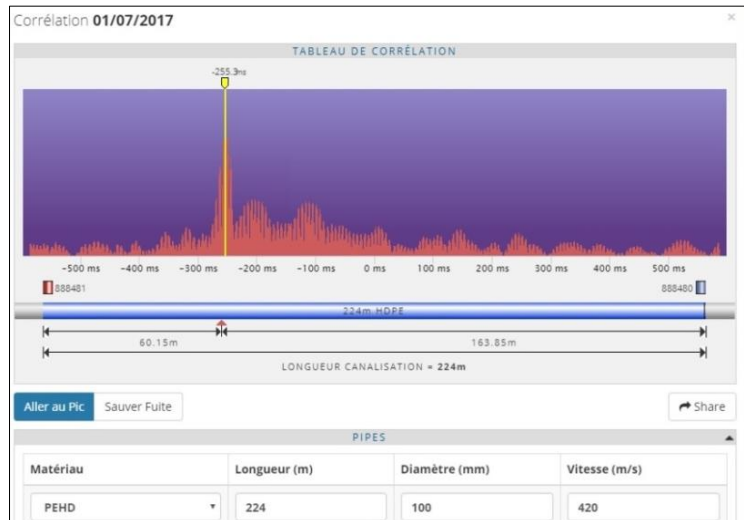
A confidence factor is displayed and guides the user on the probability of the noise correlation success. Here the confidence factor was high at 73%. The leak was confirmed over both 116 metre and 355 metre distances between loggers.





### Trial site 2

Two loggers were installed on 110mm diameter HDPE diameter with a distance of 224m between sensors. A correlation peak was not seen after the first day sample of leak noise. One feature of the Enigma3 technology, named 'multiday,' is that it will aggregate the sound files to form a very much longer sound file for correlation analysis. After the second night the correlation peak was clearly identified with the leak correctly shown at 60 metres. Google Street-View shows the approximate leak position to aid planning for the repair activity.



Corrélations: #1  
Facteur de Confiance: 62%  
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