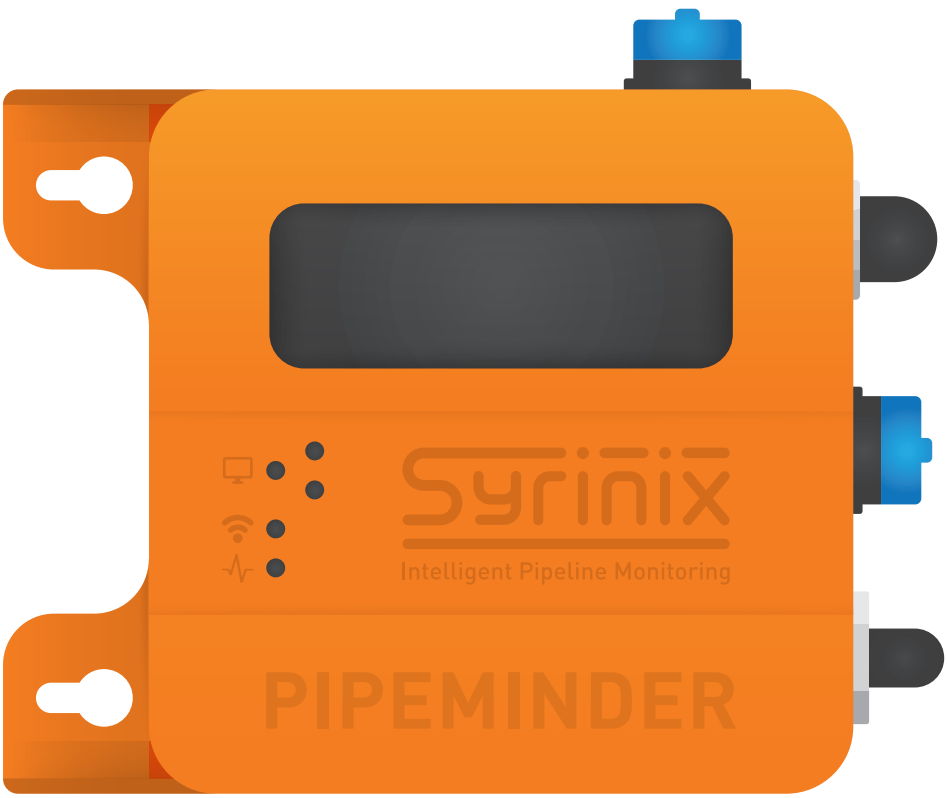
LAS VEGAS VALLEY WATER DISTRICT CASE STUDY



PIPEMINDER S

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LAS VEGAS VALLEY WATER DISTRICT'S USE OF PIPEMINDER-S RESULTED IN A 50% REDUCTION IN THE MAGNITUDE OF TRANSIENTS

PROJECT SUMMARY

Las Vegas Valley Water District (**LVVWD**) had experienced 3 line breaks in close proximity and installed **PIPEMINDER-S** devices to understand why.

Our high resolution monitoring provided them with data revealing that they were experiencing harmful transients with ranges exceeding **300 psi**, twice that of the pipelines maximum pressure rating.

These large pressure spikes were occuring in less than 0.05 seconds, meaning the high resolution sampling of 128 samples per second provided by **PIPEMINDER-S** was essential in detecting these events.

Using the information provided, **LVVWD** were able to make the necessary changes to calm down the network. This resulted in the size of these pressure transients being **reduced by over 50%**, and the operating pressures of the pipeline remaining much closer to its maximum rating.

ABOUT LAS VEGAS VALLEY WATER DISTRICT

As a desert state with a dense population and large water demand, municipal water systems need to be able to function at a high level under high demand.

Few regions in the world are more efficient at managing their water resources than Nevada. Organisations such as WaterStart, the Governor's office of Economic Development (GOED), the Las Vegas Global Economic Alliance (LVGEA), and the Southern Nevada Water Authority (SNWA) have been collaborating together to bring new world-wide technologies to the area to look at conservation and preservation.

Las Vegas Valley Water District (**LVVWD**) is formed of over 375,000 active services. There are 23 active pressure zones and more than 4,500 miles of pipe ranging from 4-inch through to 102-inch in size; with more than 1,600 miles of service laterals. The area houses 79 reservoir basins and tanks that collectively hold nearly 1 billion gallons of water, with 53 pumping stations with the capacity to move more than 1 million gallons of water per minute, with more than 6500 miles of water transmission and distribution pipelines. Non-revenue water equates to 4.8% most of which is unknown loss.

PIPEMINDER DEPLOYMENT

Three main breaks had occurred on a section of the Sun City Boulevard at Highland Falls Drive and there was a keenness to understand why these had happened in such close proximity.

In March 2016 LVVWD installed Syrinix **PIPEMINDER-S** units to ascertain whether potentially damaging transients were occurring on sections of its network.

Could **PIPEMINDER-S** technology offer previously unseen information?

LVVWD has by its own admission, one of the most sophisticated SCADA systems in the world, yet no transient events or unusual activity had been previously detected in the area.

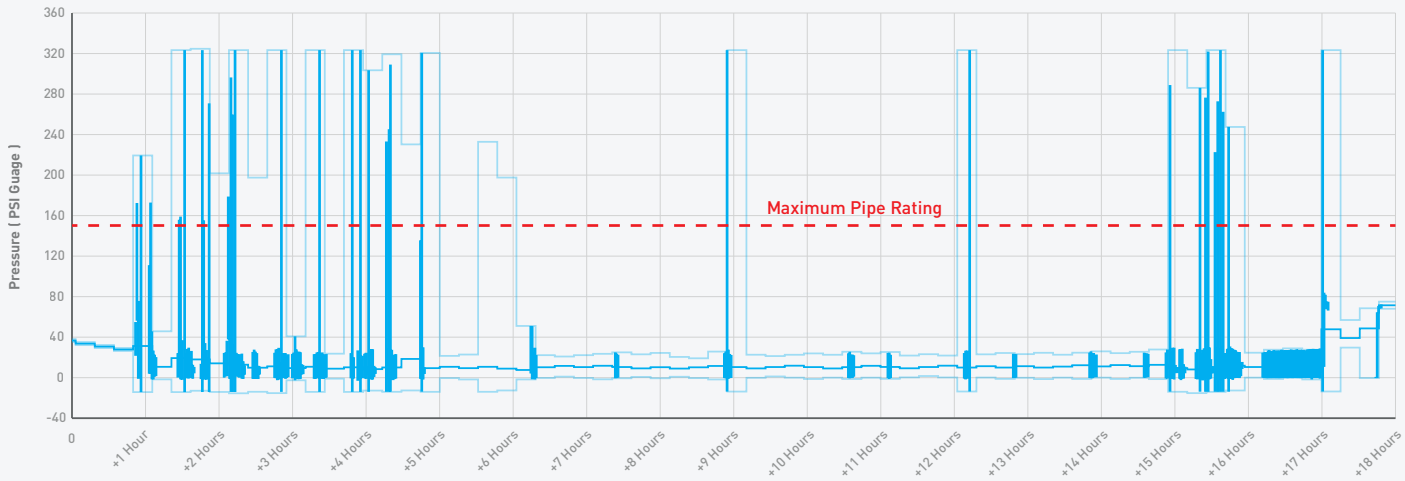
PIPEMINDER-S devices were deployed at several locations and each device was configured to monitor continuously at 128 S/s and to summarise the minimum, mean and maximum pressure for each 15 minutes of the day.

The units were installed on small 1/4" service connections, automatically plotting their GPS locations via **RADAR's** (the Syrinix online portal) map interface, and they began sending the pressure information remotely over the cellular connection.

After just a week of monitoring there were clearly visible patterns of extreme pressure peaks, in some case exceeding over **300 psi**, which occurred in less than one one-hundredth of a second.

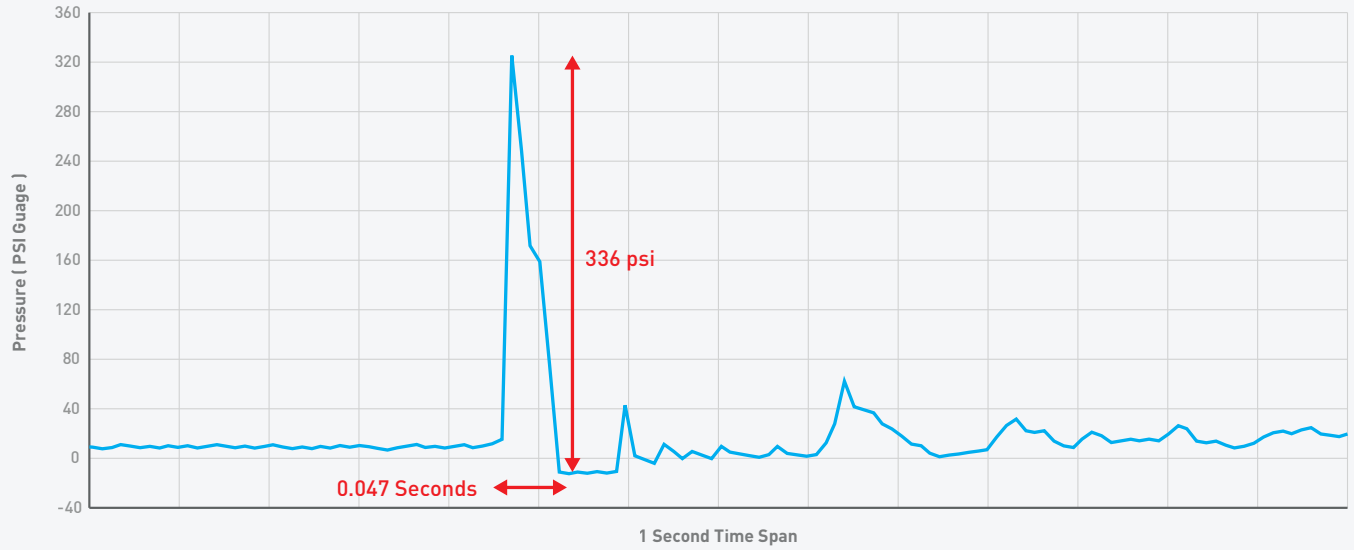
Data recorded revealed that pressure events over 323 psi were occurring.

The graph below indicates an operational pressure of 10 psi, with approximately fifteen unexpected pressure transients exceeding 320 psi over a 17-hour period.



Looking at a single transient from the period, it can be seen that the pressure spiked from 13 psi up to 323 psi and then immediately dropped to a full vaccum.

This range was spanned in just 0.047 seconds, which would be entirely undetectable by any pressure logger with a low-sample rate.



CALMING THE NETWORK

The three breaks that had occurred on this line were due to these cyclic loads on the PVC pipeline which is only rated for a maximum allowable pressure of 150 psi.

When the recorded transient data was overlaid with the utility SCADA system data, it was instantly visible that the transient activity correlated with valve operation activity within the network.

The visibility of this information gave LVVWD what they needed to enable the necessary changes to be made to valve operations in order to calm down the network, mitigate the risk of further breaks and prolong the life of the main.

The utility's immediate changes and investigations included:

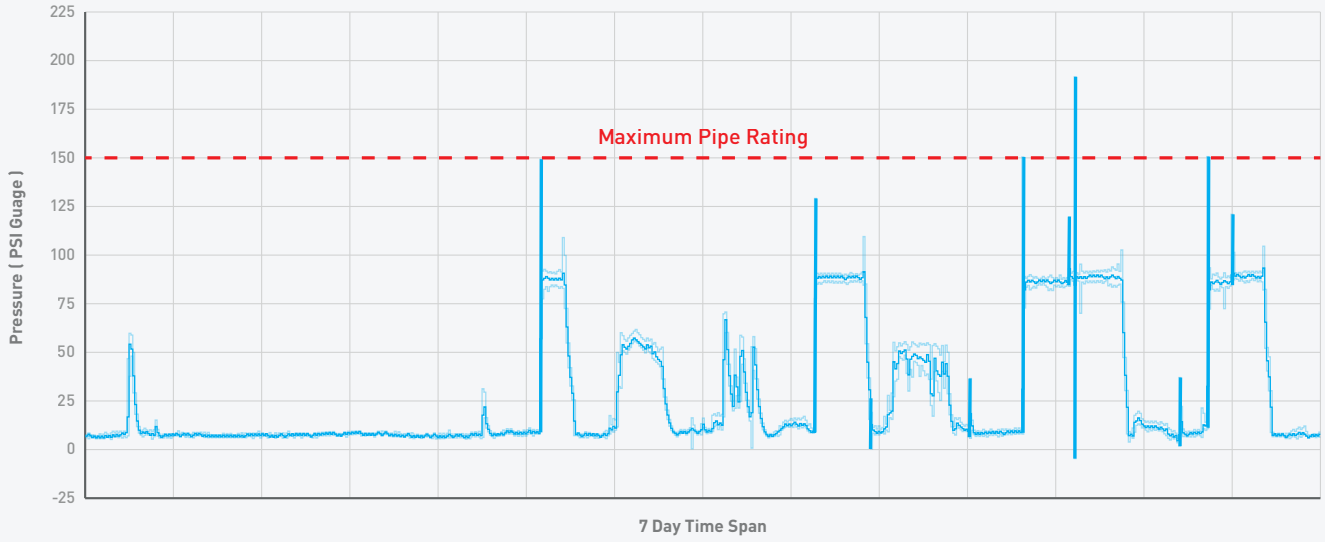
A) Slowing down the valve speed which would reduce the severity of the transients.

B) Investigating why SCADA had recordings of the valve frequently opening at 5-15% capacity.

C) Installing **PIPEMINDER-S** at other golf course feed valves to determine if the incidence and magnitude of the valve induced pressure spikes could be reduced to 150psi.

Once this work was implemented at Highland Falls, the maximum observed pressure reduced from 323 psi to 160 psi.

The graph below showing data afer the remedial work, gave **LVVWD** peace of mind that the harsh transients had now been greatly reduced, and that the remedial work had successfully calmed the network.



KEVIN FISHER

DIRECTOR OF WATER QUALITY AND TREATMENT FOR LVVWD

Syrinix technology gave us the information we required to understand why these line breaks were happening, which enabled us to act and make changes on the line to ensure it didn't keep happening.

The value of high resolution monitoring, gave us greater visibility, which in turn meant we could plan the specific operation repairs with the conviction we were at the direct root of the problem. The cost of one saved burst, equated to the cost of the installation and the hardware purchased, therefore we're happy that the Syrinix units not only solved our problem but **saved us money and time** too.

Find out how **PIPEMINDER-S** can transform the way you manage your supply pipelines today

Visit **syrinix.com** for more details or call us at **+1 905 973 6117**

BATTERY POWERED

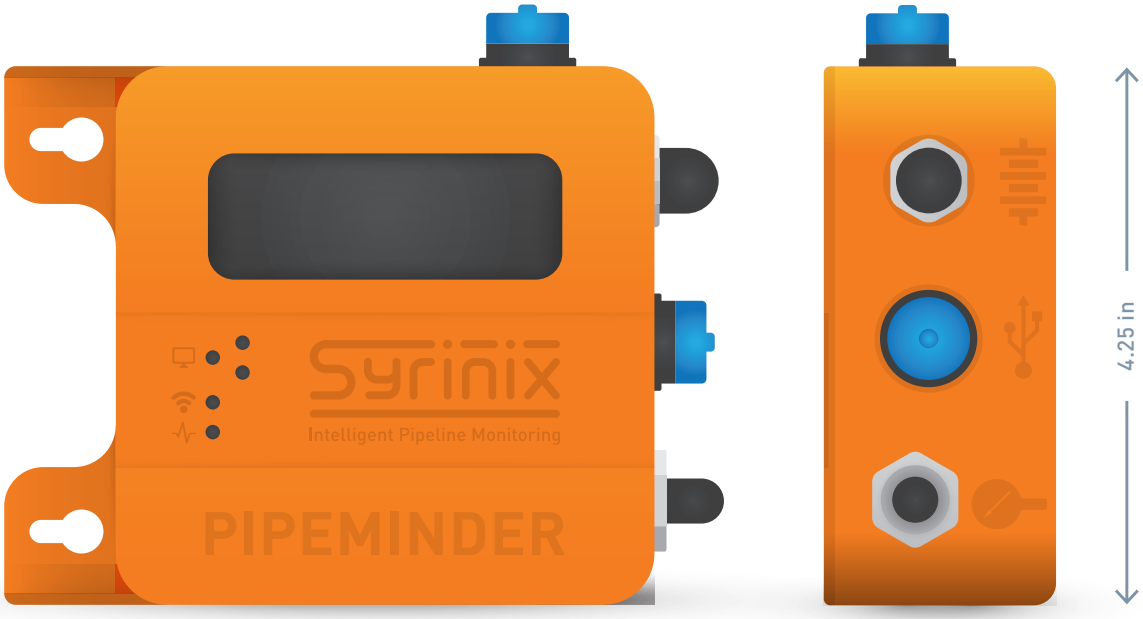
300 Psi PRESSURE TRANSDUCER

3G SIM CARD

IP68 RATED

128 SAMPLES/SECOND

GPS TIME & LOCATION TRACKING



Weight: 2 lb 1 oz

Syrinix
Intelligent Pipeline Monitoring