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ASTERRA Satellite Leak Detection Service

ServicioS De Aguay Drenaje De Monterrey, I.P.D

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Monterrey is the capital and largest city in the northeastern state of Nuevo Leon, Mexico. It is the second largest city in Mexico with a population over 1.1 million residents. ASTERRA performed a continuous leak detection program in the water supply network to assist the Monterrey Water and Drainage Services (SADM) in non-revenue water reduction.

A satellite image is taken using synthetic aperture radar (SAR) by means of microwave illumination of the area of interest and collection of backscatter pulses for analysis. Once the satellite image is obtained, it is overlaid with the water pipe network GIS and the pipes where water leaks were detected are highlighted.

The Monterrey area of interest has a total of 2,493.5 km of drinking water pipelines made up of 629 circuits and 31 microcircuits. 190 points of interest, or, likely leak locations, were detected. The points of interest represent 6% of the network analyzed. These points of interest were verified in the field using acoustic leak detection equipment. The final results are as follows. A total of 113 leaks were found in 39 days of field inspection work by boots-on-the-ground crews covering 146.4 Km. This represents a performance metric of 2.9 leaks found per crew day and 0.78 leaks found per kilometer physically inspected. 111 leaks were found on the utility side of the meter and thus are non-revenue water leaks and two were found on the customer side of the meter. A breakdown of the utility side leak subtypes is shown below.

MONTERREY LEAKS BY SUB TYPE			
Pipe Main	Service Pipe	Valve	Meter
5	98	2	6

In order to calculate the value proposition of the program the total volume of leaking water recovered must be calculated. The discharge coefficient was calculated based on system input pressure tests performed by SADM. The pressure analysis was correlated to leak behavior to determine real water loss in each sector.

According to the data provided by SADM, the volume recovered by the leaks found and repaired through the Satellite Detection Project is on average

4,746.39 m3 / day.

Considering an average price of $0.80 per m3

this is equivalent to $ 3,776.75 per day in savings.

Based on the final results, SADM calculated that the performance of the crews increased by 59% related to the number of leaks found per day and a net increase of 28% in the total number of leaks found per kilometer. Additionally, SADM determined using the ASTERRA dashboard and applications provided important tools for management to understand the value of the program. The ASTERRA solution enables the optimization of planning leak detection activities based on geographic areas and time constraints. The pilot program performed for Monterrey was deemed a success by SADM as it improved the ability of staff to find leaks using fewer resources and in a shorter amount of time than the traditional methods employed historically.