YUPAM ICUWT Kongresi (Yer Altı Yer Üstü Ulaşım Planlama ve Araştırma Merkezi Kurulması)

International Congress on Underground Infrastructure, Water Management and Trenchless Technology

7-8 September 2017

İstanbul Medeniyet University

YUPAM (Yer Altı Yer Üstü Ulaşım Planlama Araştırma Merkezi Kurulması Projesi) İSTKA 2016 Yenilikçi ve Yaratıcı Mali Destek Programı tarafından hibelenmiştir. YUPAM Projesi İSTKA 2016 Yenilikçi ve Yaratıcı Mali Destek Programı tarafından hibelenmiştir. ICUWT- Yer Altı Alt Yapı, Su Yönetimi ve Kazısız Teknolojiler Uluslararası Kongresi (International Congress on Underground Infrastructure Water Management and Trenchless Technology) YUPAM projesi kapsamında İstanbul Medeniyet Üniversitesi'nde 7-8 Eylül 2017'de düzenlenmiştir.

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WATER LEAK DETECTION INSTRUMENTS AND EARLY WARNING SYSTEMS

WELCOME TO THE PRESENTATION

Noise Correlating Loggers and Working Principle

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Zonescan820 ALPHA

Set of smart water leak detection instrument

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Noise Correlating Logger

It can be placed at valves, chambers, hydrants and house connections.

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Signal Repeater

It should be located on the adequate height such as telephone and electricity poles

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Patroller and 3G Modem, Alpha

It must be located on a place which has a bird eye sight on the repeaters.

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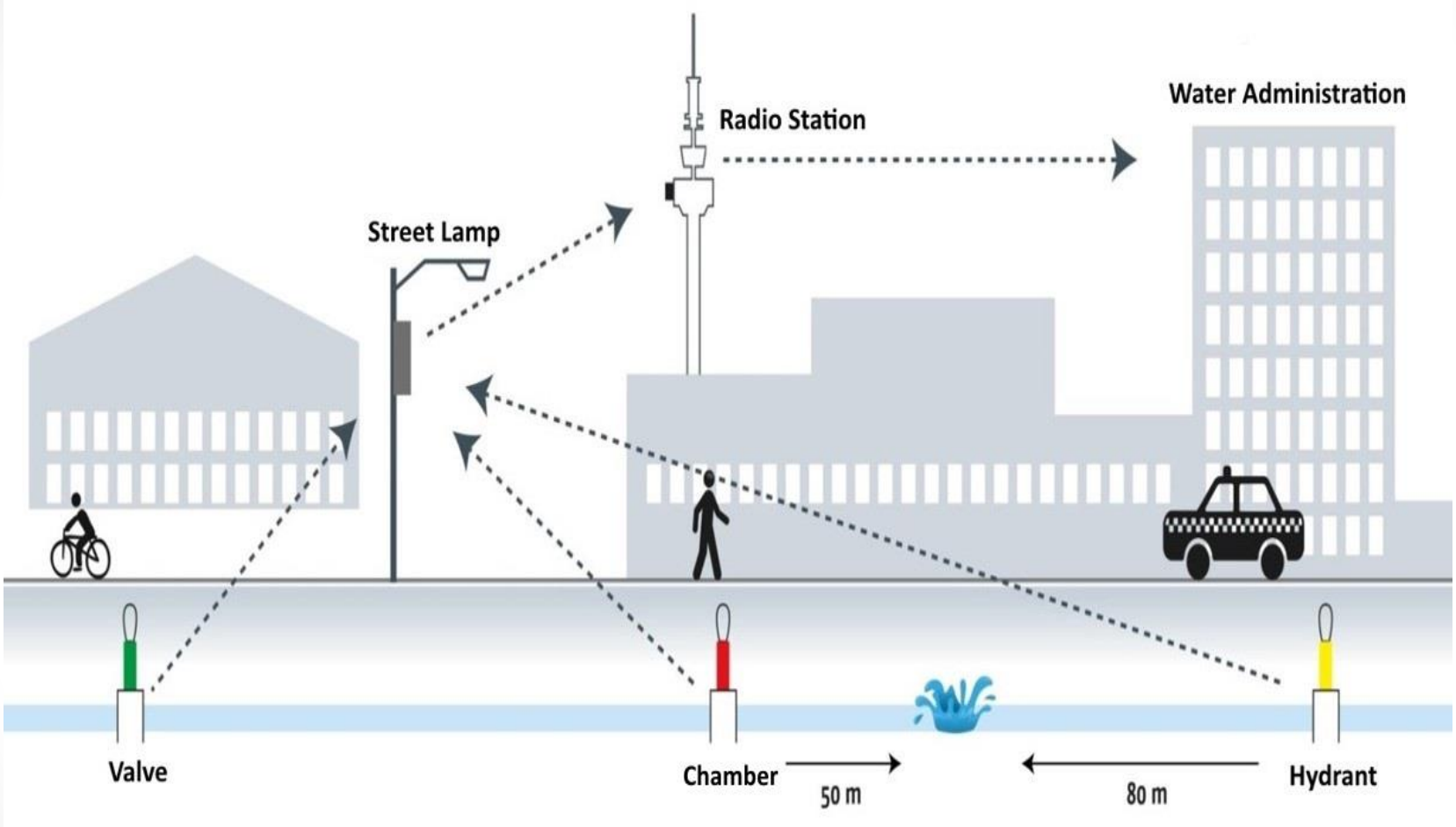
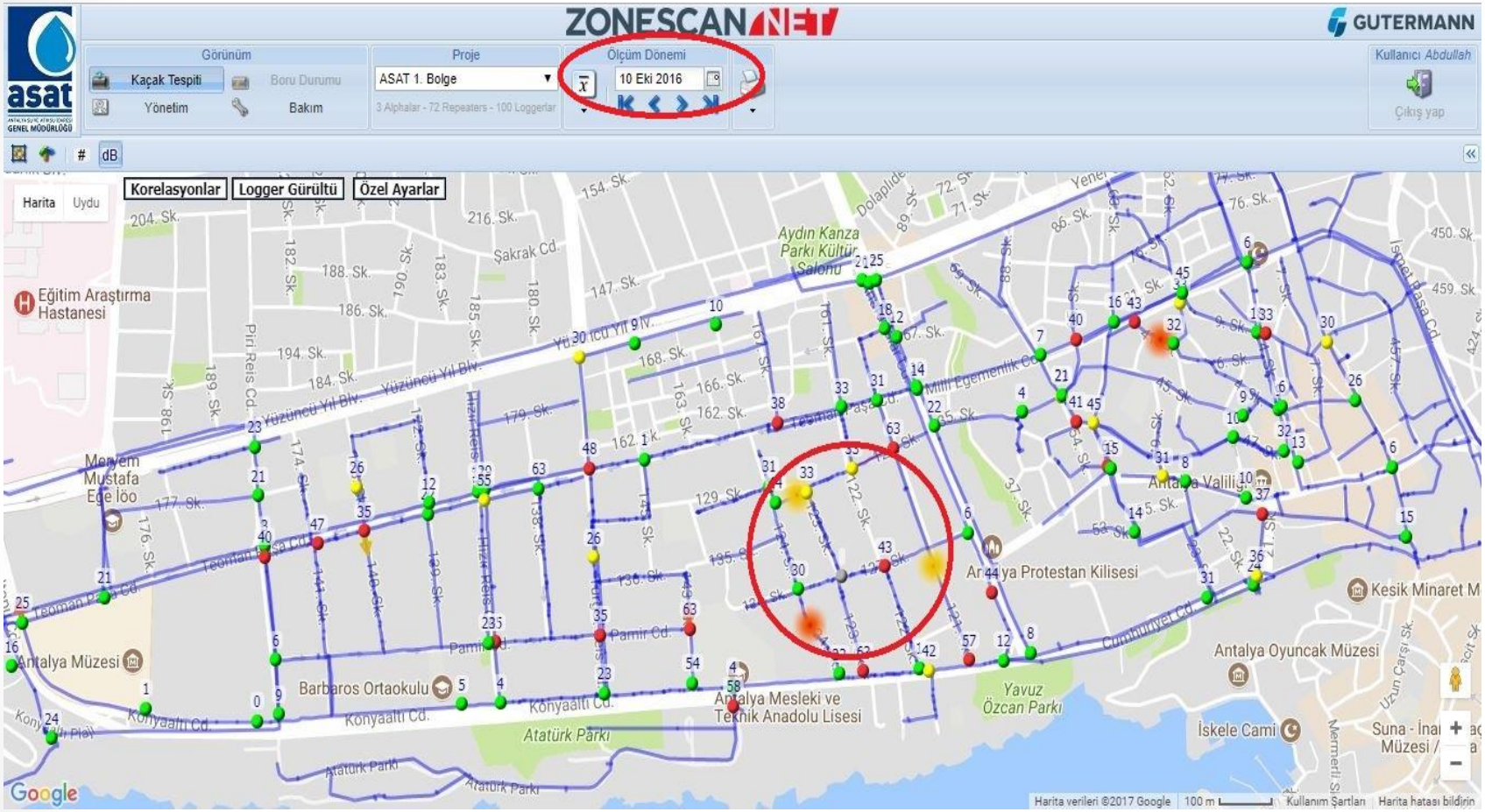
Application view



Animational view for the aplication and working principle.

Working Principle of the System



Possible leakage points is detected by the system and observed in detailed.

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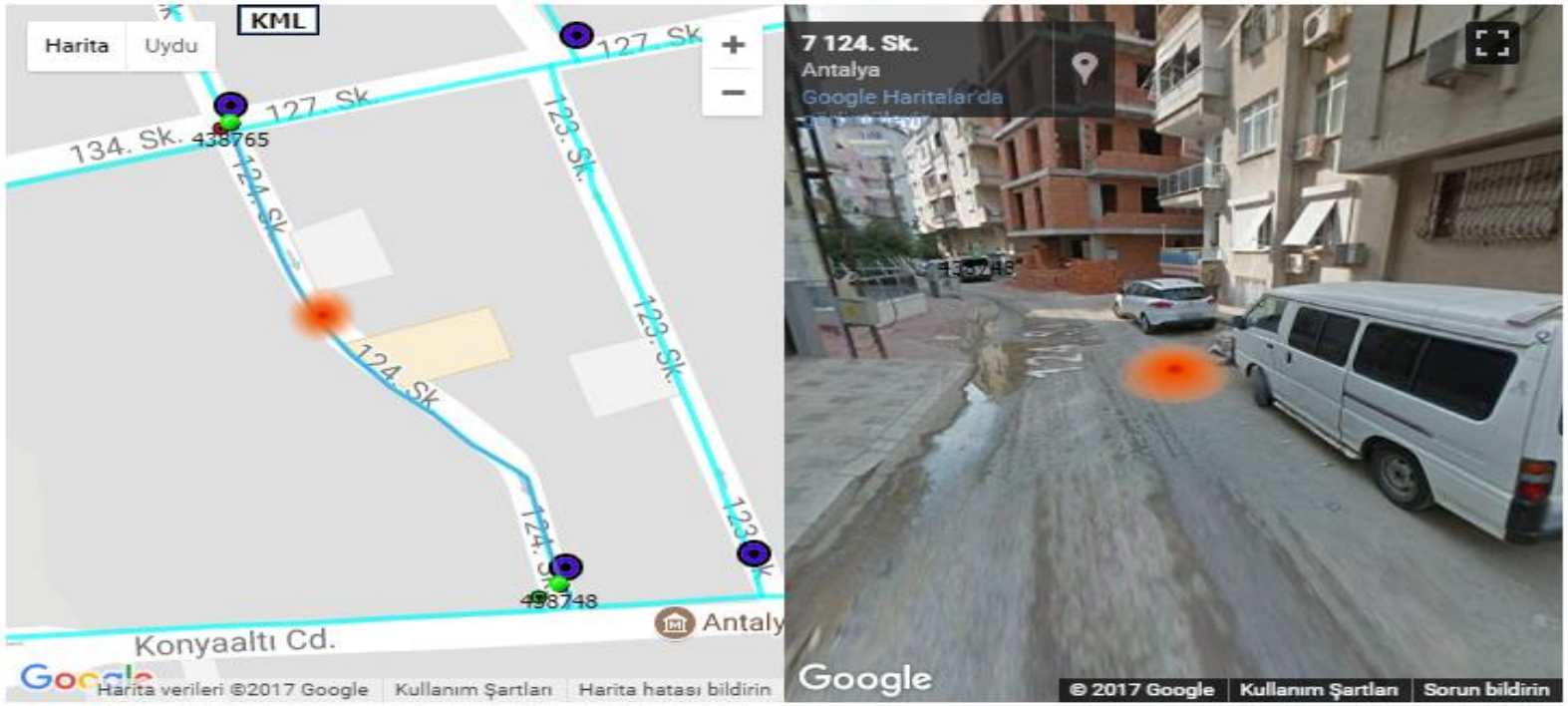
Working Principle of the System

Yazdır

ZONESCAN NET Korelasyon Raporu

ASAT 1. Bolge 2016-10-10 (Rapor oluşturuldu 2017-07-13 2:12 PM)



Korelasyon

Kalite	Lokasyon	Logger 1	Logger 2	Uzaklık	Uzaklık	Merkeze	Boru	Yorumlar
80	Deniz Mahallesi	438748	438765	94.1 m	57.6 m	18.3 m	151.7 m	

Detailed reports which are exported from the web software is to be delivered to field expert team.

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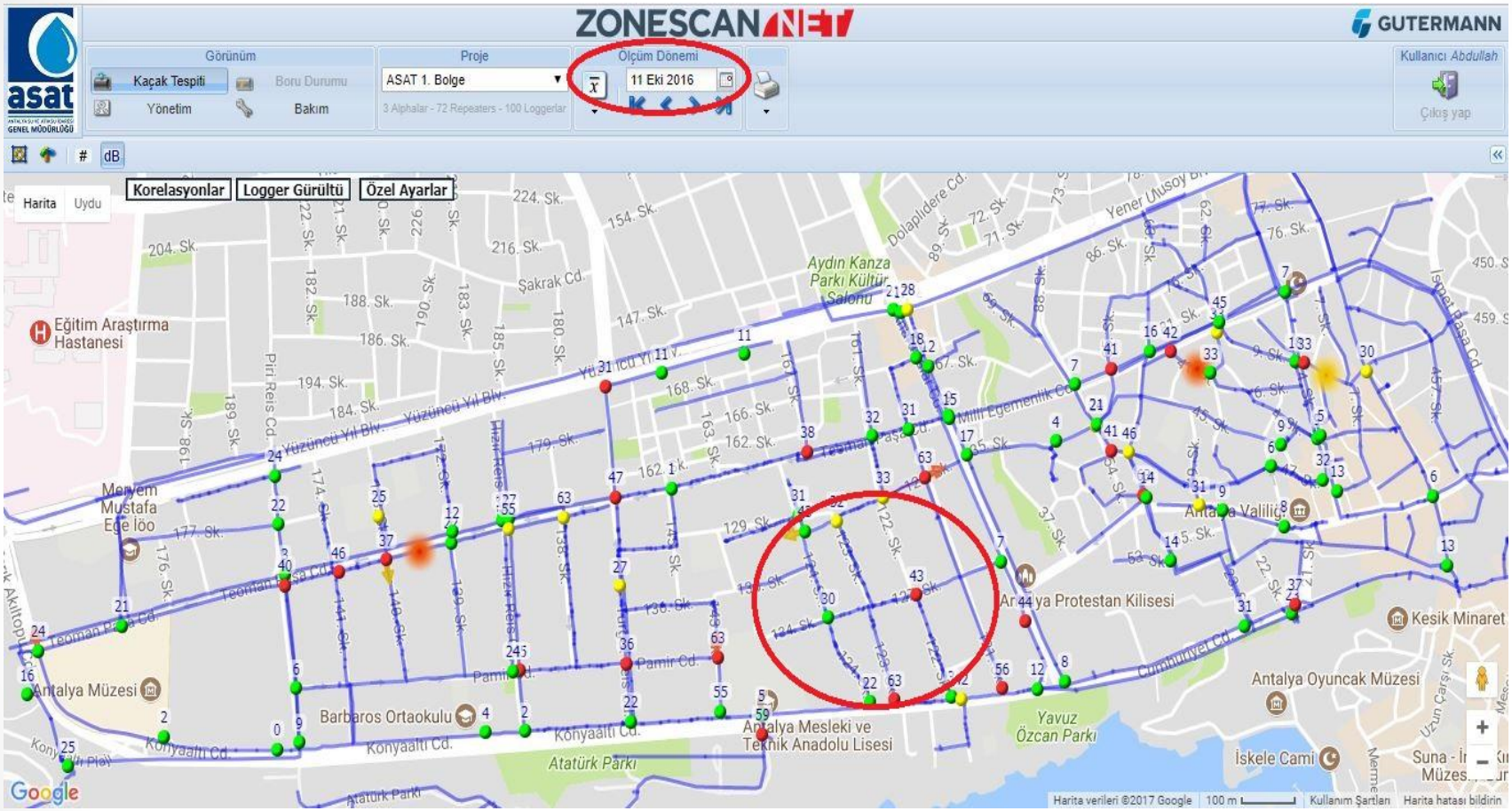
Working Principle of the System

Leak detection process is done by acoustic mics and reparing process starts.

Working Principle of the System



After repair, It is observed whether the repair is successful or not.

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Case Study Video

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Case Studies and References in Turkey

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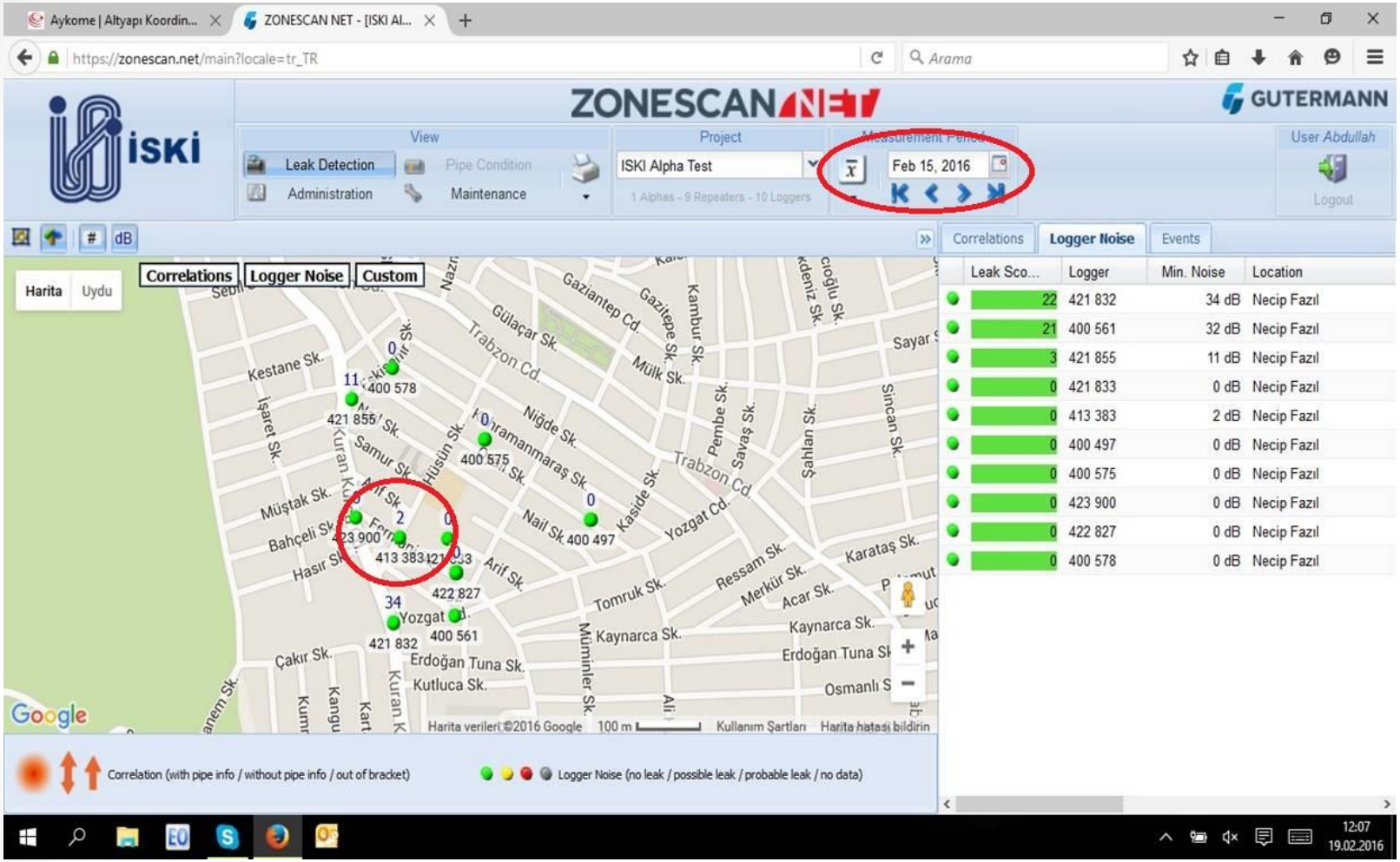
Case Study of ZoneScan Alpha (Istanbul)



1st day of leakage progress

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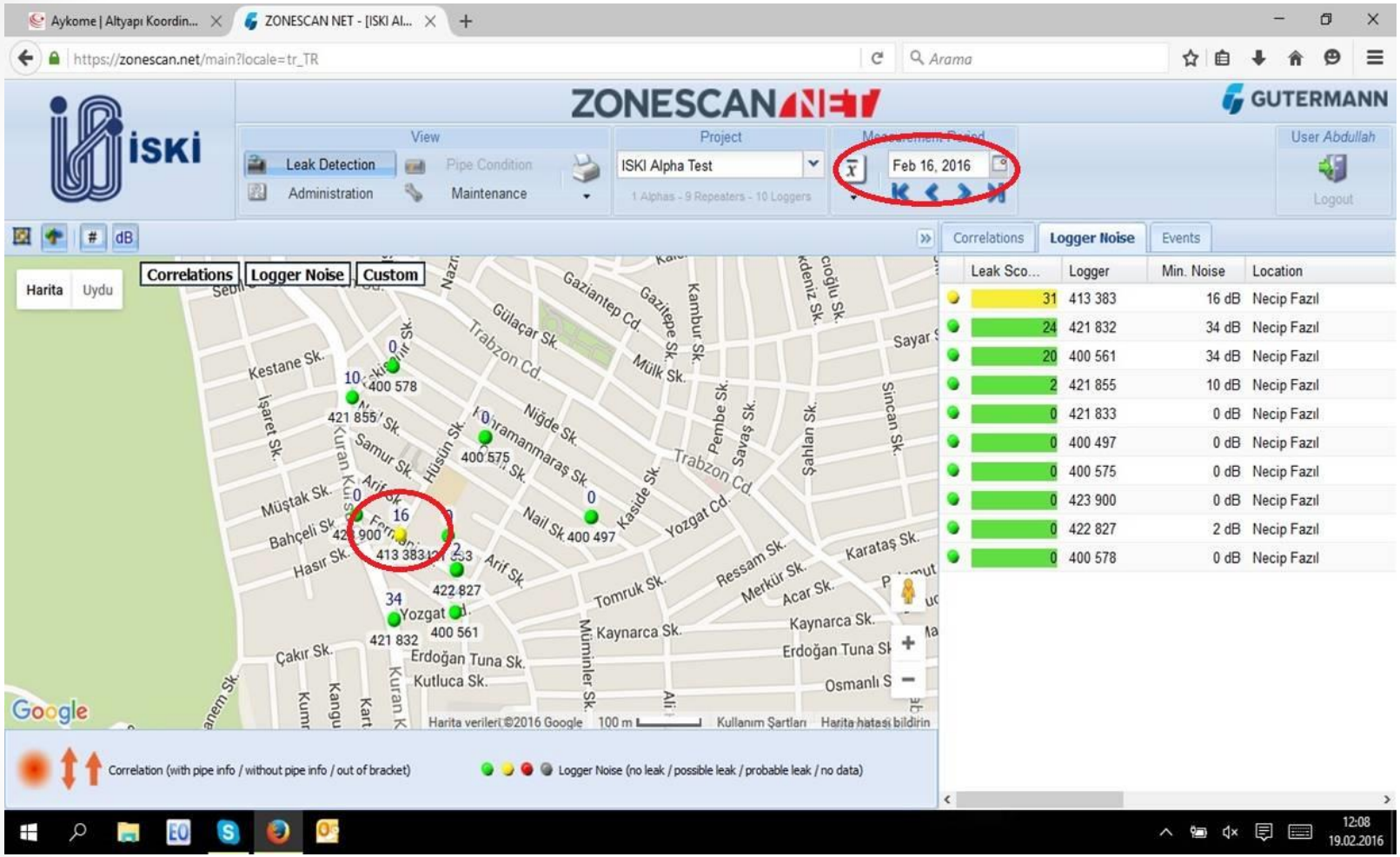
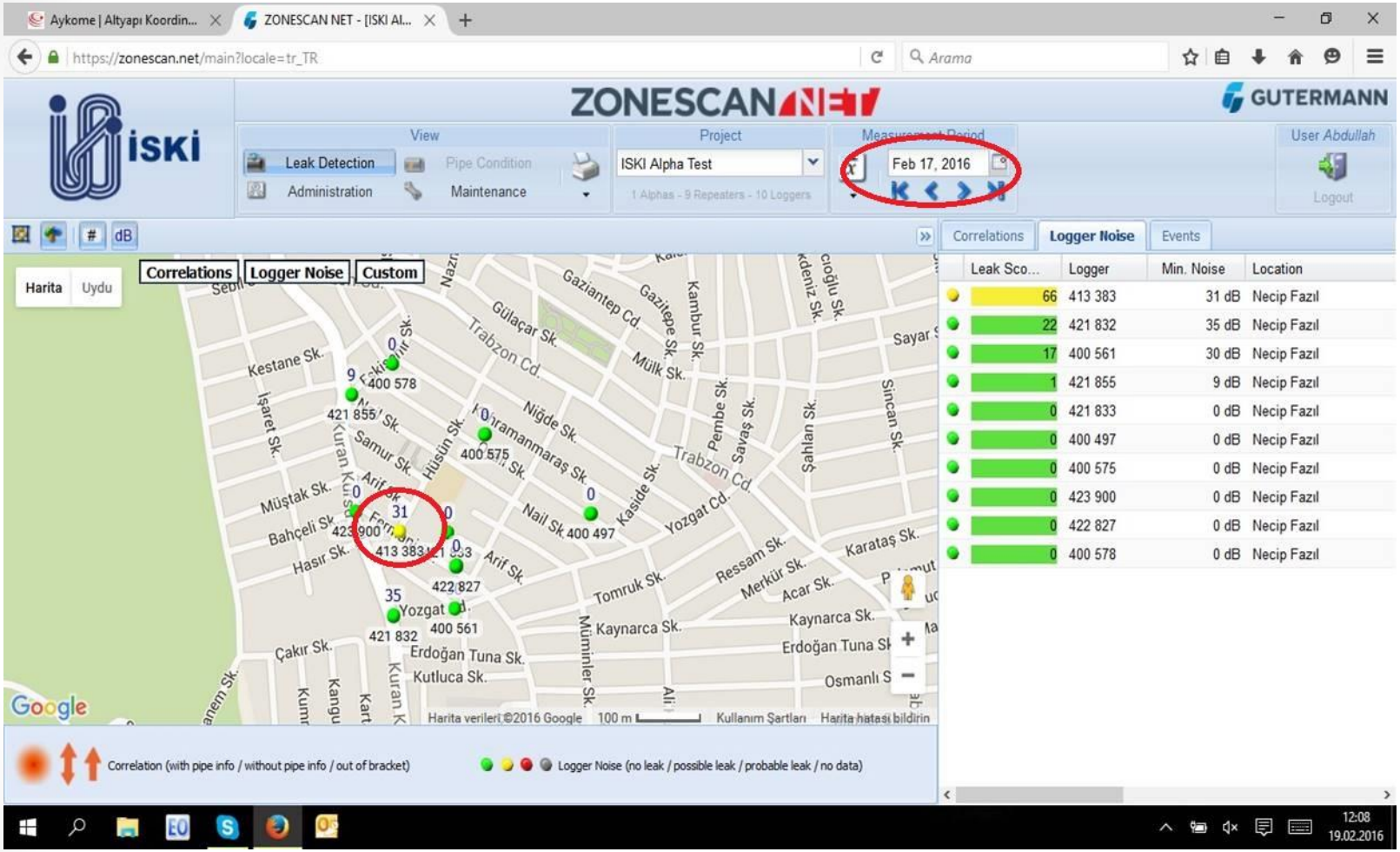
Case Study of ZoneScan Alpha (Istanbul)



2nd day of leakage progress

Case Study of ZoneScan Alpha (Istanbul)



3rd day of leakage progress

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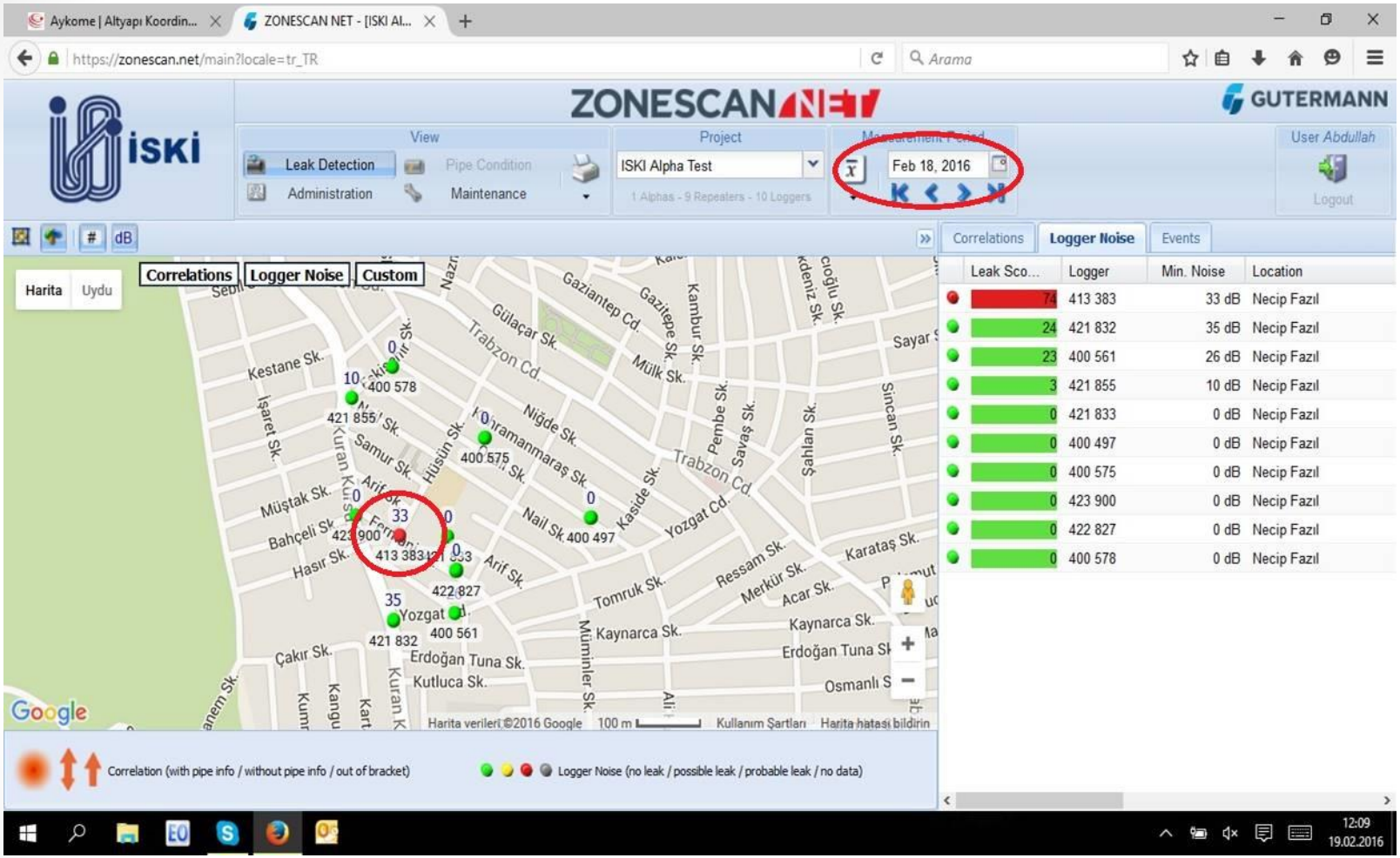
Case Study of ZoneScan Alpha (Istanbul)



4th day of leakage progress

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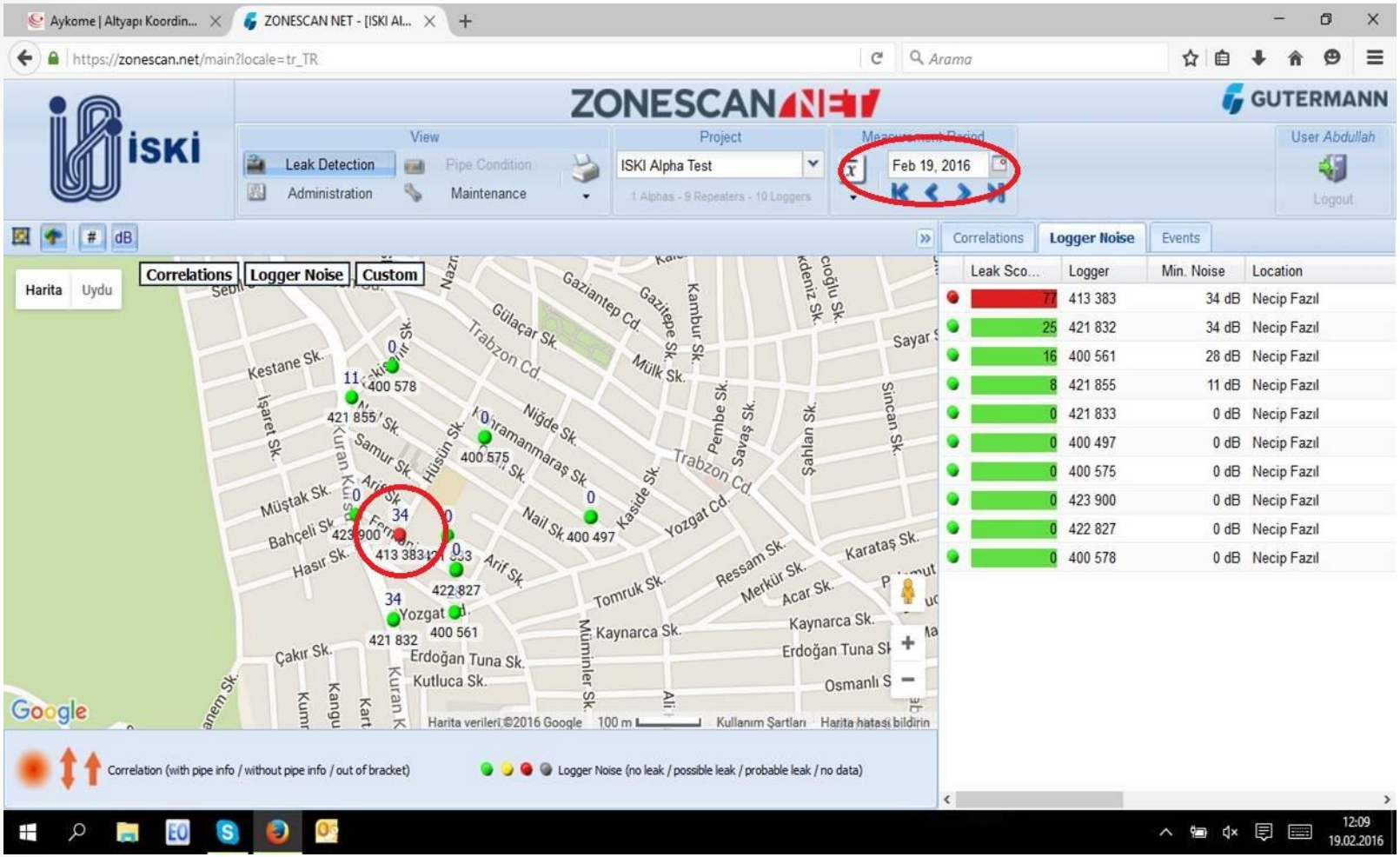
Case Study of ZoneScan Alpha (Istanbul)



5th day of leakage progress

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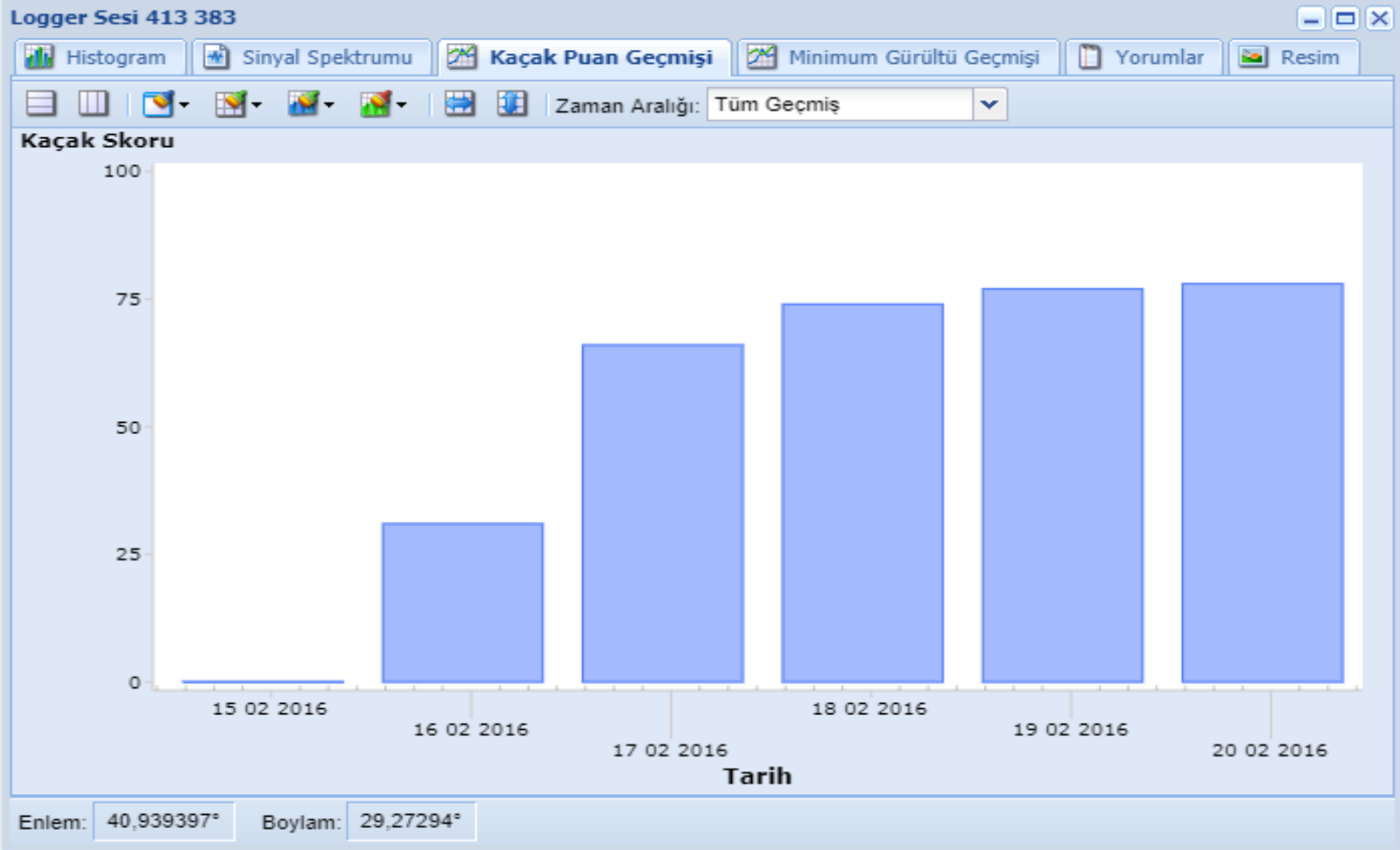
Case Study of ZoneScan Alpha (Istanbul)



Observation and tracking of the leakage progress.

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Case Study of ZoneScan Alpha (Antalya)

Detected leaks on Asbest and PE pipes while demonstrating.

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Case Study of ZoneScan Alpha (Antalya)

- **Prepration for repair**

- **Repair process after detection**

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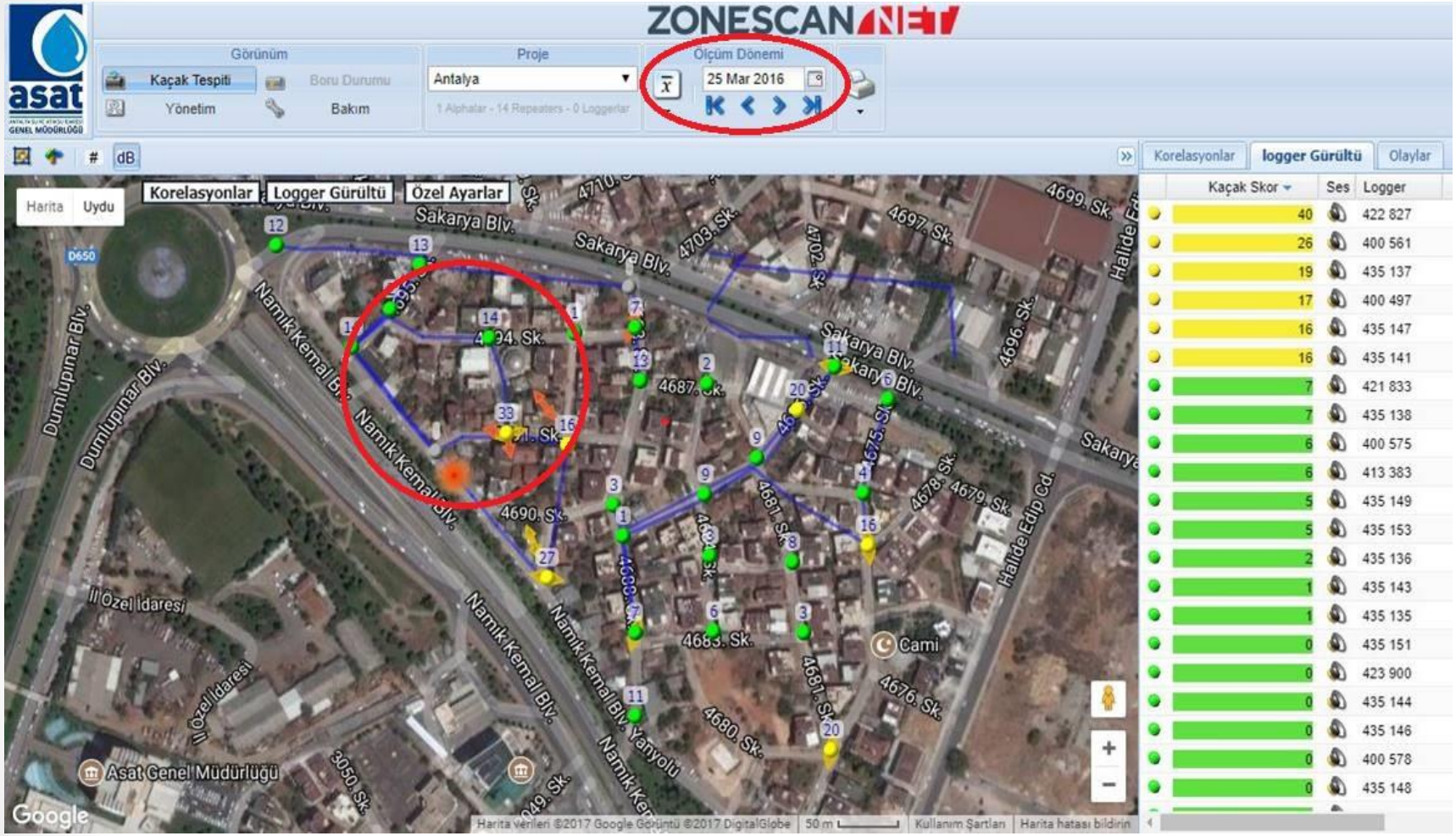
Case Study of ZoneScan Alpha (Antalya)



After repair, system detected a leakage at the same point.

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Case Study of ZoneScan Alpha (Antalya)

- **Instrument detected a leak at the same point, normally it is not supposed to happen again.**

- **But then it is understood that the repair was not successfull.**

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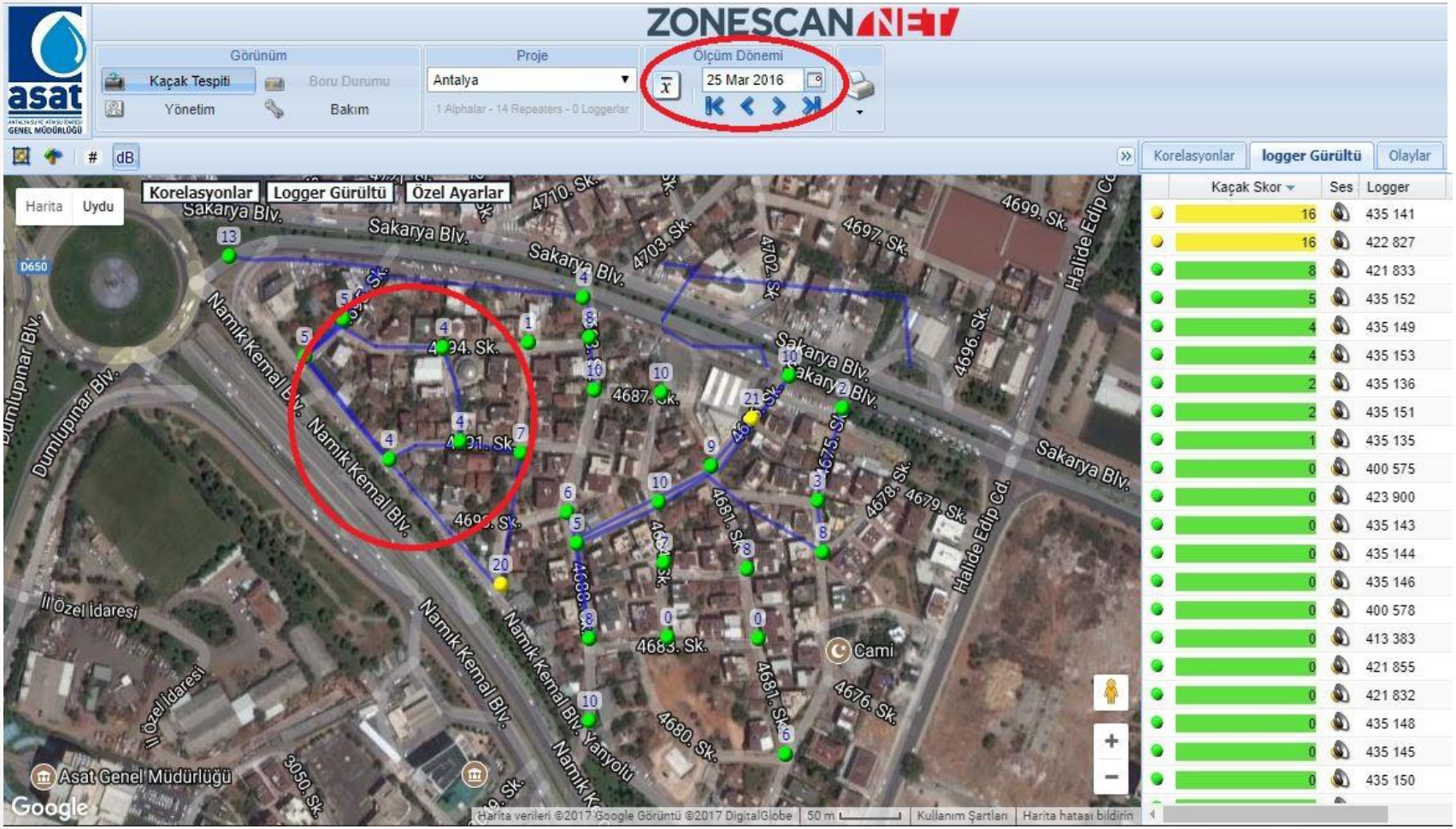
Case Study of ZoneScan Alpha (Antalya)



Leaks has been repaired and monitored for the further leakages.

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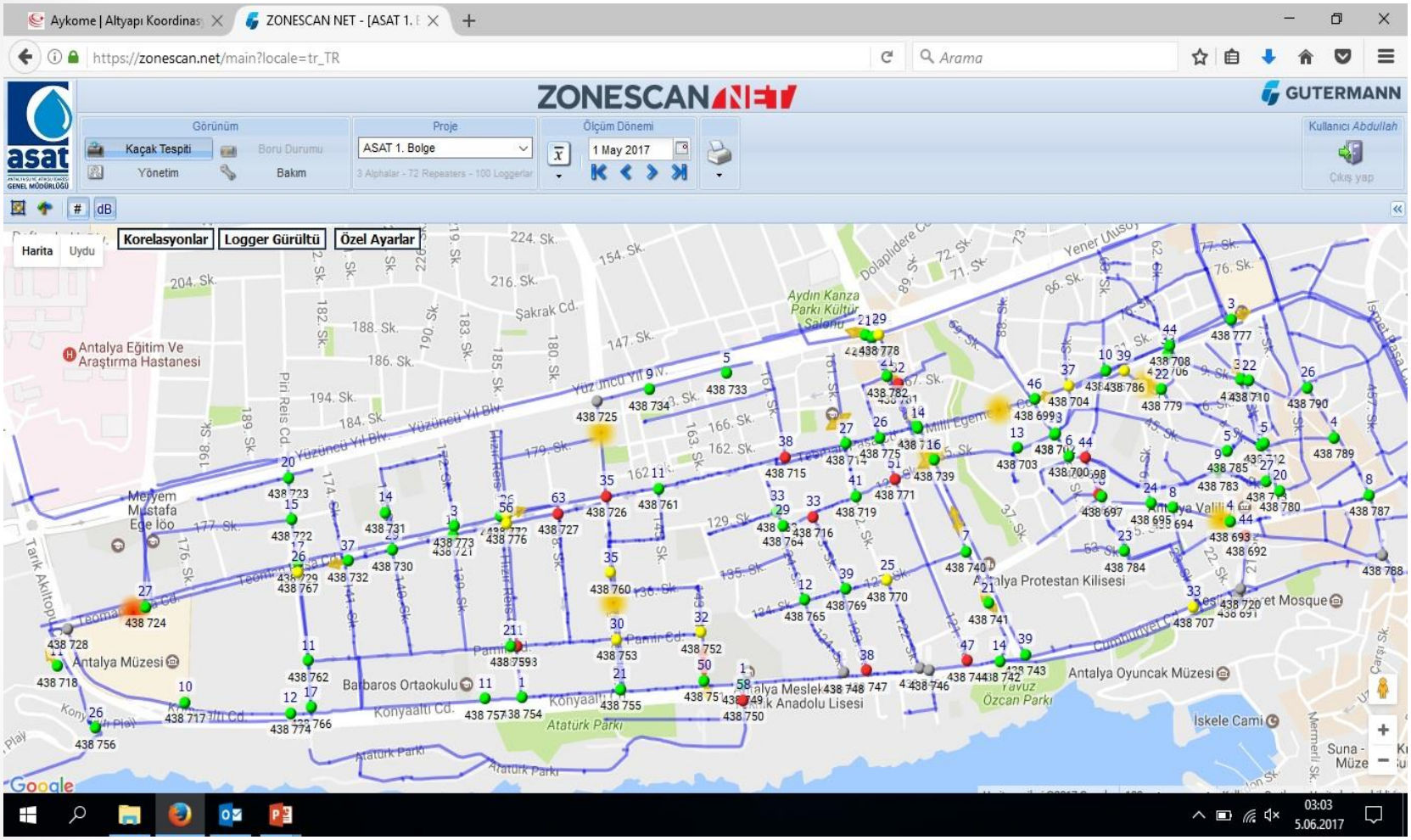
Case Study of ZoneScan Alpha (Antalya)



100 stationary loggers are located for a year.
Approx. 70 leaks are detected and repaired.

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Feedback and Profitability

Diameter mm	Liter per hour	Metercube per day
1,00	58,00	1,39
2,00	190,00	4,56
3,00	490,00	11,70
4,00	890,00	21,40
5,00	**1.340,00**	**32,00**
6,00	1.800,00	43,20
7,00	2.360,00	56,80

Sample Leakage Profitability (Based on Antalya ASAT project)

Number of Leakages	Total hole diameter mm(5 bar)	Leakage Amount m3/month	Leakage Amount m3/year	Loss per year	Loss on profit	Description
1	5	960	11.520	8.985,60 ₺	42.624,00 ₺	In accordance of IWA Datas
60	1.000	192.000	2.304.000	1.797.120,00 ₺	8.524.800,00 ₺	Detected leakages on the installed system
240	3.000	576.000	6.912.000	5.391.360,00 ₺	25.574.400,00 ₺	Detected but not yet repaired leakages

* avg. cost of 1m3 water 0,78 TL -- Istanbul 0,95, Ankara 0,85, Antalya 0,55

* avg. selling price of 1m3 water 3,7 TL -- Istanbul 4,45, Ankara 3,98, Antalya 2,68

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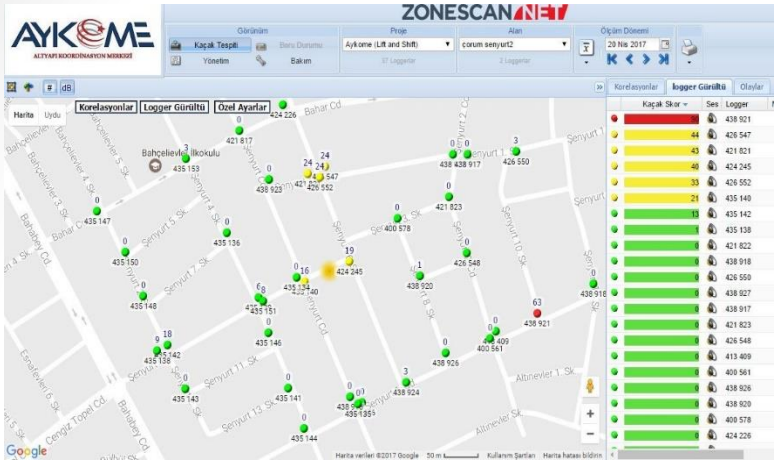
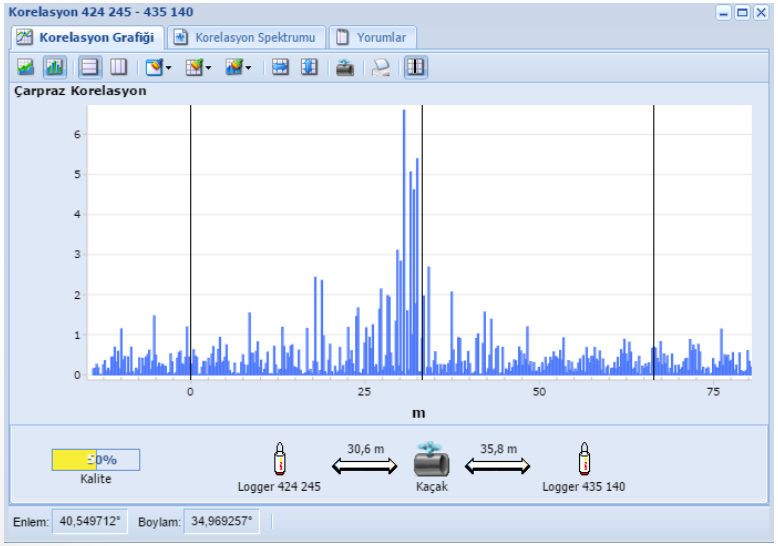
Case Study of ZoneScan 820 (Çorum)





A leakage point with a low possibility has been detected.

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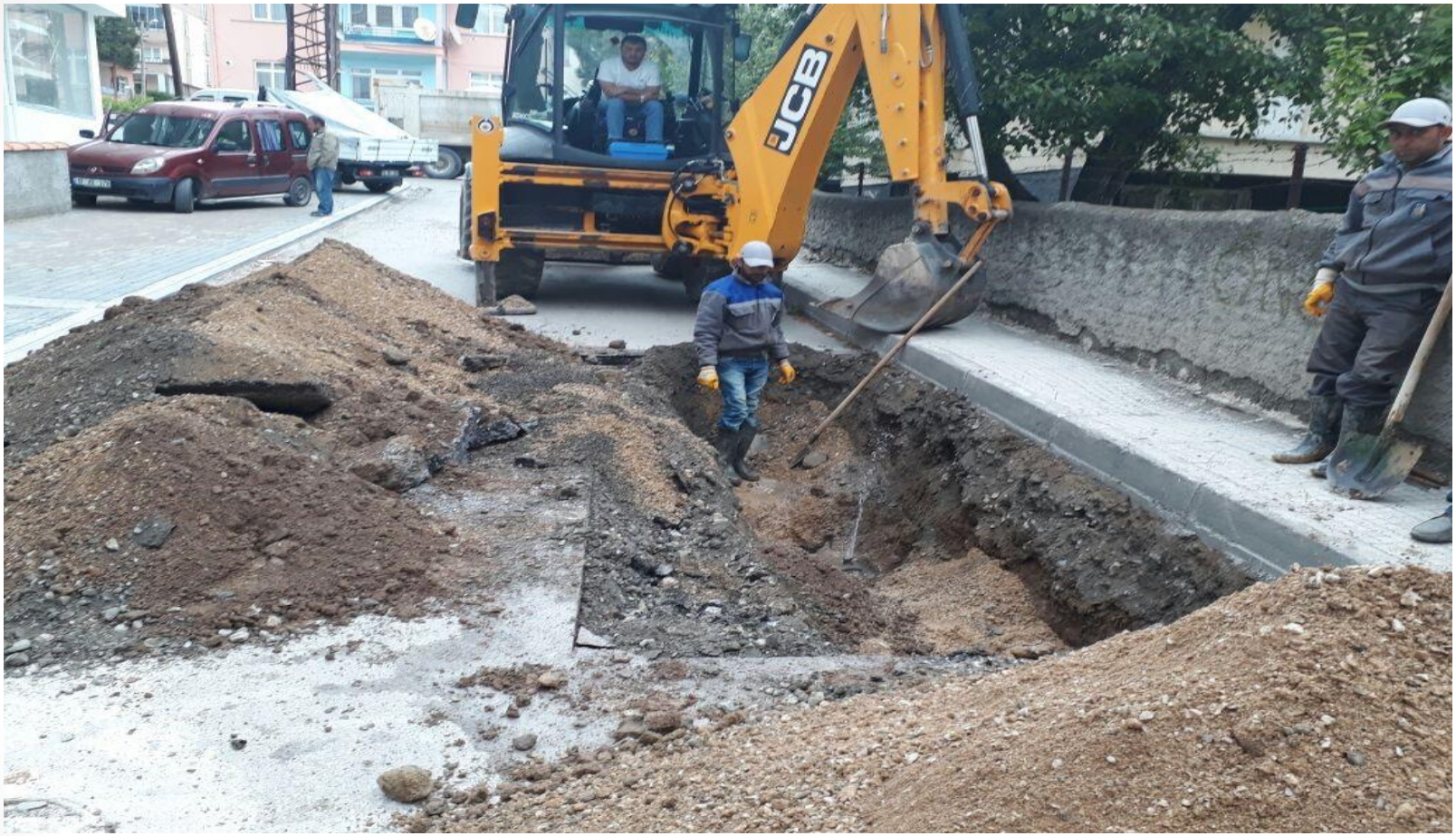
Case Study of ZoneScan 820 (Çorum)



After a field operation existence of the leakage has been repaired.

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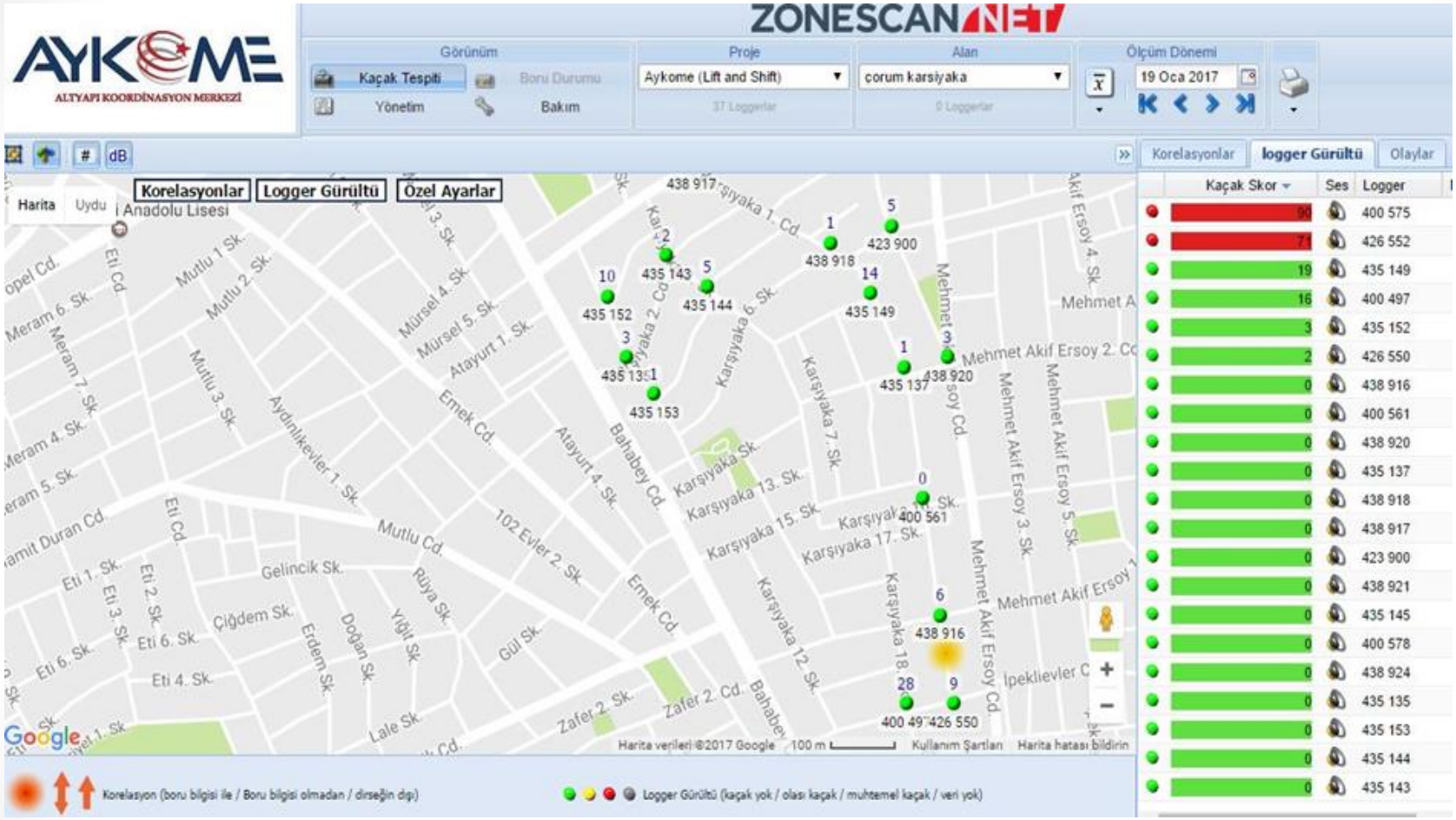
Case Study of ZoneScan 820 (Çorum)



Not just noises with high frequencies are doing correlation but the noises with low frequencies are doing correlation too.

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Case Study of ZoneScan 820 (Çorum)

- **Leakage has been detected on the side of a customer.**

- **And repaired by the field expert team**

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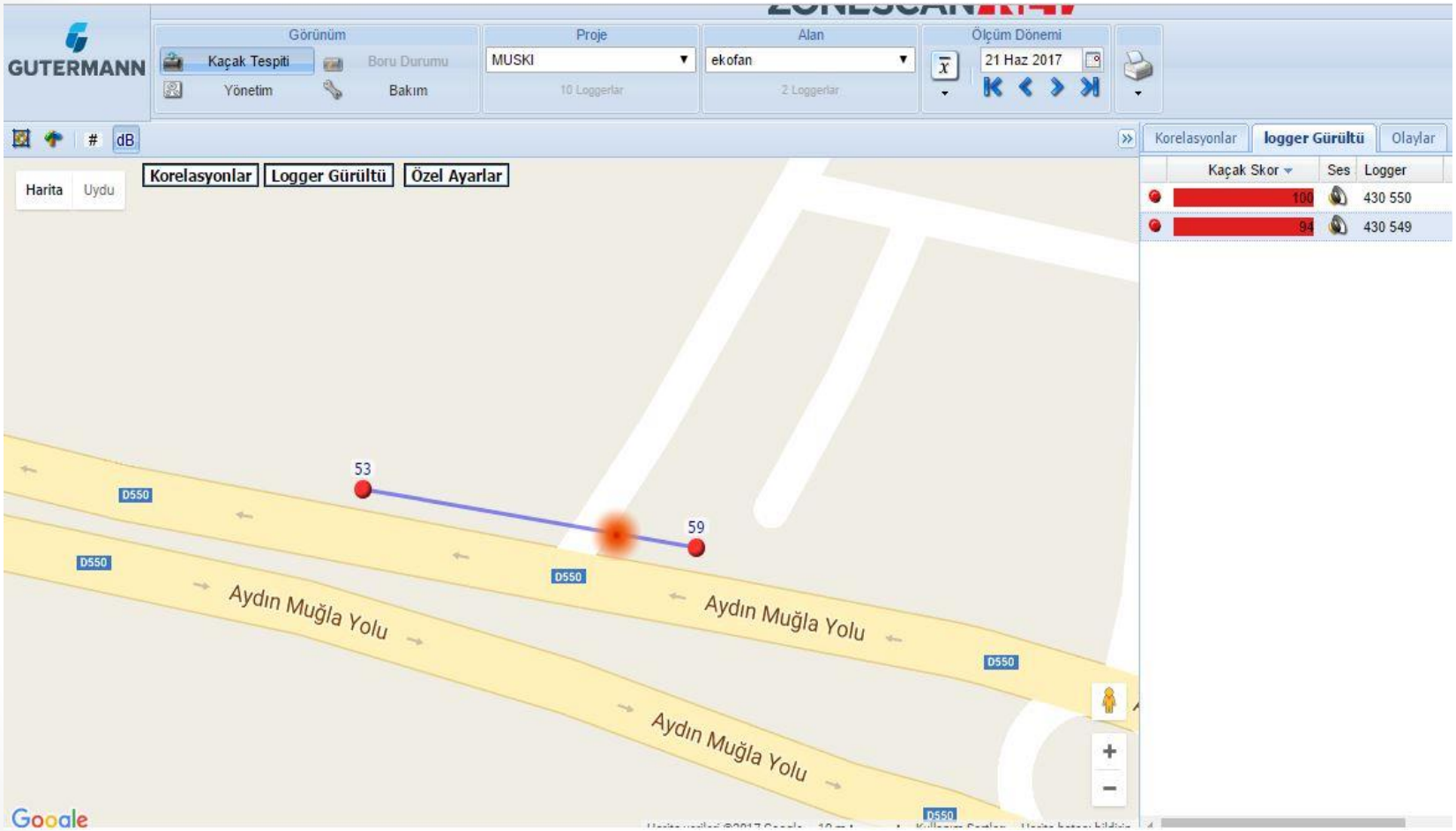
Case Study of ZoneScan 820 (Muğla)



A detected leakage on a transportation pipe with the diameter of 400mm.

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Case Study of ZoneScan 820 (Muğla)

- **Leak scores (100 & 94) of two loggers showed us precise leakage on the software.**
- **Field expert team opened the point and saw how big was the leak.**
- **The leak is seen at the joint part. It was quite big when it is completely opened.**

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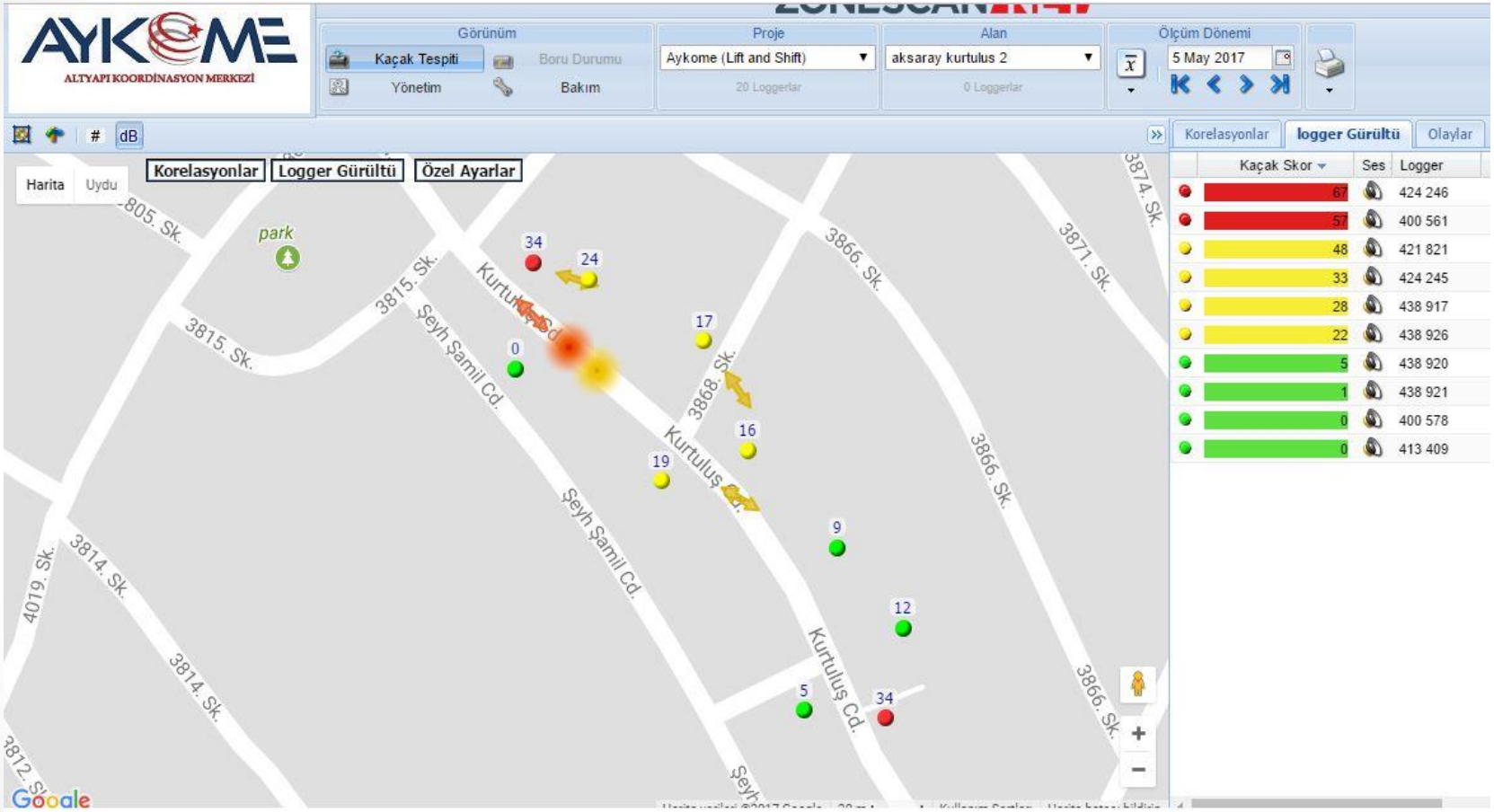
Case Study of ZoneScan 820 (Aksaray)



Two close lekage points detected and identified.

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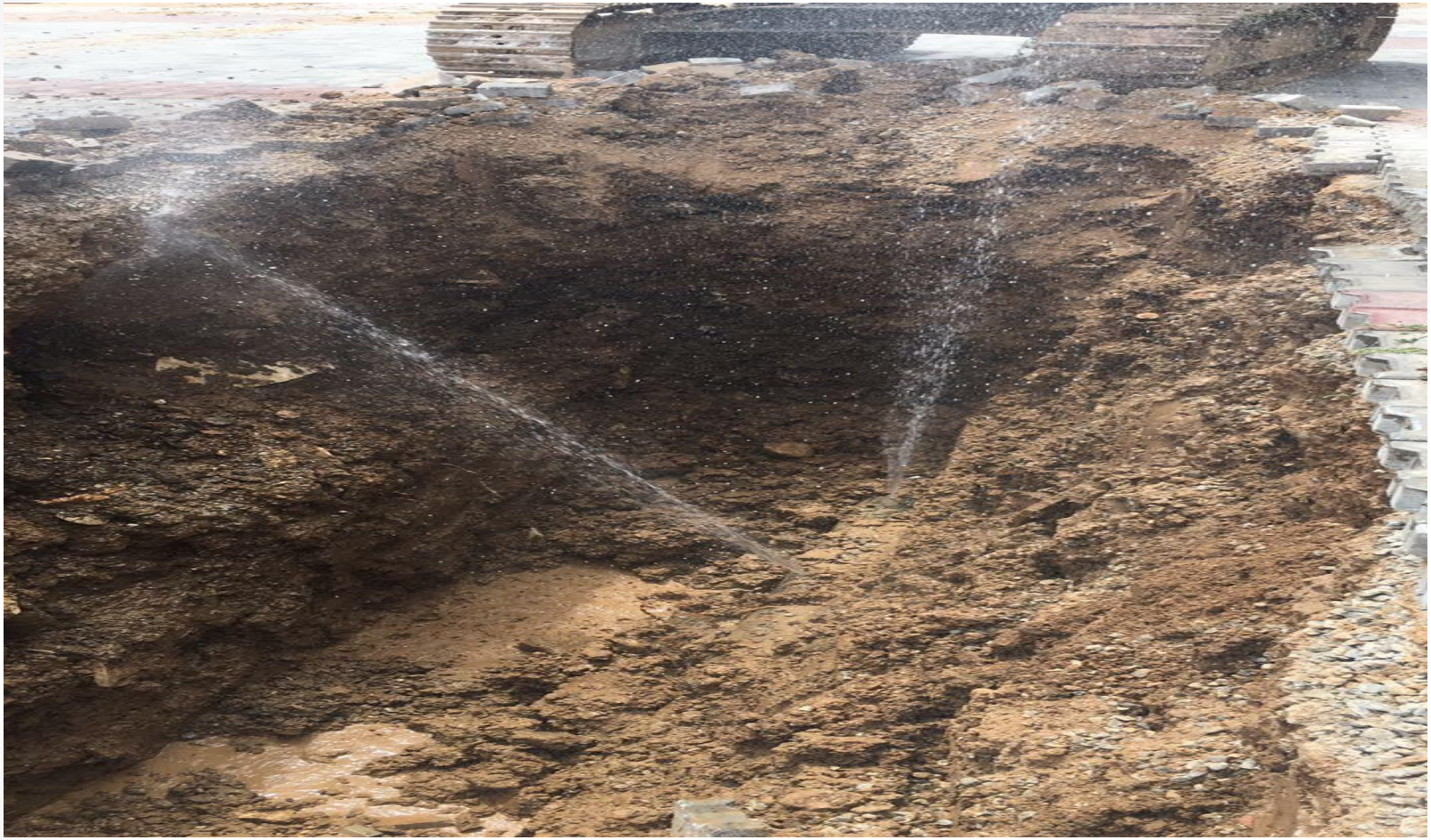
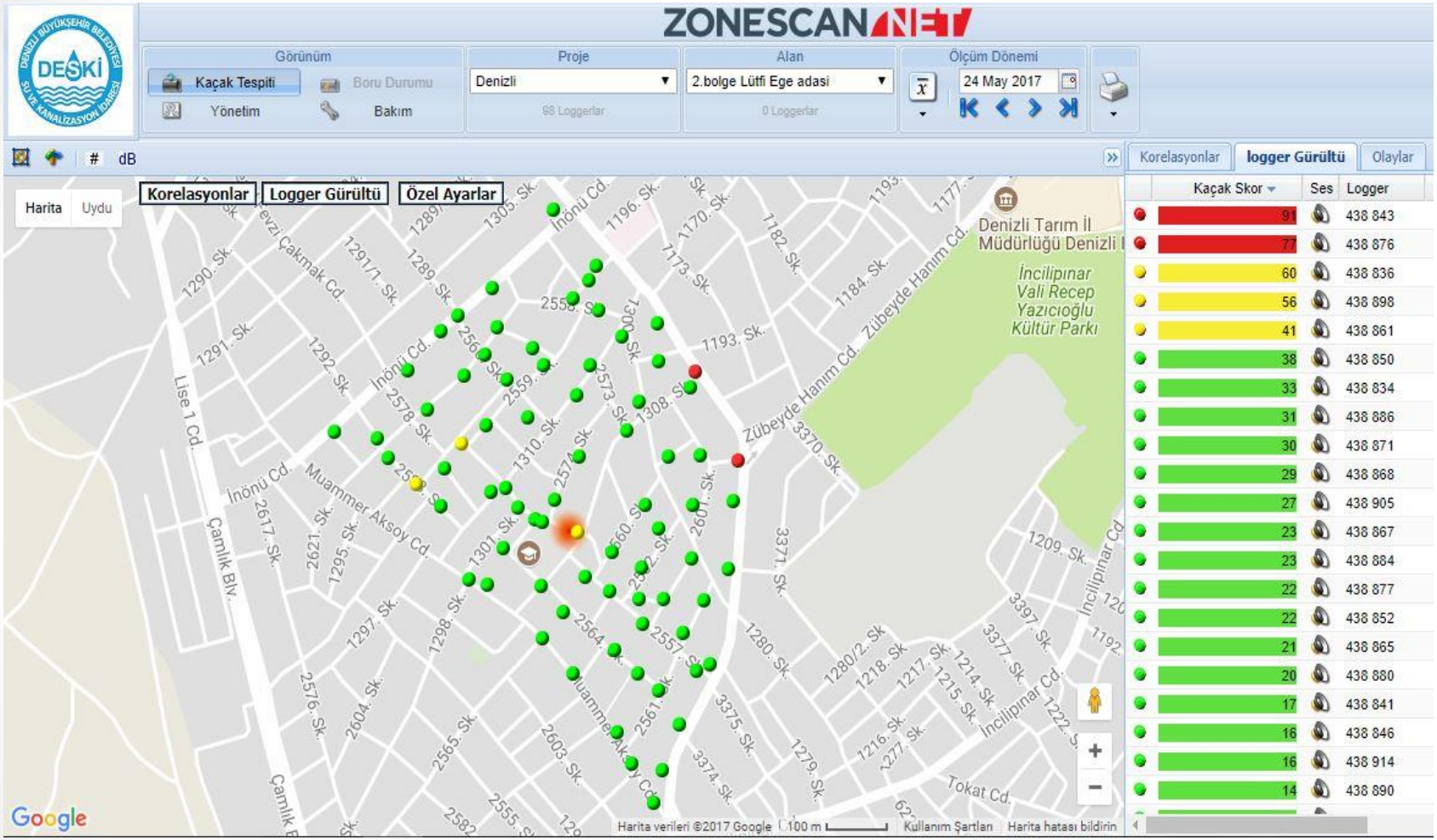
Case Study of ZoneScan 820 (Aksaray)



One high and one low possible leaks detected by the software and identified by the field expert team.

Case Study of ZoneScan 820 (Denizli)



An application with the number of 90 correlating loggers and leakage detection.

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Case Study of ZoneScan 820 (Denizli)

Detected leakage on house connection.

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Case Study of ZoneScan 820 (Bolu)

A screenshot of significant valve defect on the software.

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Case Study of ZoneScan 820 (Bolu)

Identified a valve defect.

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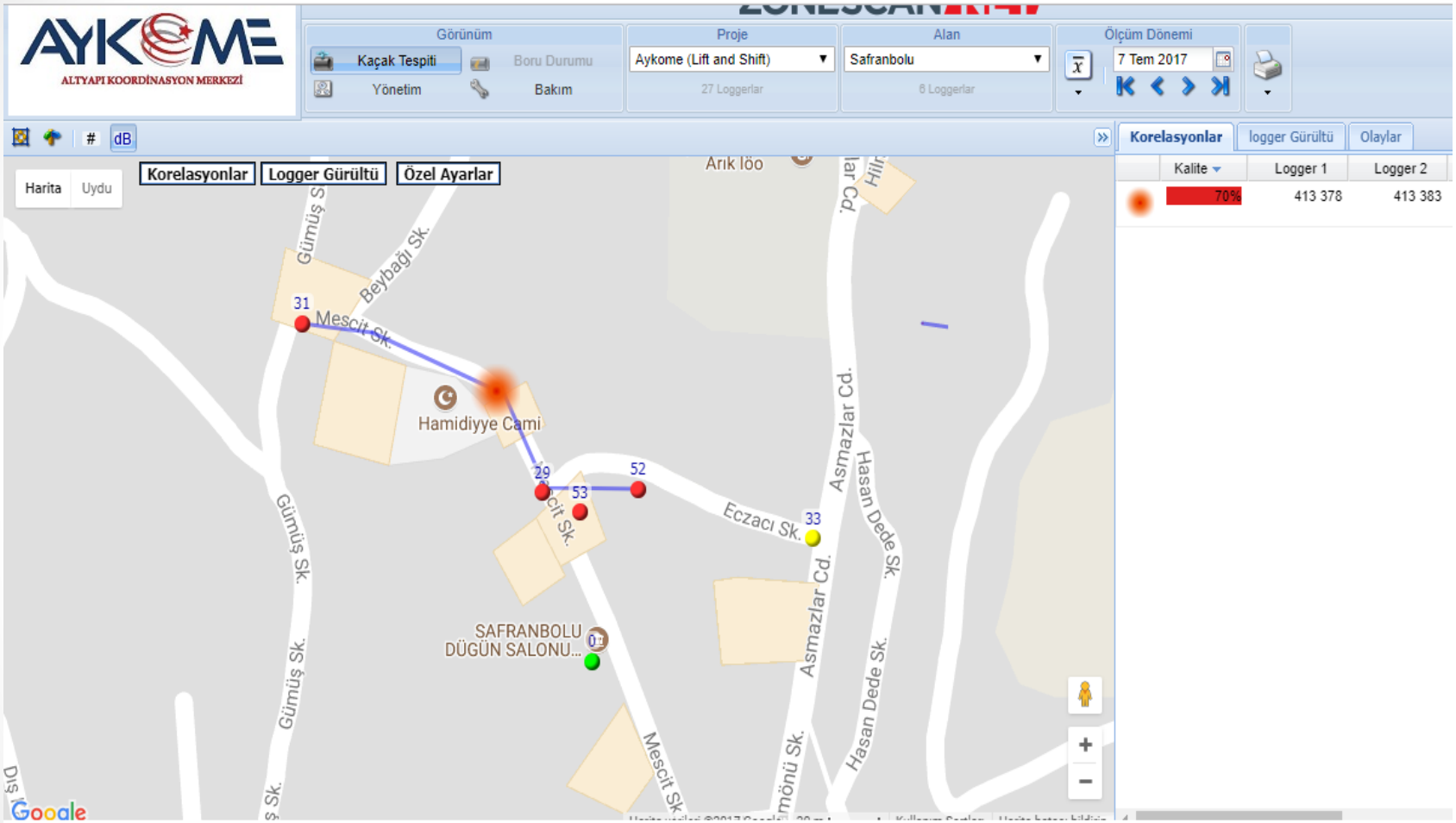
Case Study of ZoneScan 820 (Safranbolu)



Leak detection application via house connection points.

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Case Study of ZoneScan 820 (Safranbolu)

Detected leakage point on a house connection.

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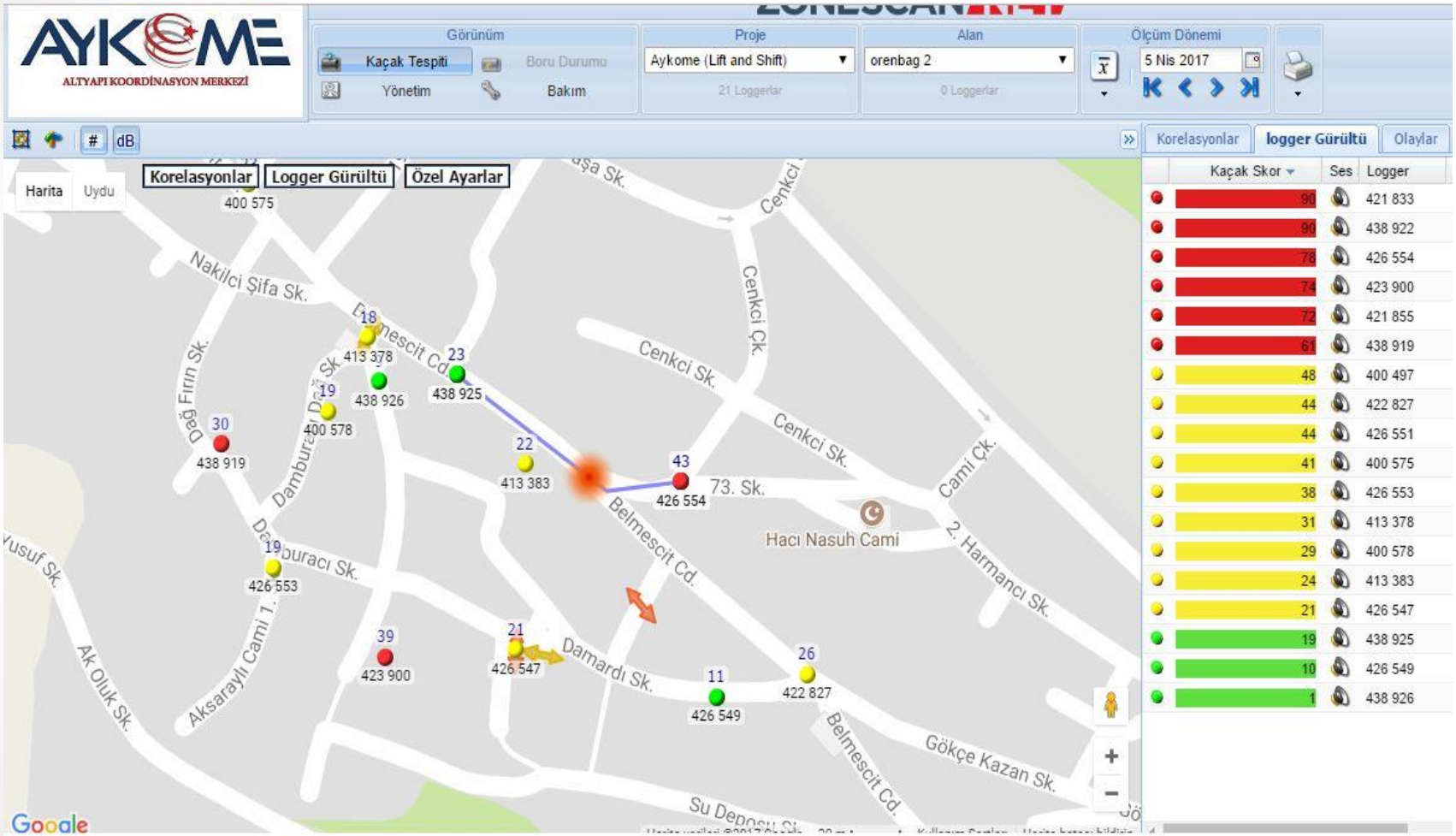
Case Study of ZoneScan 820 (Afyon)



Application on a Polyethilen pipe and detected leakage point.

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Case Study of ZoneScan 820 (Afyon)

Related picture of the leakage while repairing.

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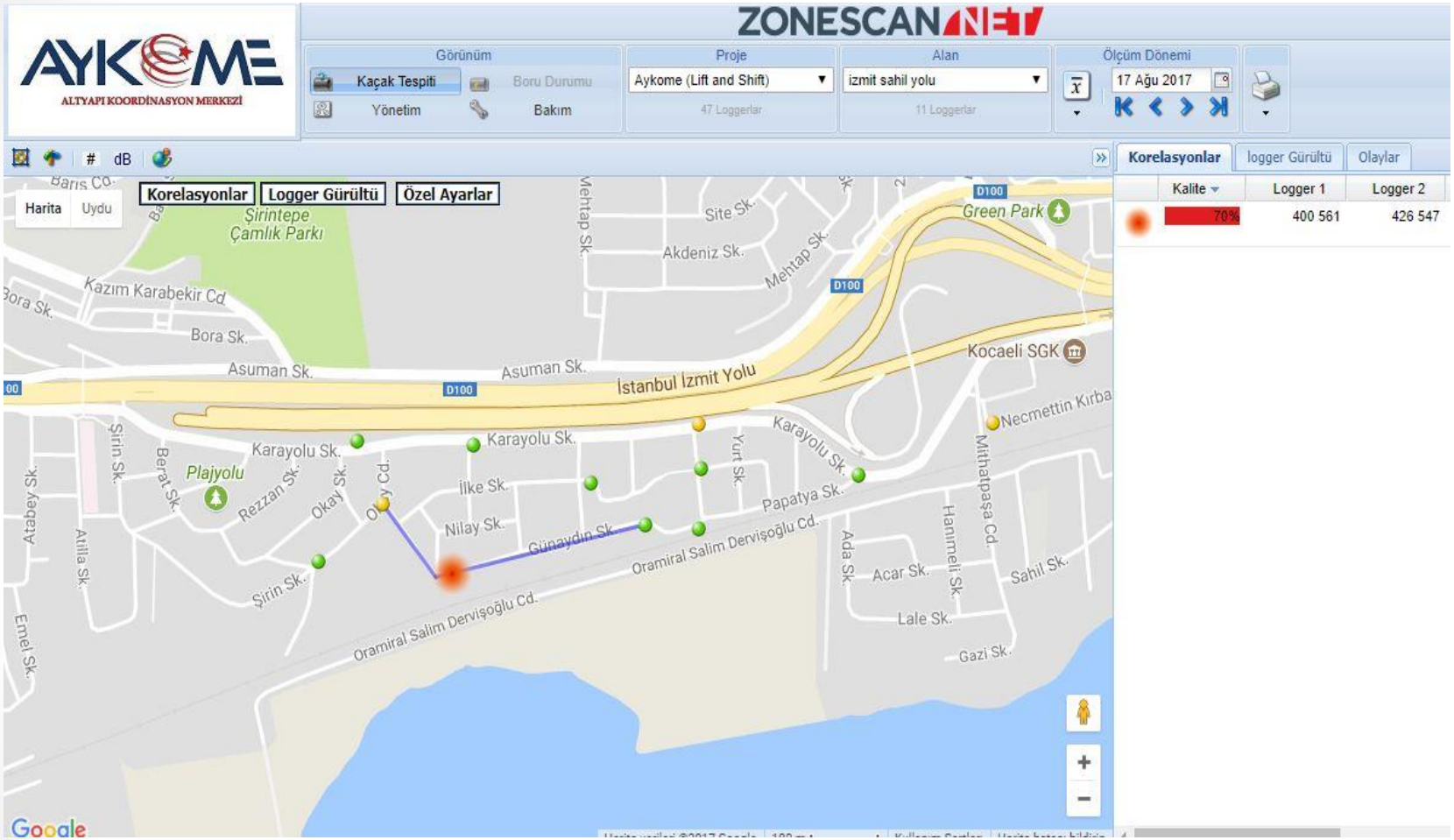
Case Study of ZoneScan 820 (Kocaeli)



Leakage detection from two loggers which have low leak score.

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Case Study of ZoneScan 820 (Kocaeli)

Altough the leak scores were low, the field expert team has identified a leakage in Case Study of Izmit.

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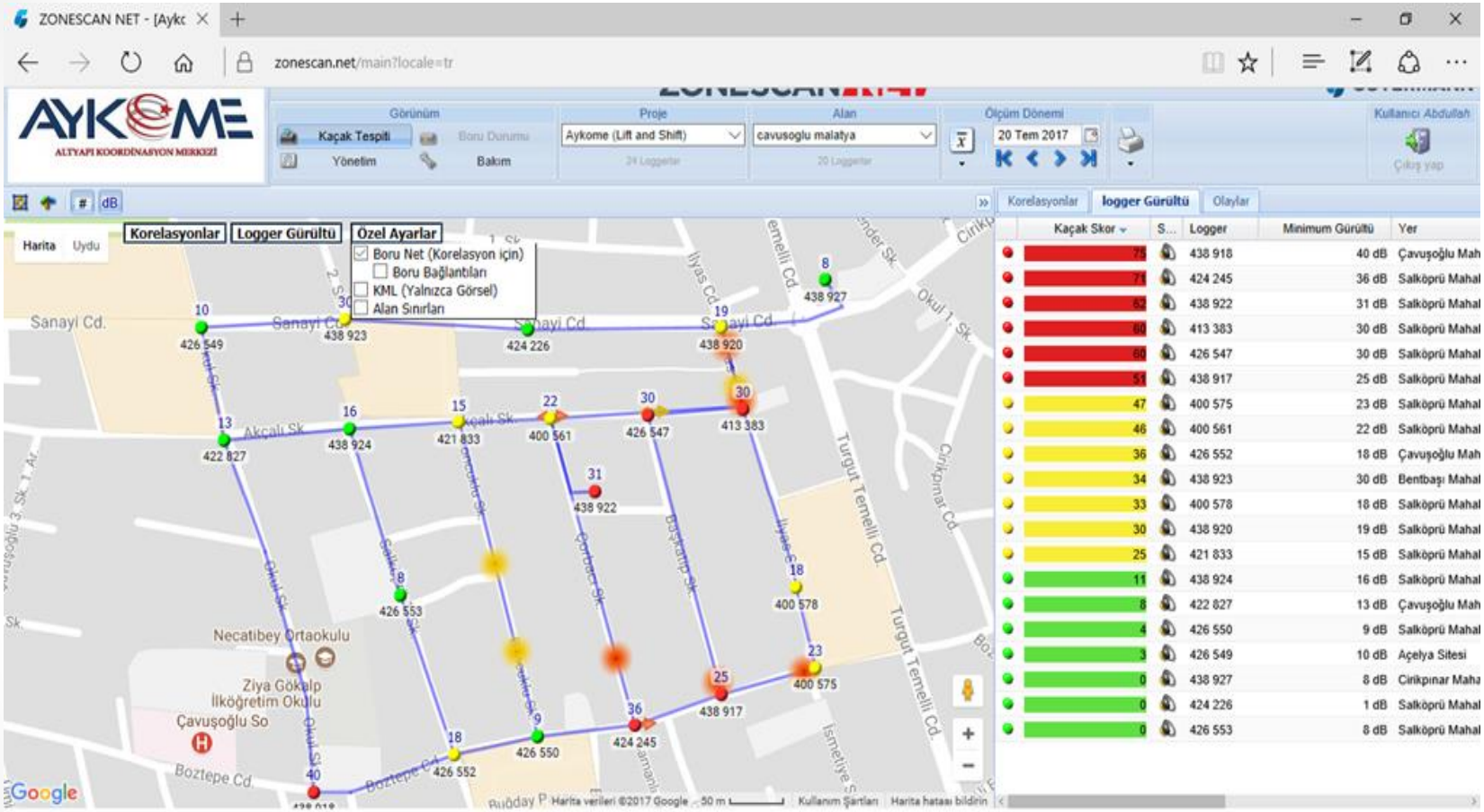
Case Study of ZoneScan 820 (Malatya)



There are a lot of leak possibilities at the same place.

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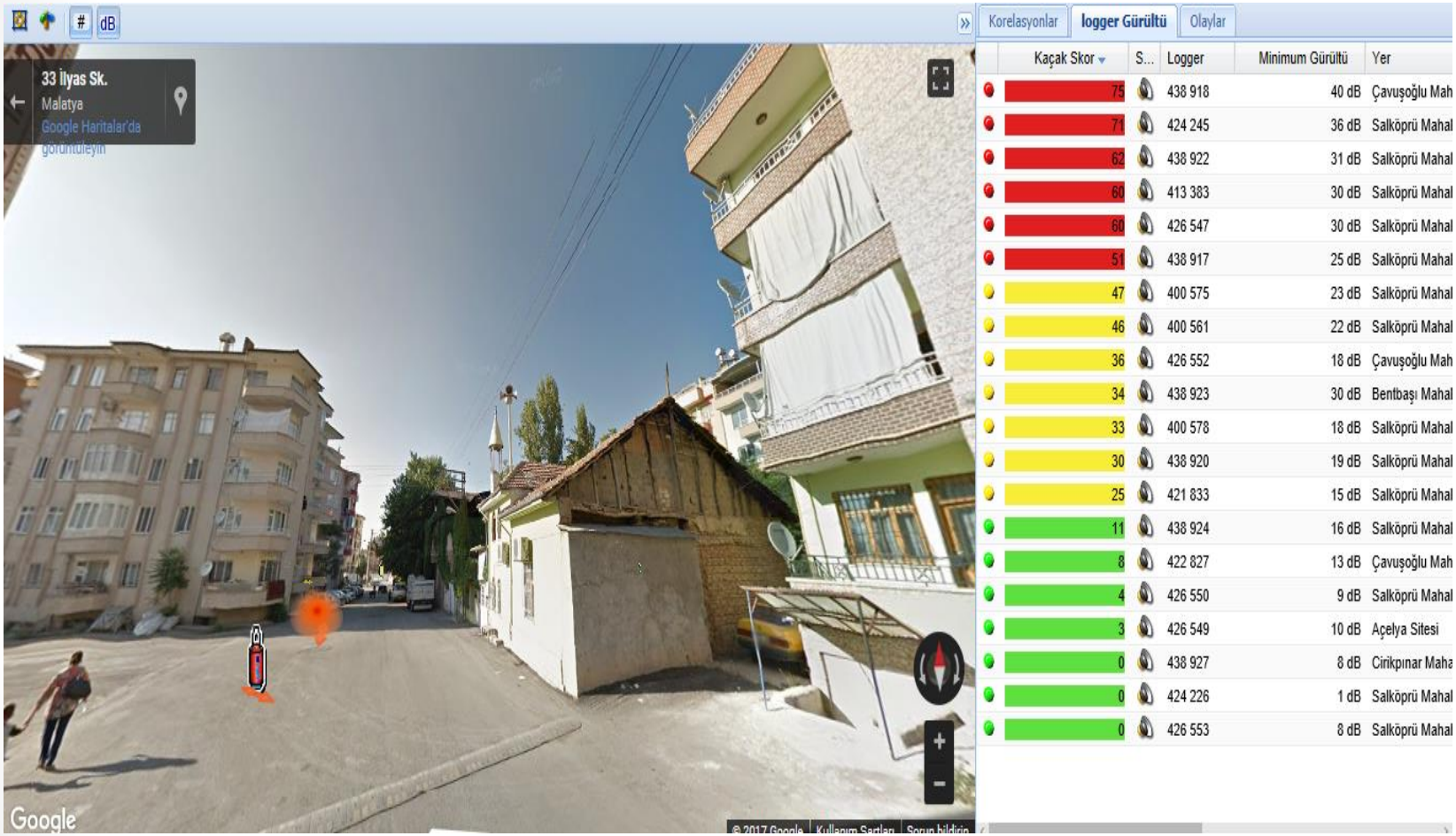
Case Study of ZoneScan 820 (Malatya)



Street view of a leak which is automatically correlated.

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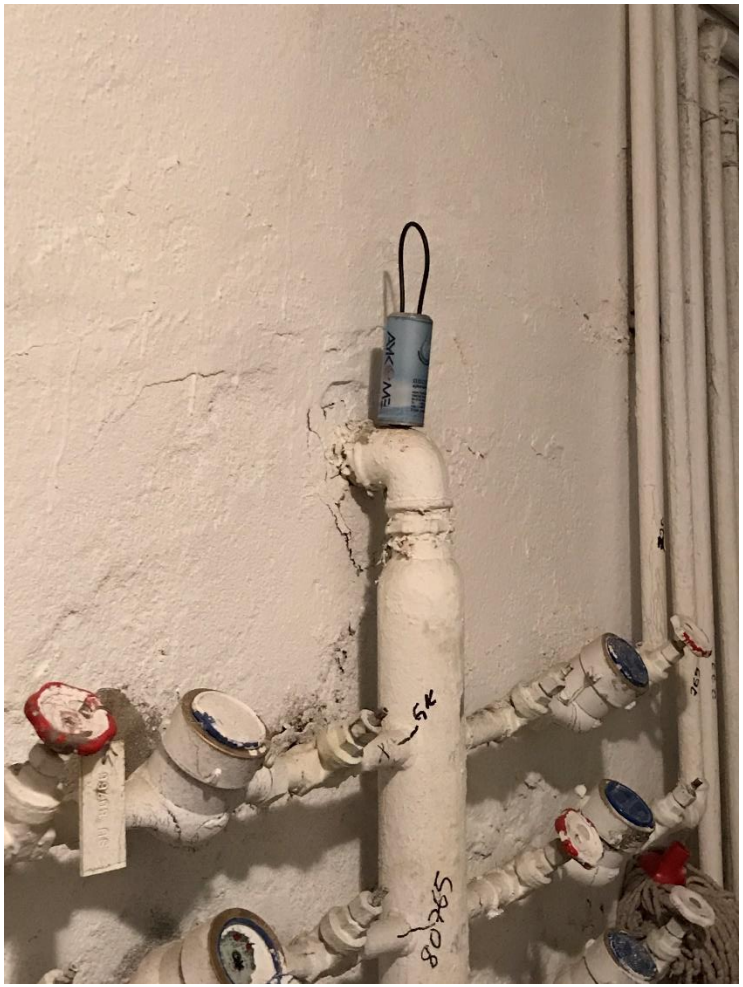
Case Study of ZoneScan 820 (Kayseri)



Loggers are placed into chambers and house connections.

Case Study of ZoneScan 820 (Kayseri)

Leaks are pointed as shown by the operators. They are almost exact points giving by the correlating loggers.

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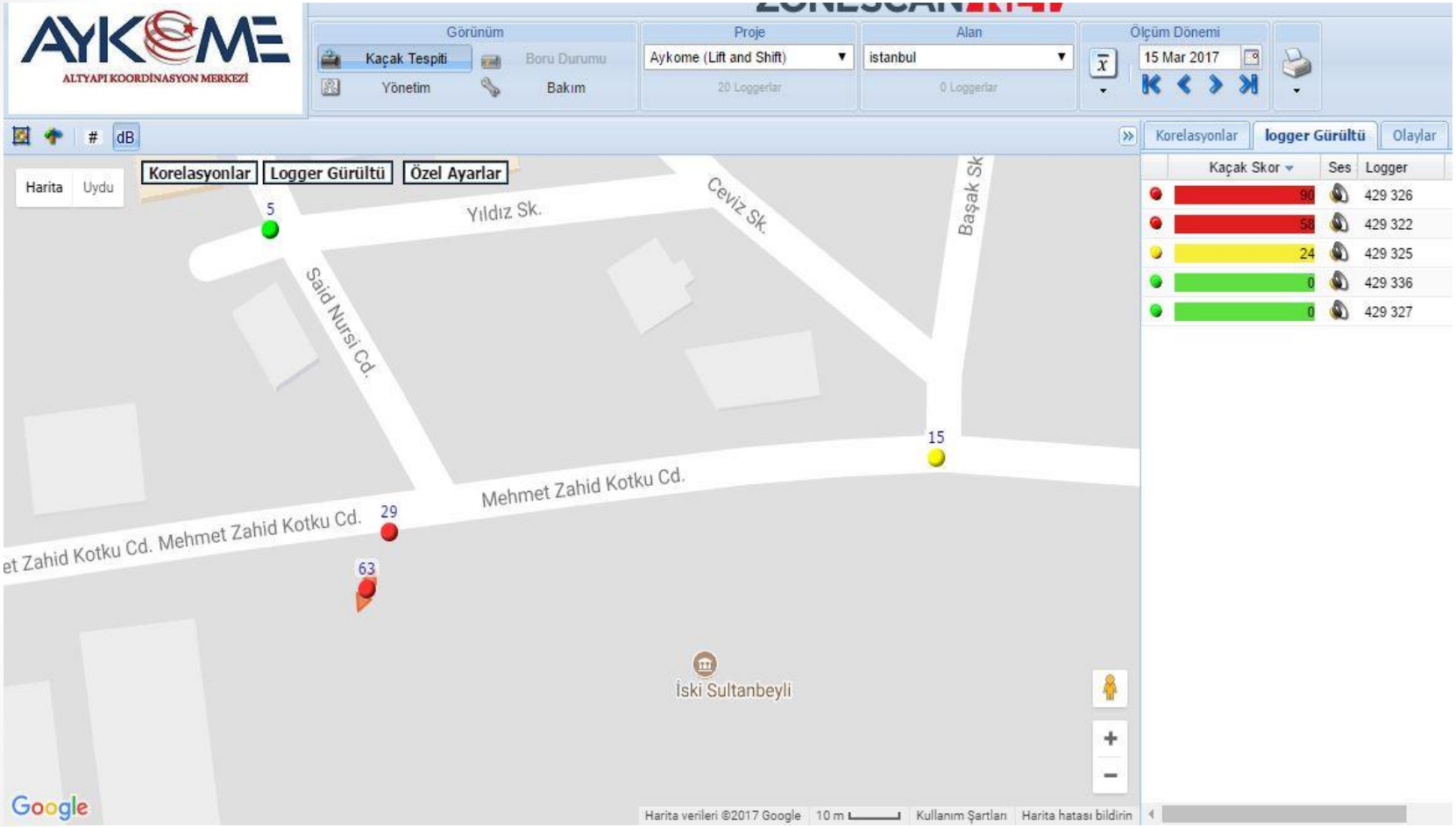
Case Study of ZoneScan 820 (Istanbul)



An artificial leak detection has taken place by opening hydrant valve.

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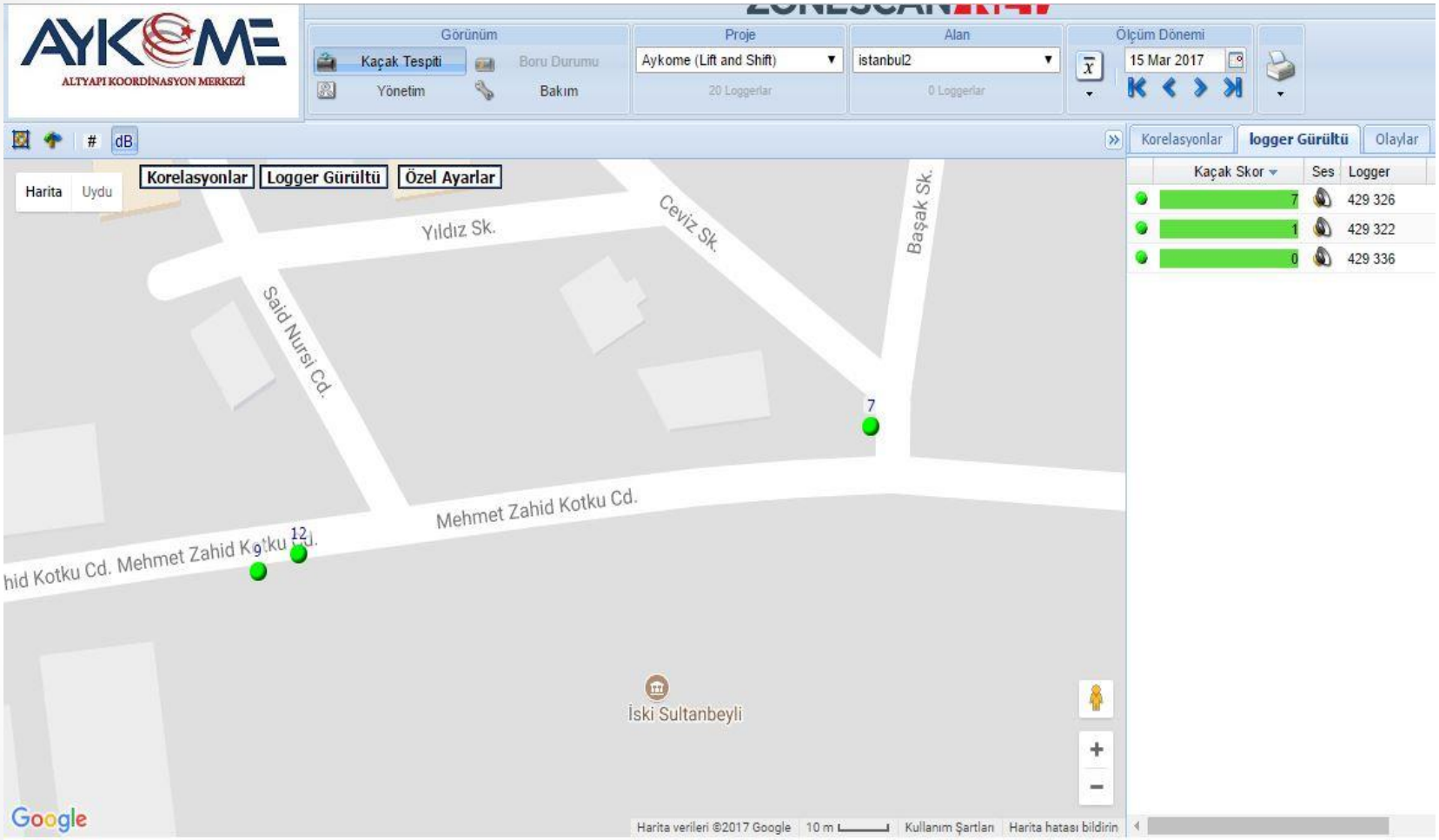
Case Study of ZoneScan 820 (Istanbul)



Hydrant valve has been closed and changes observed.

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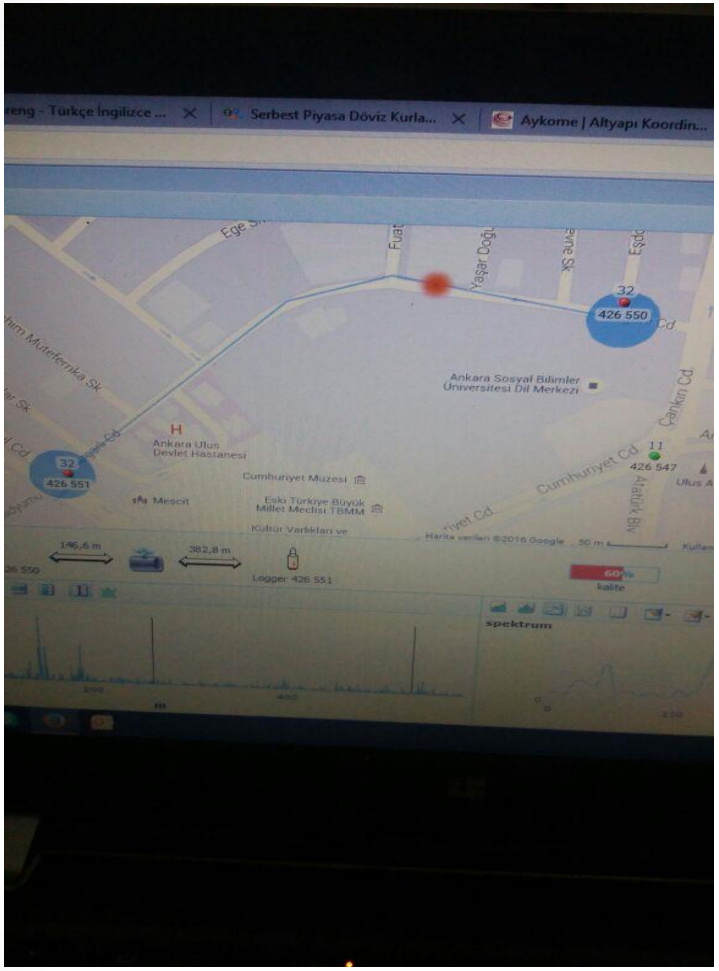
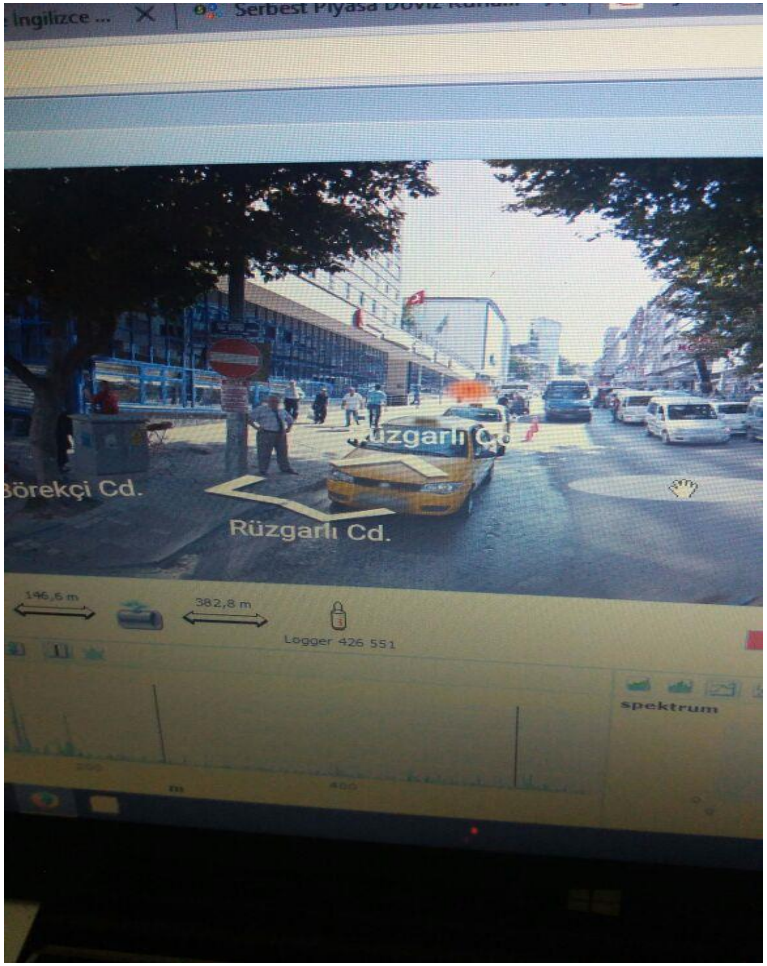
Case Study of ZoneScan 820 (Ankara)





Leakage point detection at 500m in Ulus, Ruzgarli Street.

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Case Study of ZoneScan 820 (Ankara)

According to people who live in the area, It is said to be a continuing defection for about 5 years.

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Success Stories and References in the World

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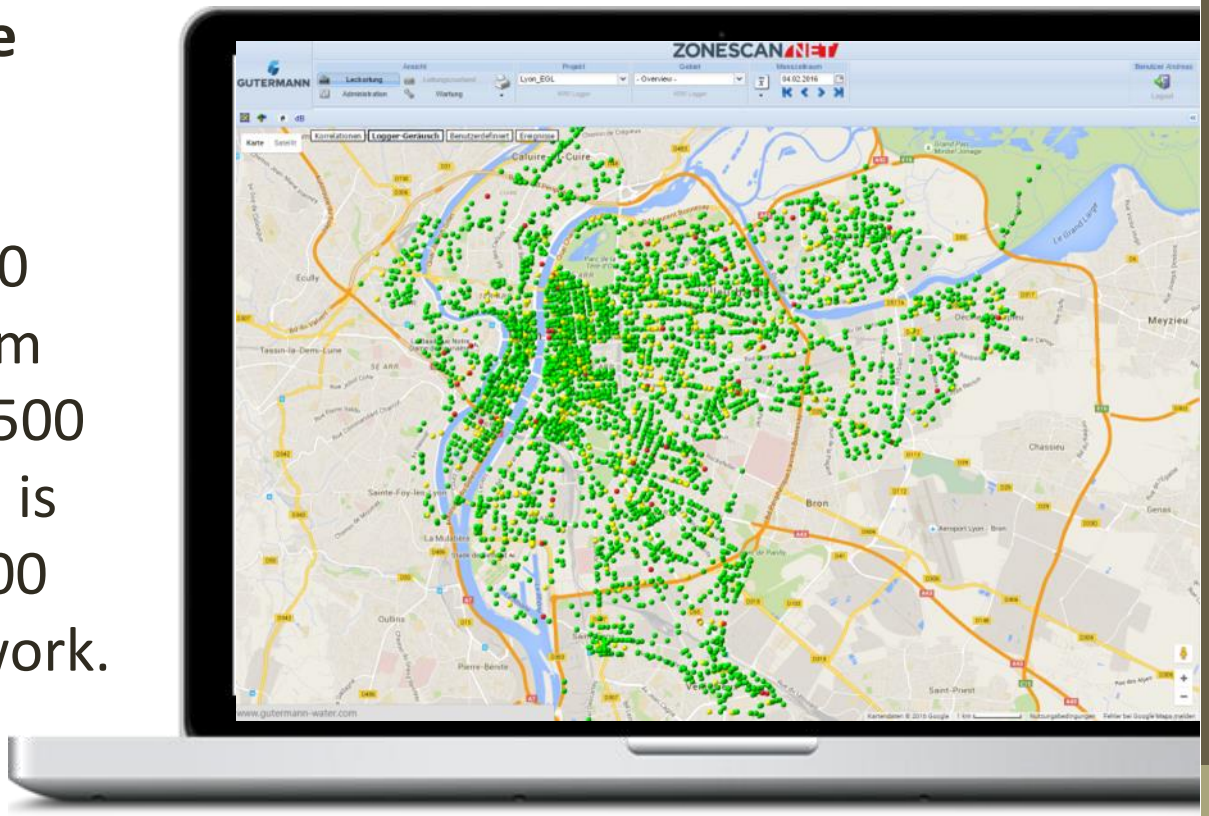
Zonescan Alpha in the World

- The biggest user in Europe is **France Lyon.**

- Number of 5.500 stationary system and number of 500 portable system is installed on 1.200 km of pipe network.



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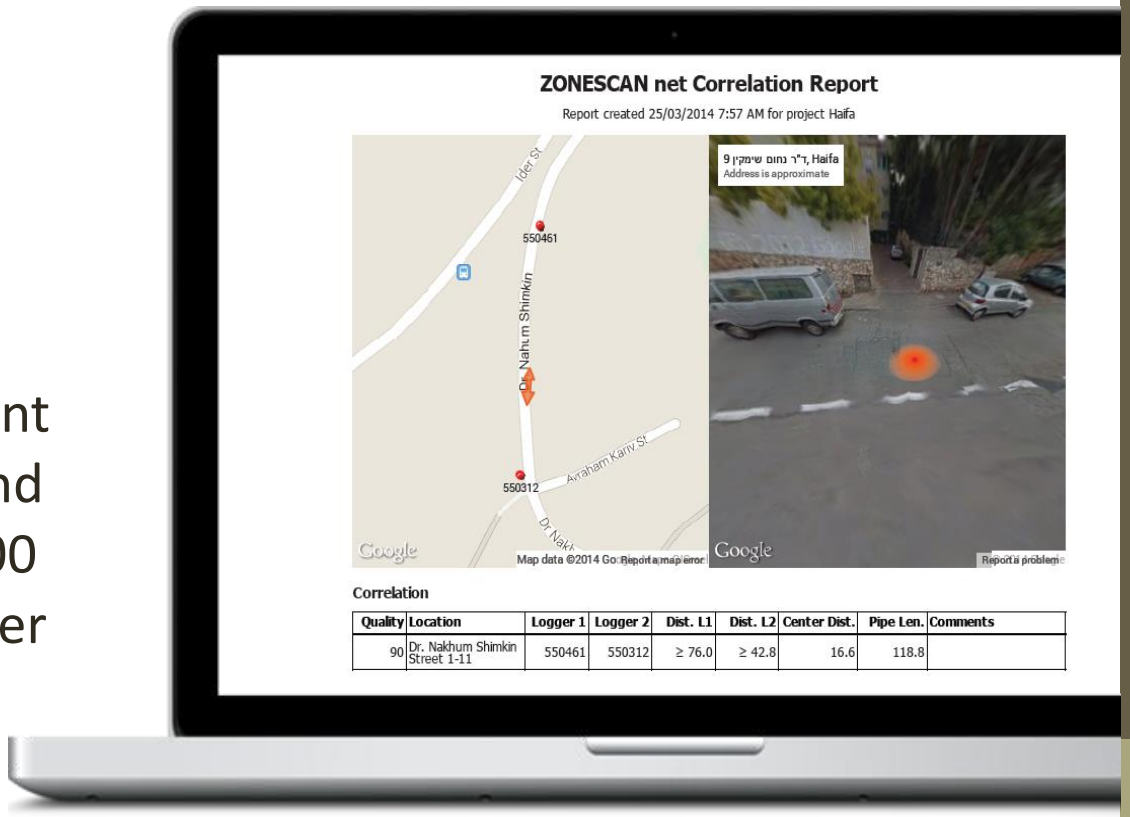
Zonescan Alpha in the World

- Another example is from **Israel, Hayfa**.
- In here a number of 1.090 stationary system is installed.
- Over 100 leakage point has been detected and repaired, 1 million 900 thousand liter of water has been reserved in the period of 15 months.



Quality	Location	Logger 1	Logger 2	Dist. L1	Dist. L2	Center Dist.	Pipe Len.	Comments
90	Dr. Nakhum Shimkin Street 1-11	550461	550312	≥ 76.0	≥ 42.8	16.6	118.8	

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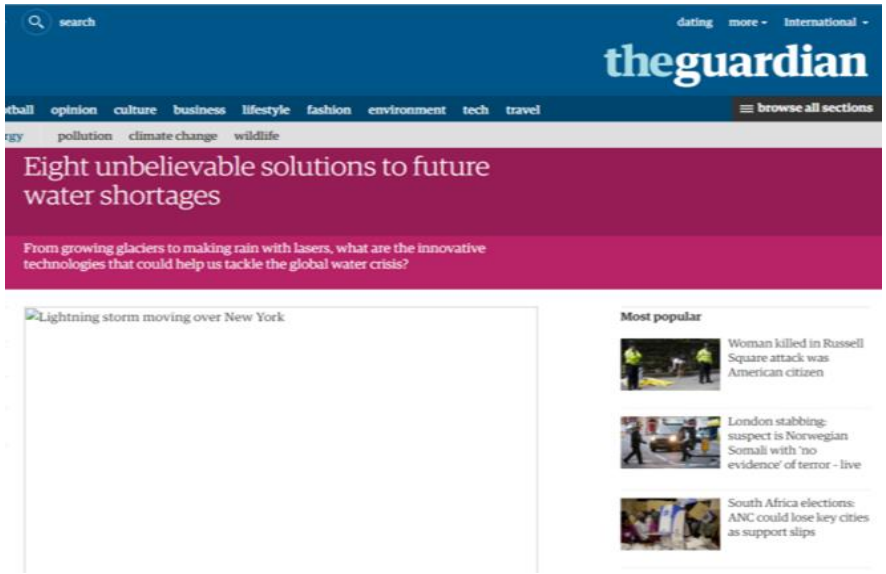
Zonescan Alpha in the World

- World's biggest case study is located in **Abu Dhabi** with the number of 10.000 stationary system.
- A number of 1.200 stationary system is installed in **Latin America** and **Peru**.
- In **Turkey,** at total 575 loggers has been installed. In **Denizli**, **Muğla, Afyon** and **İstanbul** system is portable and in **Antalya** it is stationary.

Why Zonescan Alpha?

- Access to all the data in the server when requested and provides daily correlation information.
- The only device doing correlation between green points.
- The only device doing full correlation.
- Remote detection of leakages automatically.
- All possibilities are to be evaluated for commited graphics and analysises.
- Preventing infrastructure demages and all the leakages even if they are small.



7. Leak monitoring

Despite all the water wasted inside the home - dripping taps, inefficient toilets and showers - utility companies acknowledge that as much as a third is lost to leaks before it even arrives. Tackling this problem is Zonescan Alpha, a software that pinpoints leaks and relays data back to a control centre. It works by embedding sensors throughout a network and has been successfully trialled by Albstadtwerke, a German utility company, which says it helped reduce waste by 2m litres.

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Zonescan Alpha with Awards

'Best product' - Software applications and services, H2O Accadueo, Bologna (2014)

Environmental technology awards, Ministry of Environment UN, Stuttgart (2013)

"Technology Innovation" - WEX Global, Madrid (2013)

'Best Water Leak Detection Product', H2O Water Awards - Dubai (2012)

10 Outstanding technology - ACE'12, Dallas, (2012)

Technology Awards - AQUA, Trencin, Slovakia (2012)

'Finalist "Water" – The Guardian Sürdürülebilir Commercial Awards, London/UK, May 2012

THANK YOU FOR YOUR VALUABLE TIME

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YUPAM ICUWT Kongresi (Yer Altı Yer Üstü Ulaşım Planlama ve Araştırma Merkezi Kurulması)

International Congress on Underground Infrastructure, Water Management and Trenchless Technology

7-8 September 2017

İstanbul Medeniyet University

YUPAM (Yer Altı Yer Üstü Ulaşım Planlama Araştırma Merkezi Kurulması Projesi) İSTKA 2016 Yenilikçi ve Yaratıcı Mali Destek Programı tarafından hibelenmiştir. YUPAM Projesi İSTKA 2016 Yenilikçi ve Yaratıcı Mali Destek Programı tarafından hibelenmiştir. ICUWT- Yer Altı Alt Yapı, Su Yönetimi ve Kazısız Teknolojiler Uluslararası Kongresi (International Congress on Underground Infrastructure Water Management and Trenchless Technology) YUPAM projesi kapsamında İstanbul Medeniyet Üniversitesi'nde 7-8 Eylül 2017'de düzenlenmiştir.