ADB

ASIA WATER FORUM 2018

INFORMATION, INNOVATION, AND TECHNOLOGY

2–5 October • ADB HQ, Manila, Philippines

Cases study in India

for

NON REVENUE WATER

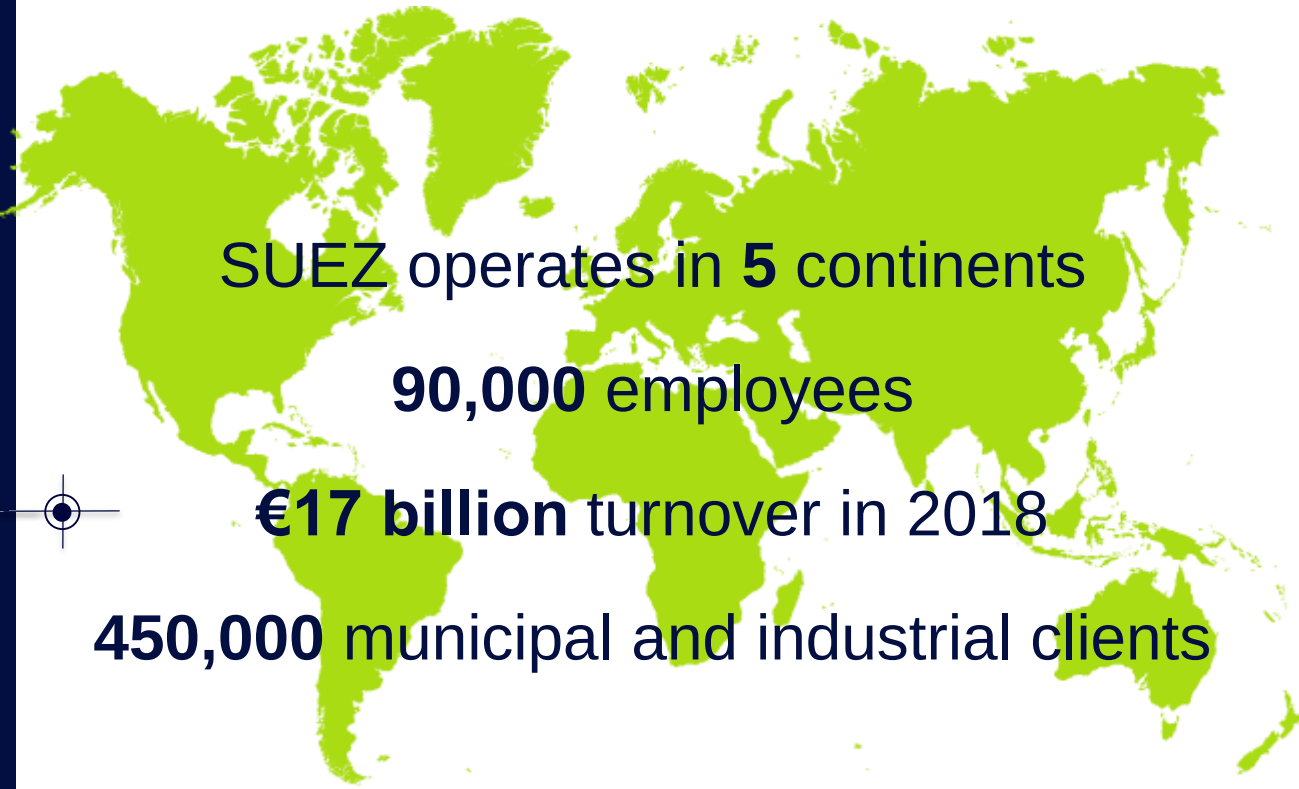
Jean-Marc LOTTHE

SUEZ India

SUEZ

at a glance

A presence throughout the world



SUEZ operates in **5** continents

90,000 employees

€17 billion turnover in 2018

450,000 municipal and industrial clients

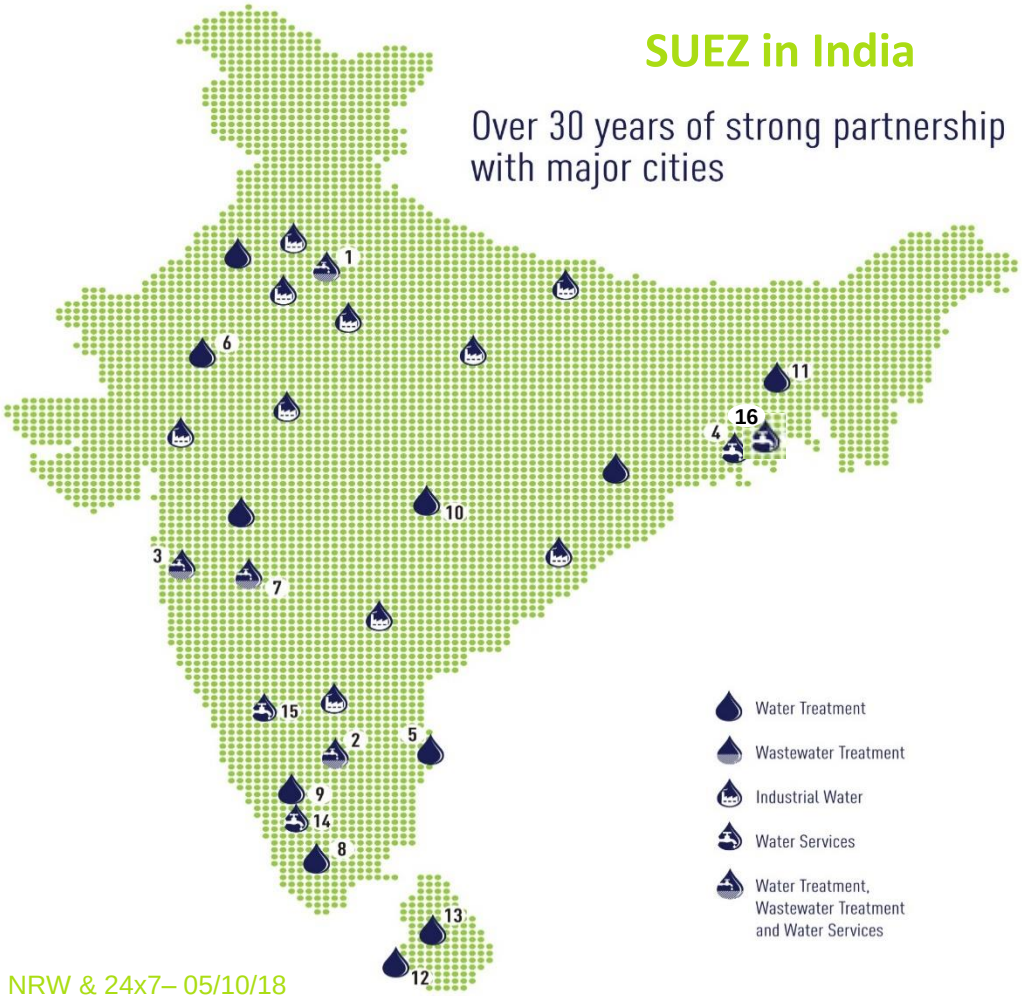
SUEZ at a glance

A world leader in the smart and sustainable management of resources

drinking water produced (worldwide) **5.3 billion cubic meters**	drinking water distributed (worldwide) **3,162 million cubic meters**	waste water recycled (worldwide) **882 million cubic meters**	wastewater depolluted (worldwide) **92%**
people benefiting from waste collection services **34 million people**	waste treated **41 million tonnes**	hazardous waste treated **2.9 million tonnes**	recovered material from sorting centers **10.4 million tonnes**

SUEZ in India

Over 30 years of strong partnership with major cities



1. Delhi, New Delhi
   - 717 MLD WTP
   - 400MLD STP
   - Malviya Nagar Water Services project for 40,000 connections
2. Bangalore, Karnataka
   - 1550MLD WTP
   - 175MLD STP
   - Leak Detection for 1,750 km distribution network
   - D1A Project: Water Loss Reduction Contract
3. Mumbai, Maharashtra
   - 3355MLD WTP
   - 37MLD STP
   - Water Distribution Improvement Program for 15 million people
4. Kolkata, West Bengal
   - Water Loss Management Contract for 25,000 connections
5. Chennai, Tamil Nadu
   - 530 MLD WTP
6. Bisalpur, Rajasthan
   - 400 MLD WTP
7. Pune, Maharashtra
   - 500 MLD WTP
   - 77 MLD STP
   - 24/7 Water Supply Project in Pimpri, Chinchwad
8. Trivendrum, Kerala
   - 74 MLD WTP
9. Kozhikode, Kerala
   - 174 MLD WTP
10. Nagpur, Maharashtra
    - 120 MLD WTP
11. Saidabad, Bangladesh
    - 450 MLD WTP
12. Kelani, Sri Lanka
    - 180 MLD WTP
13. Kandy, Sri Lanka
    - 46 MLD WTP
14. Coimbatore, Tamil Nadu
    - 24/7 Water Supply Project for 150,000 consumers
15. Davanagere, Karnataka
    - 24/7 Water Supply Project for 92,000 properties
16. Kolkata, West Bengal
    - Water Loss Management Contract For 40,000 connections

3 Cases

Bangalore: D1A

- Non revenue Water Reduction

Bangalore

- Helium Leak detection

Malviya Nagar

- 24x7 conversion

Non Revenue Water reduction

Bangalore: D1A

Is India's Bangalore doomed to be the next Cape Town?

Project Outline

Name of Project : Improvement to Water Distribution System, Reduction in UFW & Leakage Control in Central Division (D1a)

Project Location : Central Division of BWSSB, Bangalore

Name of the Client : Bangalore Water Supply & Sewerage Board (BWSSB)

Project Financing : Japan International Co-operation Agency (JICA)

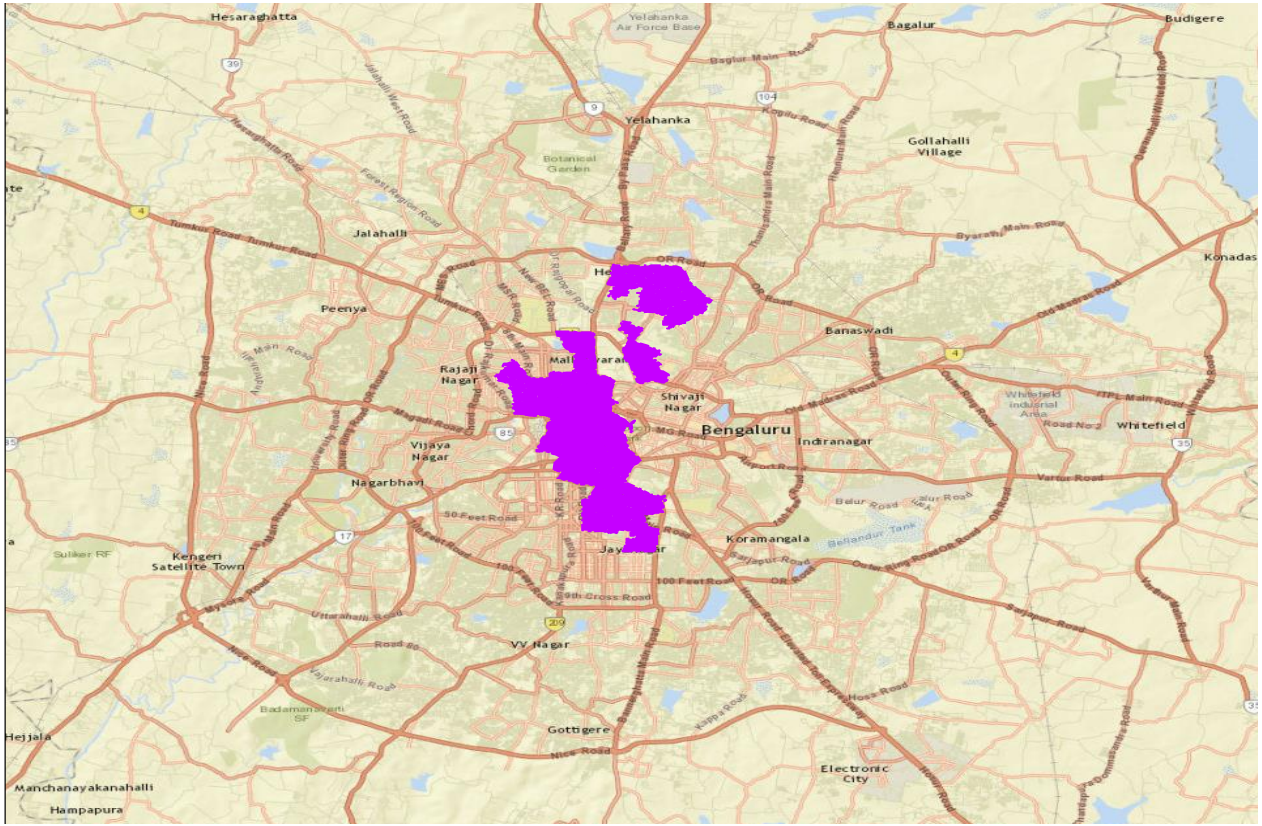
Project Period : 8 years (3 years construction + 5 years O&M)

Phase -1 : Design & Construction : 21-11-2013 to 20-11-2016. (E.O.T. received up to 31-05-2018)

: Phase -2 : Operation & Maintenance : 21-11-2016 to 20-11-2021.

Contract Model : Performance based Construction and Maintenance

Project Location



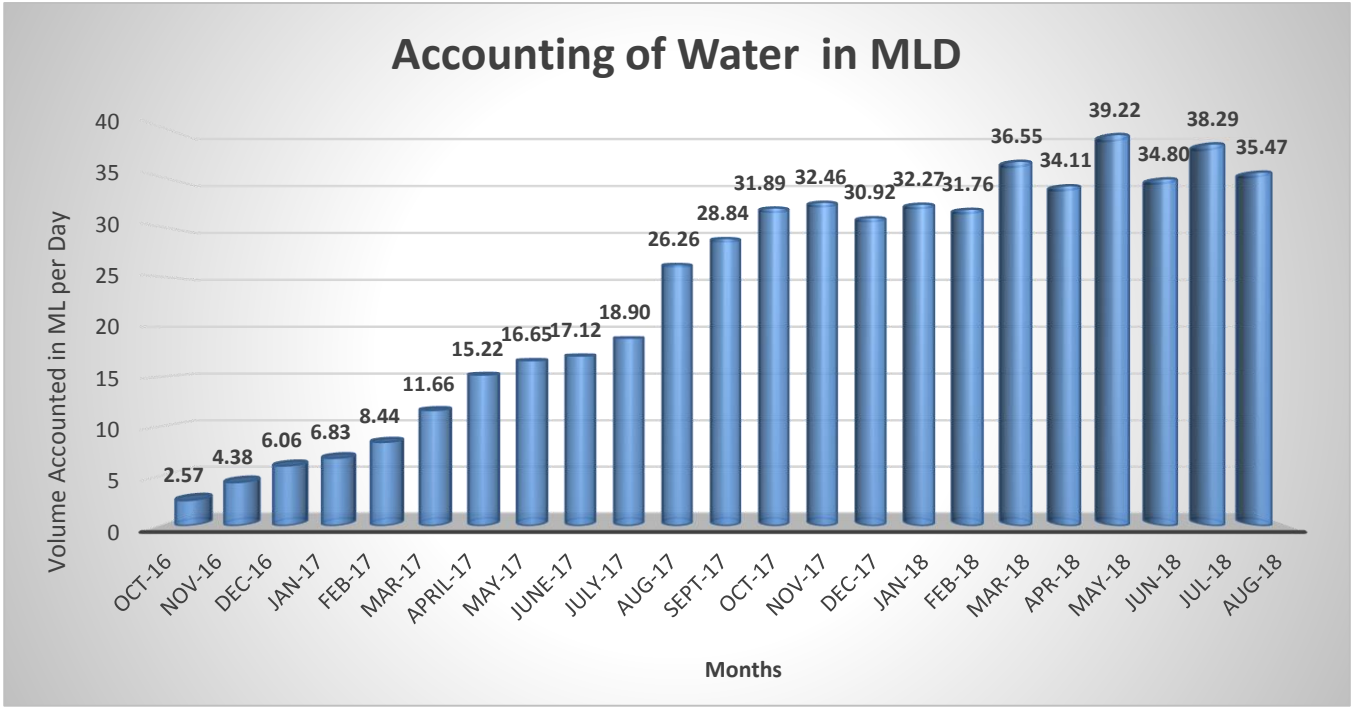
Main achievements

- UFW reduction from 52.06% to 27.14% i.e. 24.92% in August -18 for 43 DMAs under base UFW assessment.
- Total water Accounted is 35.47 MLD in August -2018.
- Parallel meter reading in all DMAs contributed revenue addition to BWSSB by accounting 135 ML of water.
- Cumulative 1293 Kms of Network length covered under helium leak detection. Total 6873 nos. Visible and 1695 nos. In-Visible leaks detected and 8563 nos. repaired.

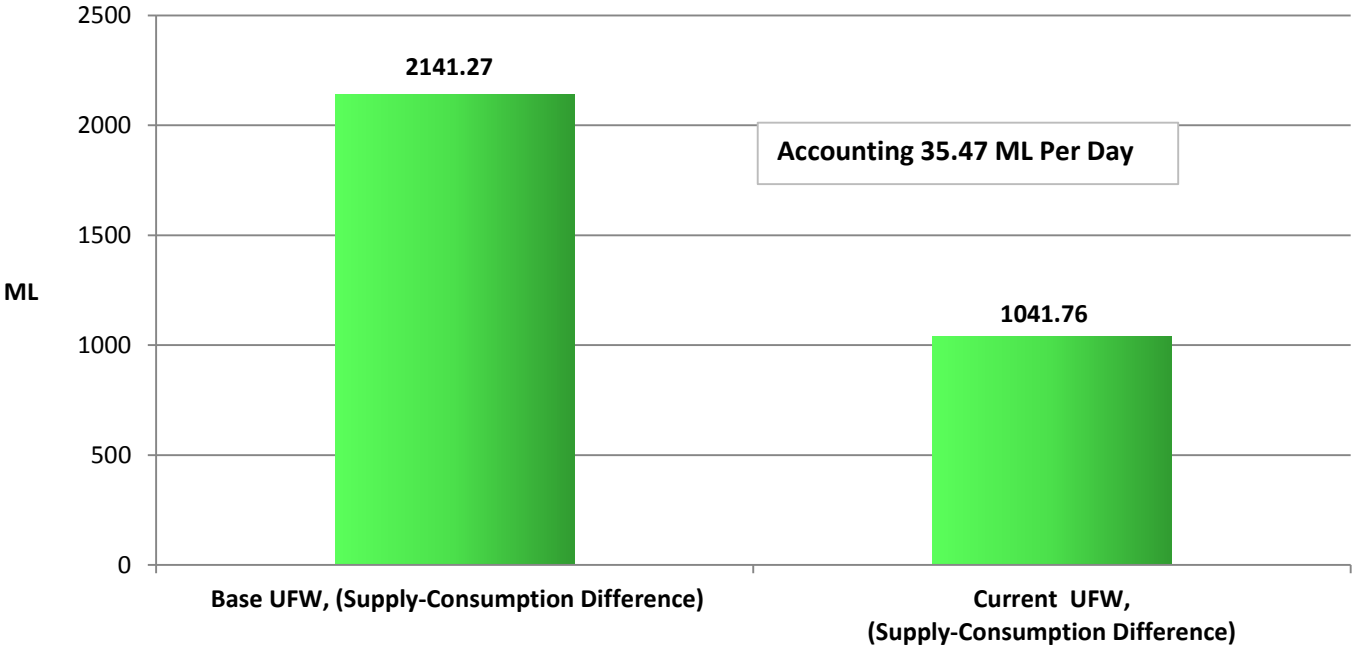
Non Revenue Water Reduction progress

- Avg. Initial UFW Level : 61.00 %
- Avg. Base UFW Level : 52.06 %
- Avg. Current UFW Level (July-18) : 27.14 %
- Present Volume of Water Accounted : 35.47 MLD

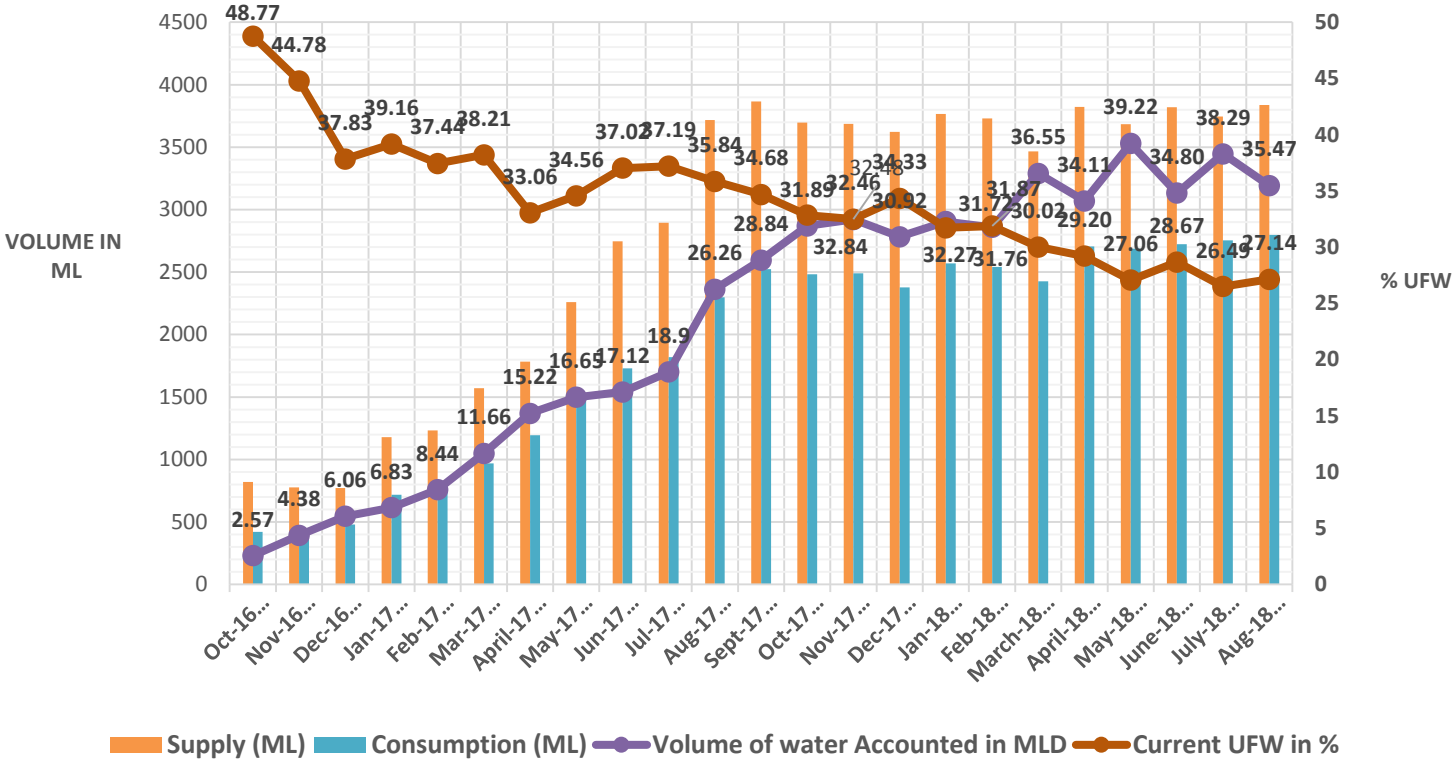
Accounted for water progress



Non revenue Water Reduction progress



Unaccounted For Water Progress



How: Design, construction and Commissioning of DMAs

District Meter Installation

District meter programming

HOW? NRW Reduction Action Plan

Visible Leaks		In-Visible Leaks (Helium Tech)	
Detected (No. of Locations)	Repaired (No. of Locations)	Detected (No. of Locations)	Repaired (No. of Locations)
6873	6870	1697	1695
Total Public Taps Metered	500	**Total Illegal Connections Reported**	3369
Total Bulk Consumers Identified and Reported	889	**Parallel meter reading conducted to find errors in meter reading**	100%
Vol of water accounted thro' replacement of CW meters		**18900 nos Result: Billing Vol increased by 44.10 ML / month**	

Helium Leak detection

Bangalore: HLD

Project Outline

Name of Project : **Work of Helium Gas Based Hidden Leak Detection Technology in Four which are not covered under current UFW projects**

Name of the Client : **Bangalore Water Supply & Sewerage Board (BWSSB)**

Contract Period : **23 Sept 2015 - 23 July 2016 (11 months)**

Scope:

1745 Kms. Of Leak Detection in 4 sub divisions NE-3, C-3, SE-1, E-1

3 cycles of Leak detection for 1745 Kms. for pipe sizes 100mm up to 450mm

Leak repairs to be attended for all type leaks for sizes 100mm up to 450mm

Methodology 1

STEP 1

Network Survey

STEP 2

Injection & Sampling

STEP 3

Pipe and Cable Tracing

Methodology 2

STEP 4

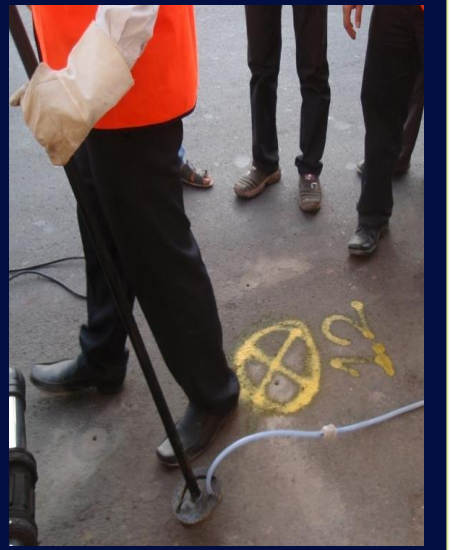
Drills for Detection

STEP 5

Leak Detection

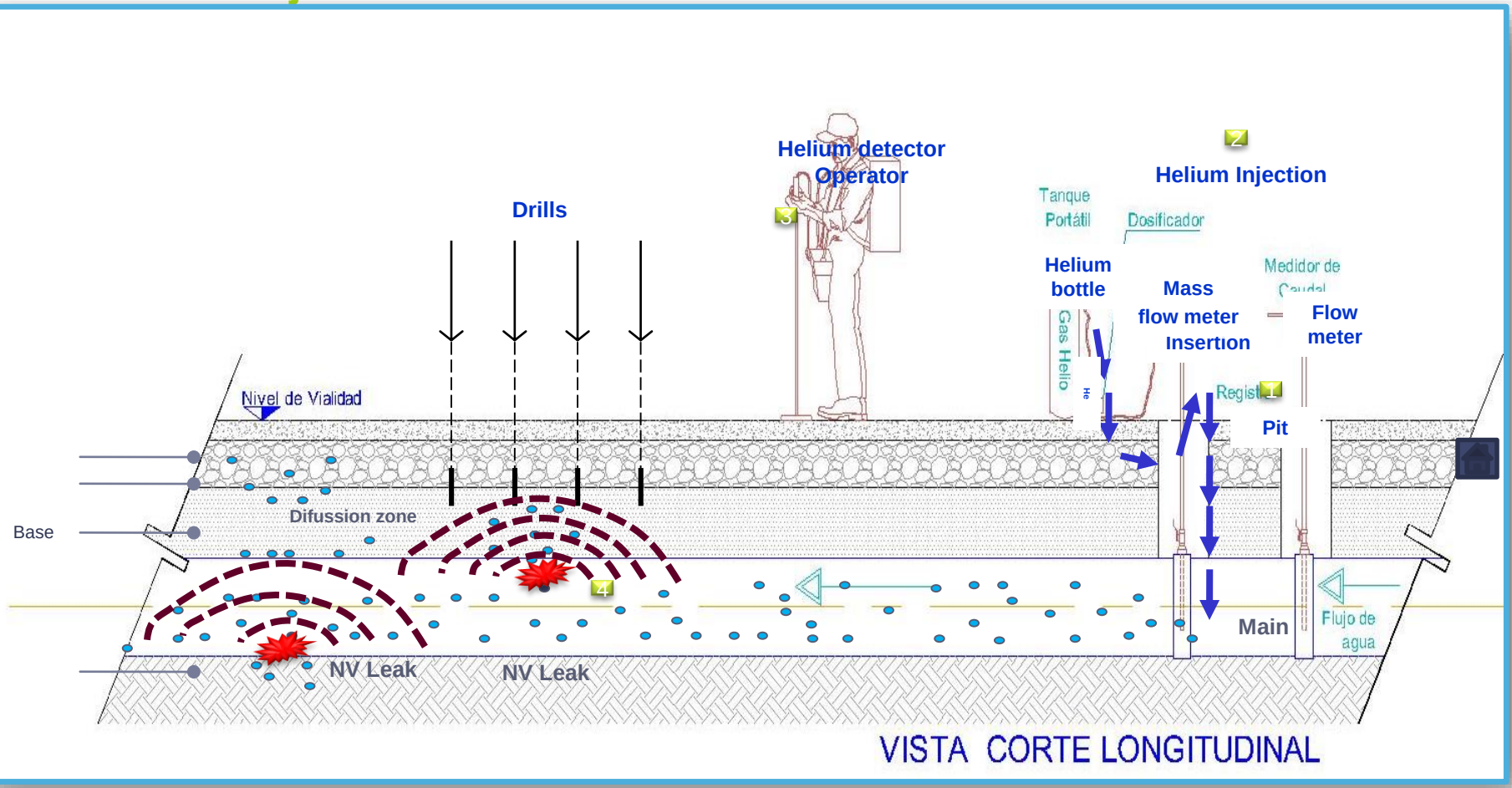
STEP 6

Leak Pin Pointing & Tagging with GIS

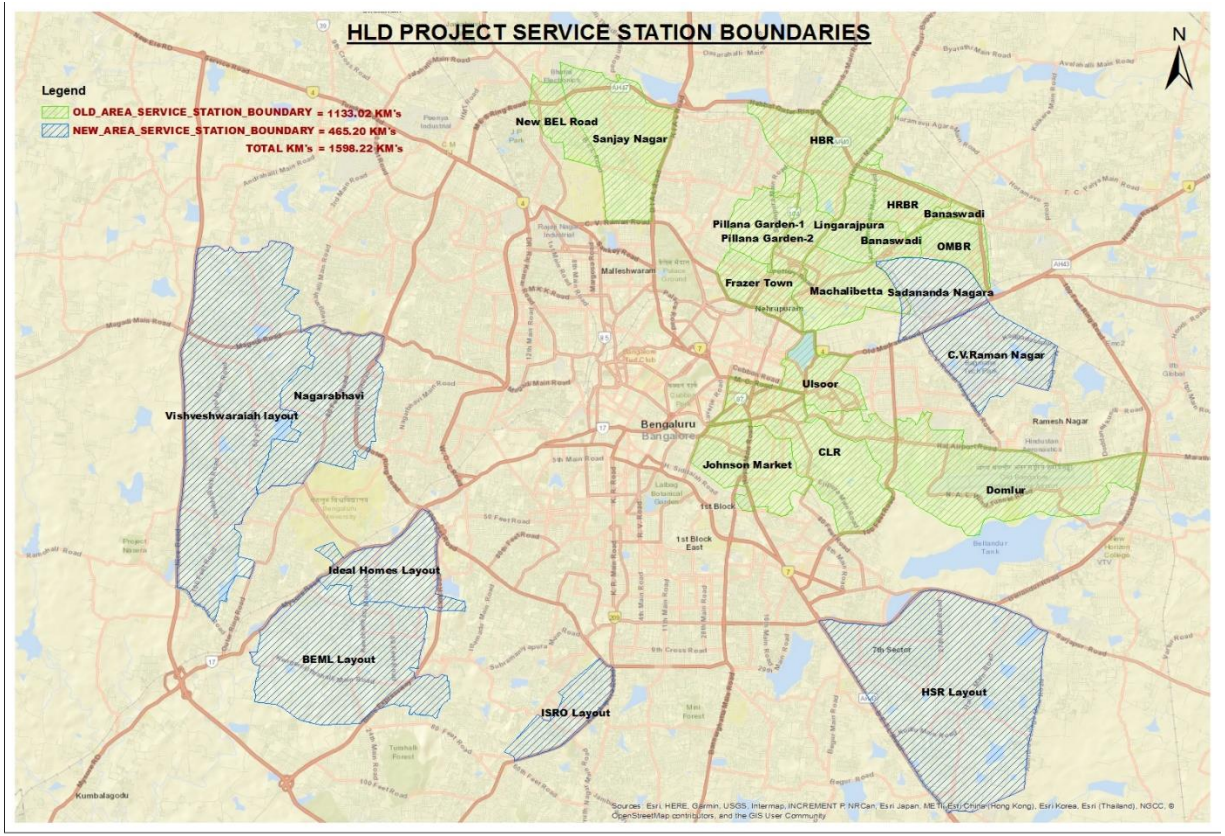


Leak Detection sequence

Helium Gas Injection Process



Service Area



Progress

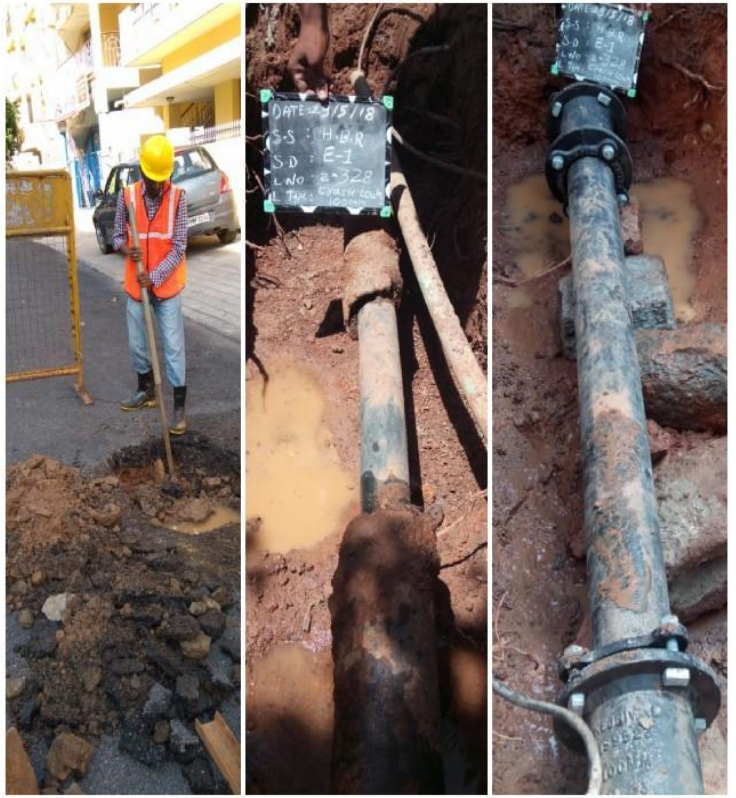
Comparison of overall 1st and 2nd Cycle Progress							
SL. No.	Network length 'Kms'	Leak detection completed 'Kms'	Leaks Identified 'Nos.'	Leaks rectification completed 'Nos.'	Leaks to be rectified 'Nos.'	Leaks Restored 'Nos.'	Leaks to be restored 'Nos.'
1st Cycle	1598.26	1598.26	2329	2329	0	2329	0
2nd Cycle	1598.26	1598.26	791	710	81	710	0
Total	**3196.52**	**3196.52**	**3120**	**3039**	**81**	**3039**	**0**

Repartition by leak type

SL.No	Leakage Type	Total
1	HSC Leakage	1463
2	Socket Joint Leakage	995
3	Tee Leakage	122
4	End Cap Leakage	52
5	Pipe Crack Leakage	306
6	Sluice Valve Spindle Leakage	103
		3041

PVC pipe connected to DI Pipe

Bend/Tee, PVC Leaks



Illegal connections

New compact machine developed in India to access narrow roads

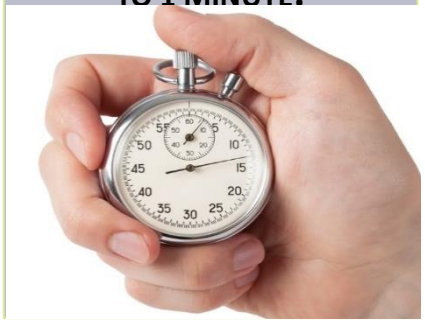
Leakage Volume calculation

STEP 1

EXCAVATION OF LEAK IDENTIFIED PIT

STEP 2

COLLECTION OF LEAKAGE QTY MEASUREING JAR UP TO 1 MINUTE.



STEP 3

CHECK HOW MUCH QUANTITY OF WATER COLLECTED IN THE JAR FOR 1 MINUTE.

THEN MULITIPLIED BY NO OF SUPPLY HOUR'S AND NO OF SUPPLY DAYS/MONTH TO GET OVERALL QUANTITY

Water savings

ABSTRACT							
Water Saving's Calculation by Using Volumetric Method in All Service Station by attending 3041. of Leak Repairs In 1st and 2nd cycle							
Sl No	LEAK Description	No of Leakage's Rectified	No. Leaks for which Physical measurement of leakage has been done	Average of Leakage in litre's / hour for the Physically measured Leaks	Projected Leakage qty of the total no of leaks in litres / hour	Projected Leakage Qty. of total No. of leaks in litres / Day (6 hrs/day/Supply)	Projected Leakage qty of total No of leaks per Month in litres / Month (15 supply days/ Month) Alternateday supply
1	No RR number / Meter i.e. (Illigal Connection Leakages)	47	47	100	4,700	28,200	4,23,000
2	Average Bill but Consuption More (20 mm dia with avg 5 no's of connection)	73	63	400	29,200	1,75,200	26,28,000
3	Contamination Leaks (Joint/Borepoint leaks)	255	81	90	22,950	1,37,700	20,65,500
4	HSC Dummy Leakages (Disconected Borepoints)	995	215	88	87,560	5,25,360	78,80,400
5	Other Leakages(Joint leak/T leak/Valve leak/HSC)	1584	714	138	2,18,592	13,11,552	1,96,73,280
6	End Cap and Major Leakages	85	37	410	34,850	2,09,100	31,36,500
Total No of Leaks		3039	Total Leakage Qty. in Litre's / Month For 3041 no of Leaks				3,58,06,680
			Total Leakage Qty. in Million Litres (ML) / Month For 3041 no of Leaks				35.81

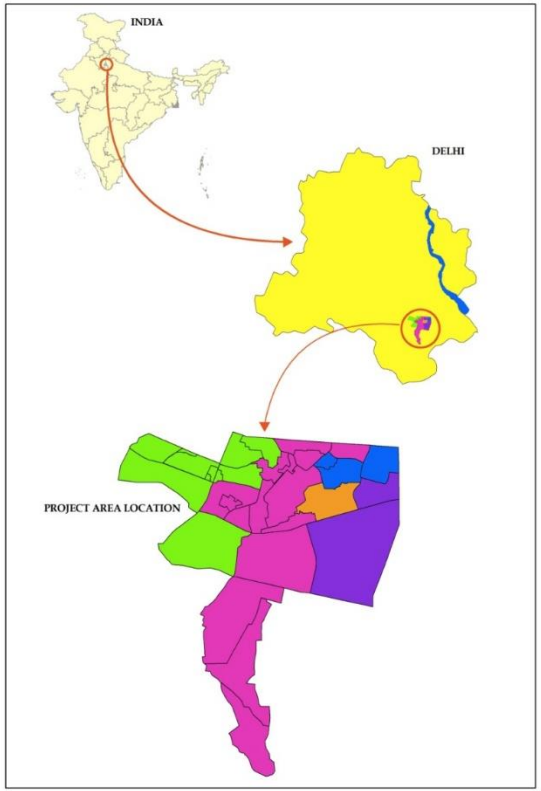
Advantages of the Helium Leak detection technology

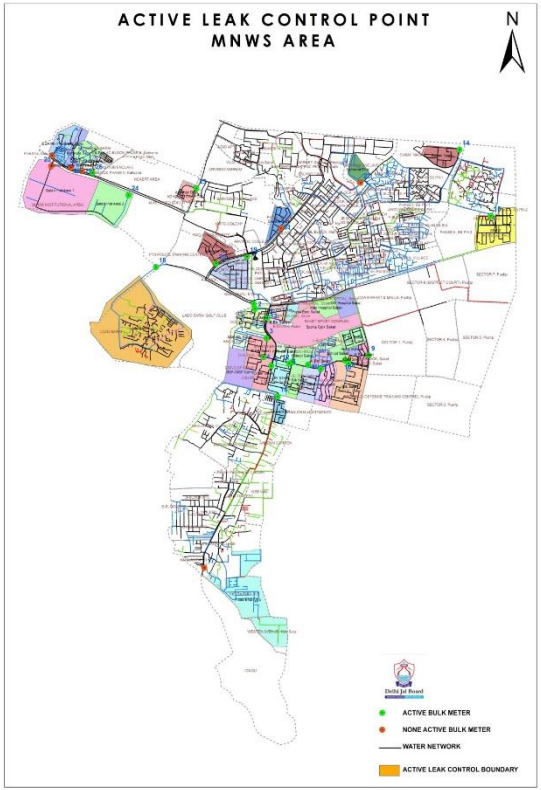
- Leaks can be detected in areas with low network pressure condition.
- Leak detection Process can be done during non-supply hours.
- Ideal for distribution system under intermittent water supply.
- Leaks can be detected in noisy and traffic areas.
- High accuracy in pin-pointing leaks.
- The above project has helped in strengthening of the existing water supply network, reduction in physical losses & also reduction in Unaccounted Water. Water accountability through sealing of leakages has improved revenue to BWSSB.

24x7 Conversion

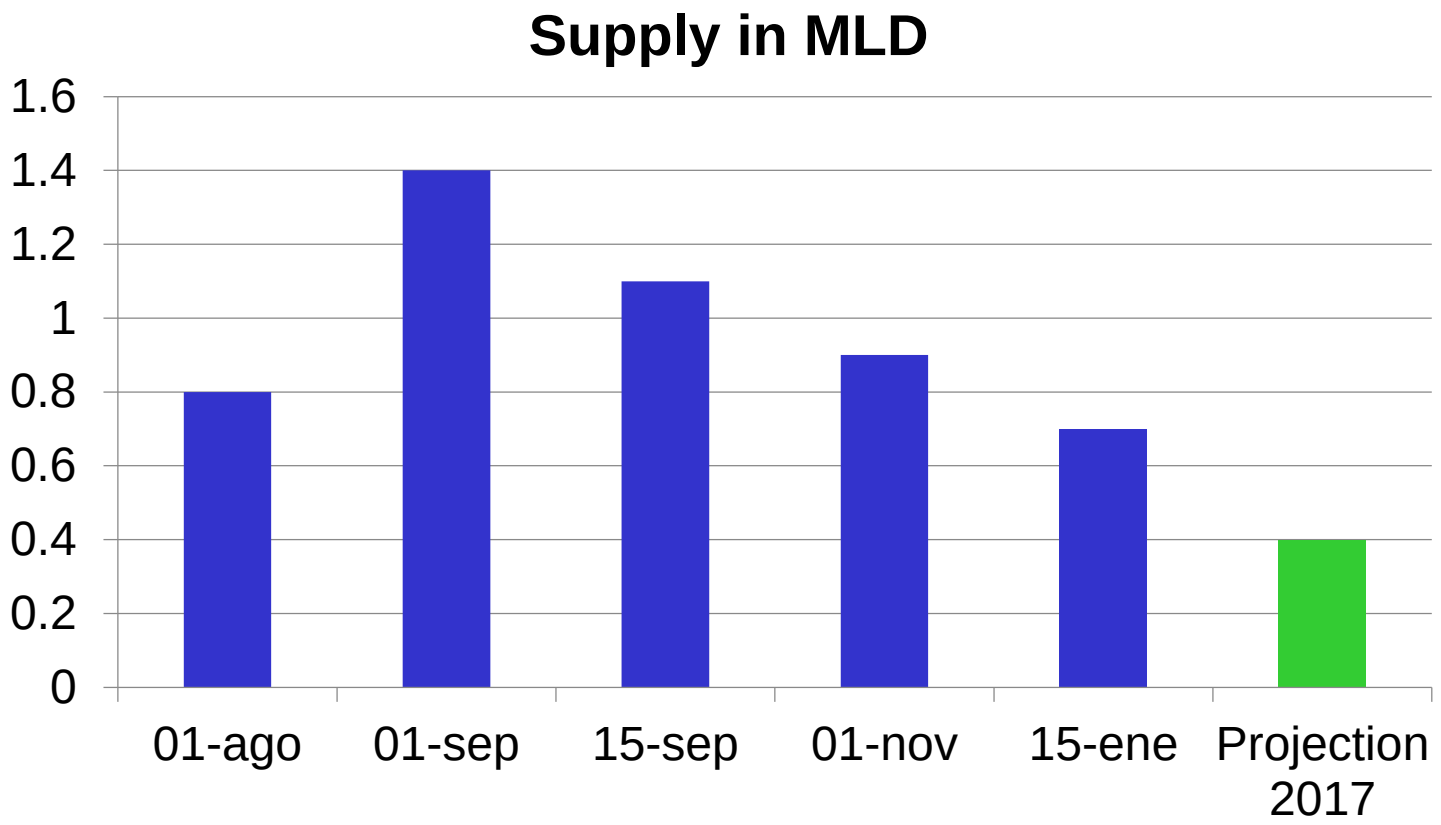
Delhi: Malviya Nagar

Project Area





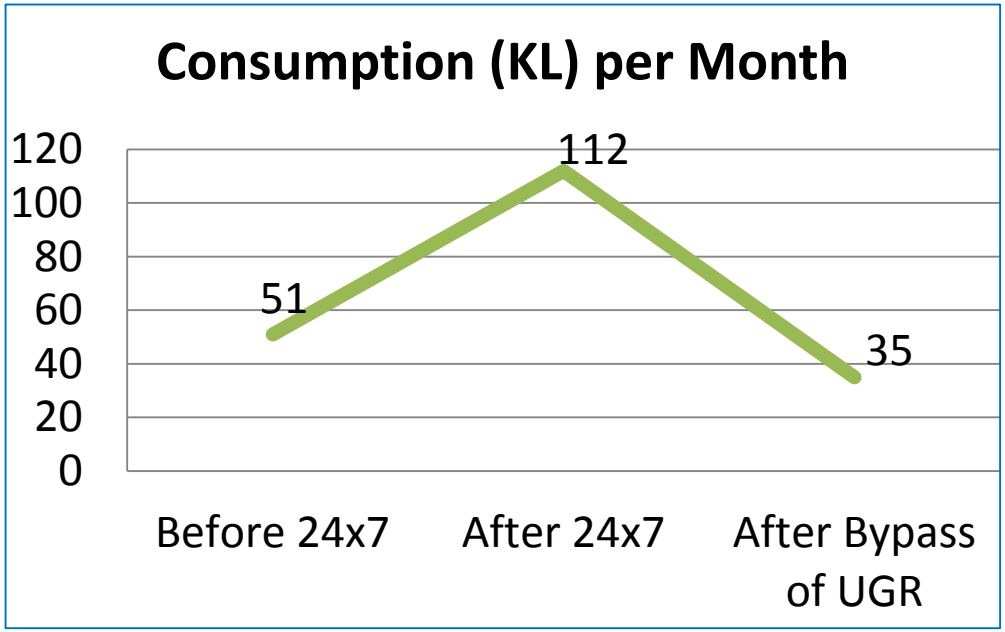
Geetanjali Colony



Internal leaks Control: By-pass of underground tank

Internal Leak control: Bypass of Overhead Tank

Bypass of Private Underground tank : Impact



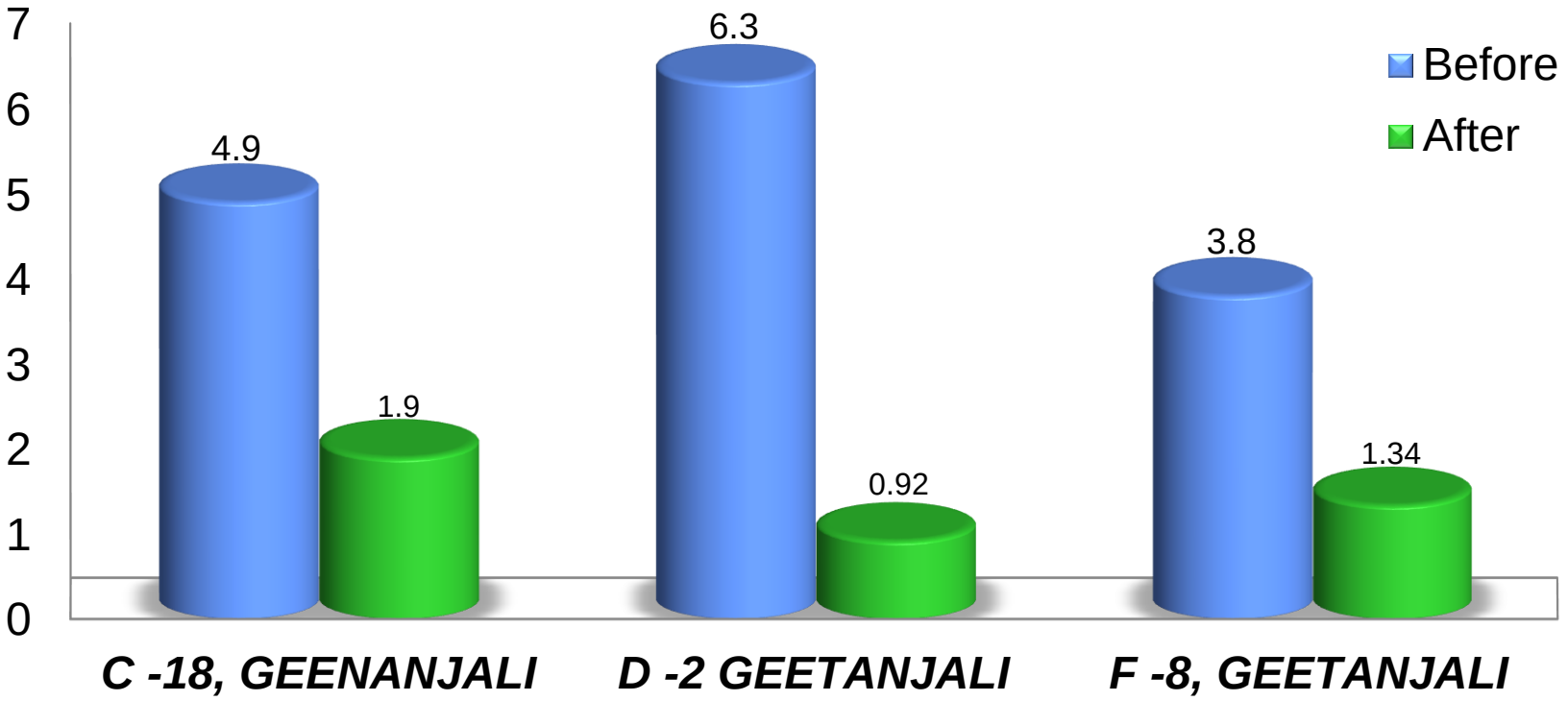
Monetary Savings

Water bill: 4400/- PM
Elecrit bill: 600/- PM

Total Savings: Rs. 5000/-PM
Yearly Savings: Rs. 60K

We Analyze the case of high consumption of F-8 Geetanjali and found that there was major leakage in under ground Tank. Post bypassing the UGR the consumption drop down to approx 70% in 24x7 supply.

Bypass of Private Underground tank : Impact



An Efficient Public Relations Action Plan is critical

Main lessons learned

Water losses reduction and Conversion to 24x7 supply are mainly resulting from O&M activities:

- ❑ Metering
- ❑ Meter reading
- ❑ Leak detection and repair
- ❑ Customer Communication
- ❑ Fraud detection

A huge Capital Expenditure program may be requested (but not always) and is never sufficient. **In too many projects Capex works are overestimated and O&M costs underestimated.**


THANK YOU