



WATER & WASTE WATER MANAGEMENT & AUDITS - CASE STUDIES

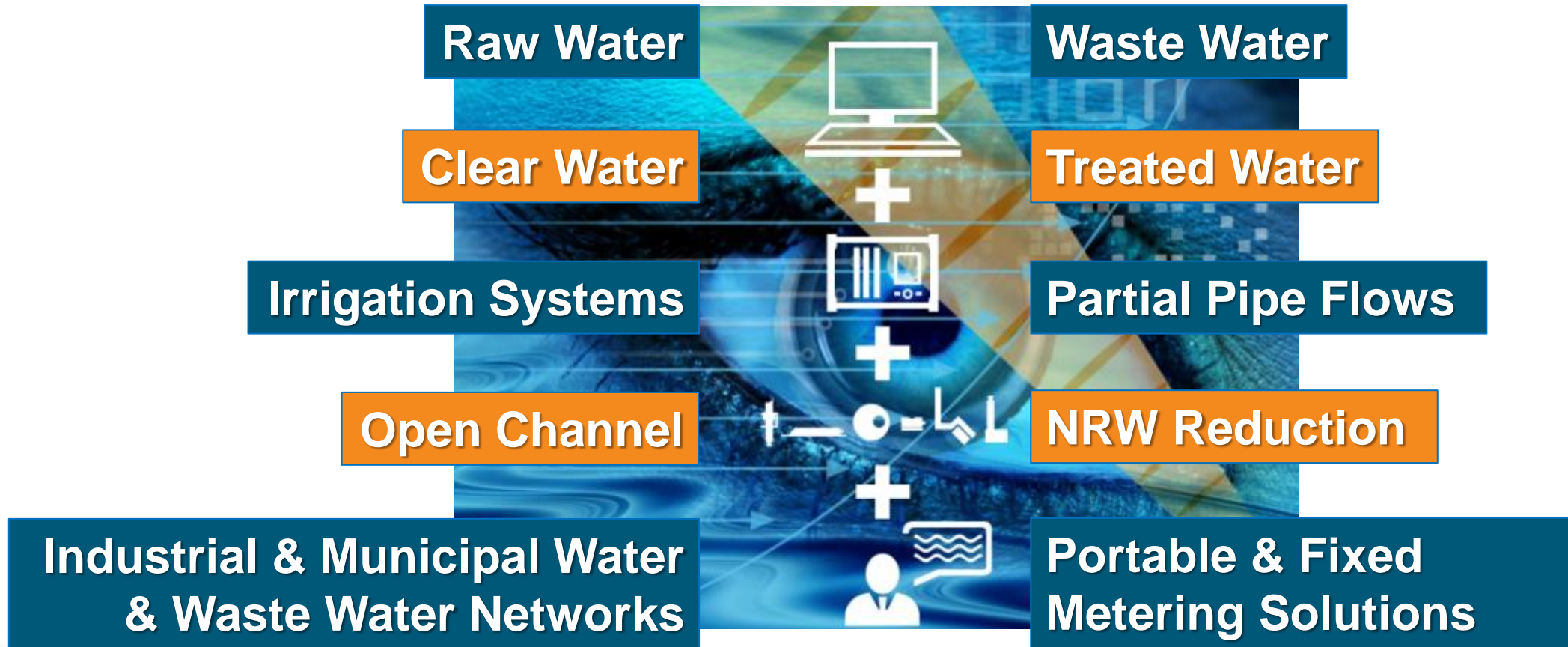
AUTOMATION AND MAINTENANCE MANAGEMENT SYSTEMS

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We measure **WATER !!**



“Measure Better to Manage Better”

CONTENT

TECHNOLOGY WE PROVIDE

CASE STUDIES

1

**WATER MANAGEMENT & AUDITS FOR
MUNICIPALITIES & TOWNSHIPS**

2

**INDUSTRIAL WATER
MANAGEMENT & AUDITS**

3

**WASTE WATER
MANAGEMENT & AUDITS**

TECHNOLOGY WE PROVIDE

Sensor Technology



- 
Cross Correlation
- 
Doppler
- 
Radar
- 
Transit Time
- 
Level
- 
Analysis

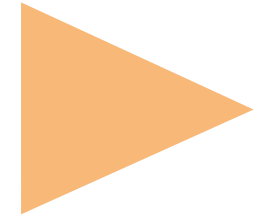
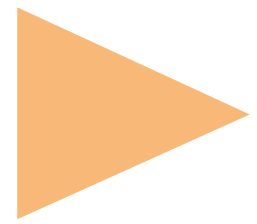
SCADA/Teleprocessing



Transmitter/RTU



Intelligent Data Transmission



WATER MANAGEMENT & AUDITS FOR MUNICIPALITIES & TOWNSHIPS

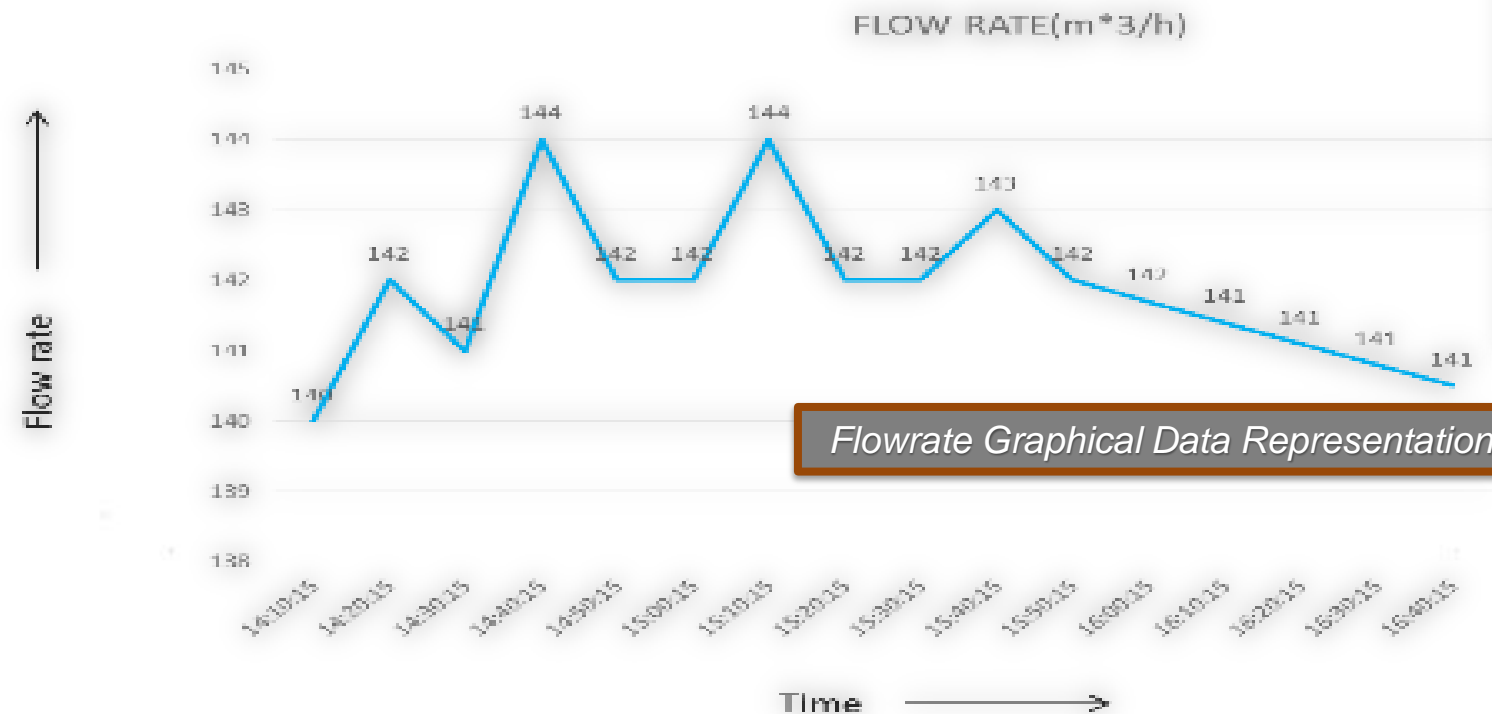
CASE STUDY 1 @ 27 AMRUT Cities, TN

PURPOSE

- Assessment (Flow & Pressure Measurement) of Water Supply Schemes (WSS) in 27 AMRUT (Atal Mission for Rejuvenation and Urban Transformation) cities in Tamil Nadu.
- Subcontract for Tamil-Nadu Water Investment Corporation (TWIC).

ACTIONS TAKEN

- The number of measurements, on an average of 10 per city were carried out.
- Flowrates and pressure were recorded and graphically represented.



Water Audit @ (AMRUT Cities), Chennai

RESULTS

- At all locations, Totalizer was recorded for 2.5 hours in m³ and the pressure in bar.

CASE STUDY 2 @ 10 DMA's, Chennai

PURPOSE

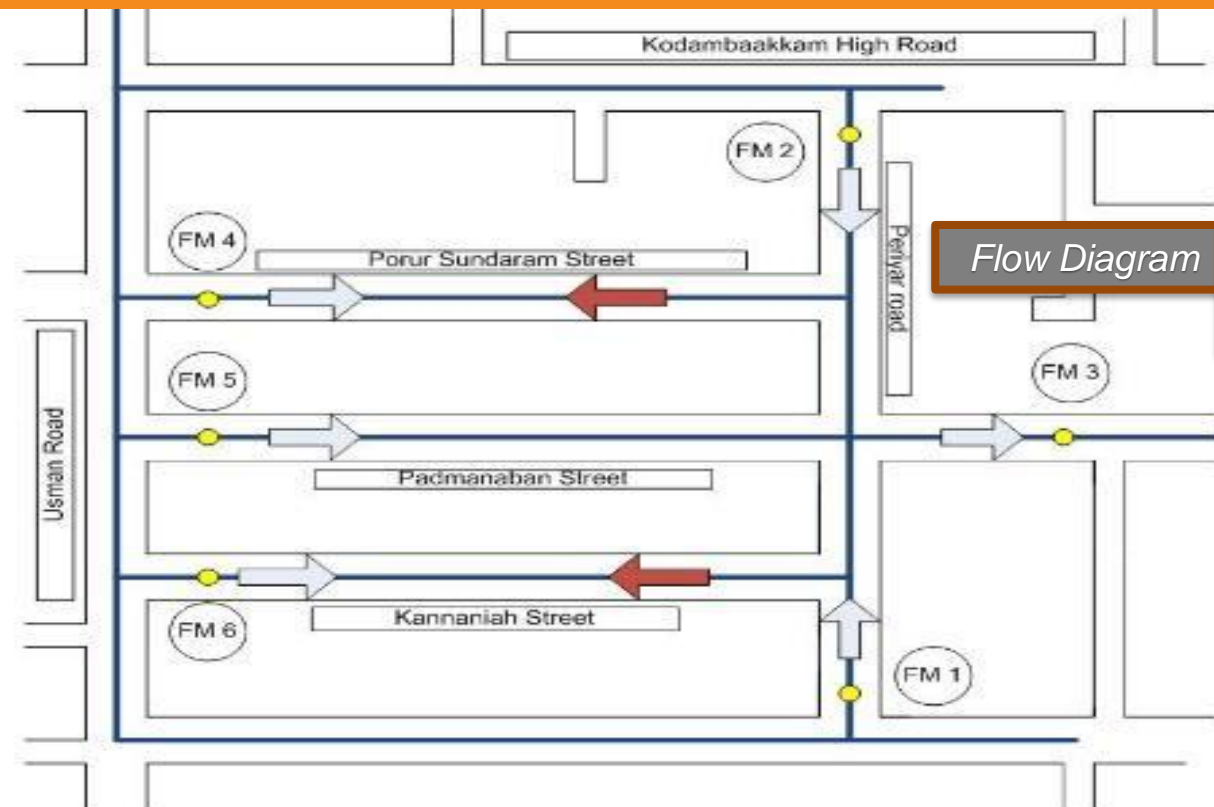
- Water Audit for 10 District Metering Areas (DMA's) in Chennai under Smart City Mission, Tamil-Nadu.
- Subcontract for Tamil-Nadu Water Investment Corporation (TWIC).

ACTIONS TAKEN

- Water audit for 24 hours at different locations in one DMA.
- Flowrates, pressure, negative totalizer and positive totalizer were tabulated.



Water Audit @ Chennai City under Smart City Mission



RESULTS

FM1 Flowrate: m ³ /h Pressure: bar Positive Totalizer: m ³	FM2 Flowrate: m ³ /h Pressure: bar Positive Totalizer: m ³	FM3 Flowrate: m ³ /h Pressure: bar Positive Totalizer: m ³
FM4 Flowrate: m ³ /h Pressure: bar Positive Totalizer: m ³ Negative Totalizer: m³	FM5 Flowrate: m ³ /h Pressure: bar Positive Totalizer: m ³	FM4 Flowrate: m ³ /h Pressure: bar Positive Totalizer: m ³ Negative Totalizer: m³

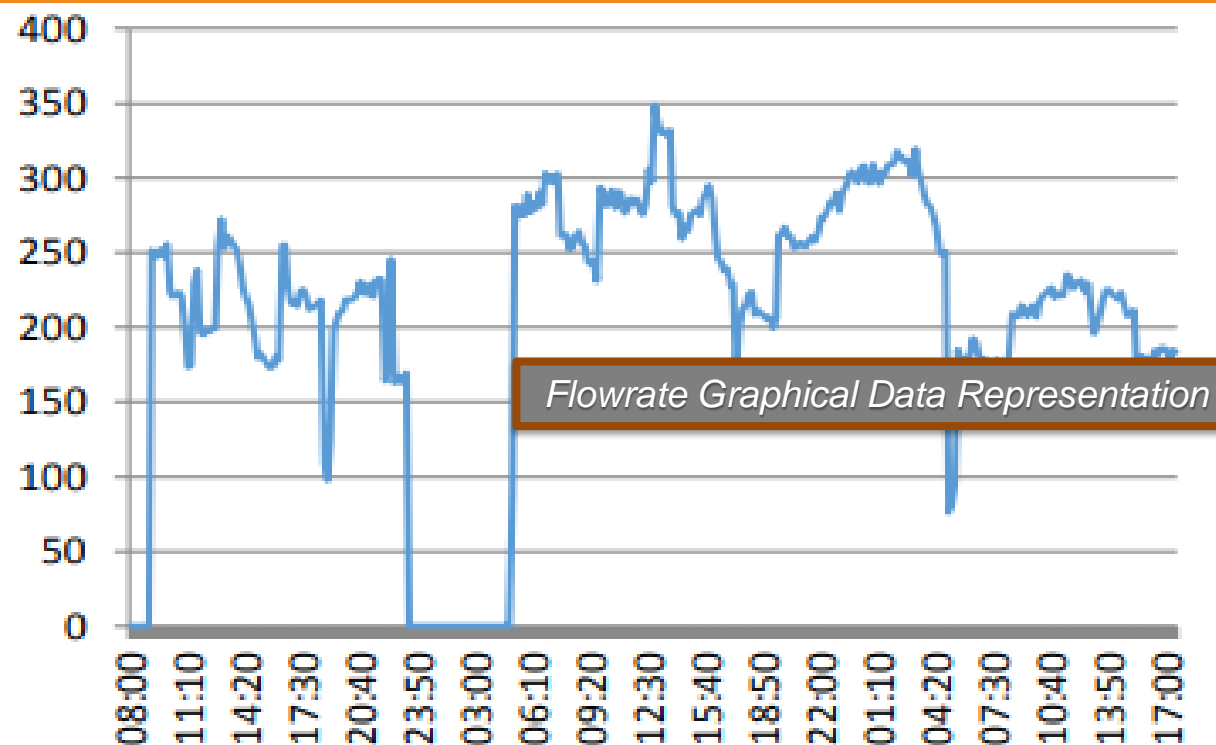
CASE STUDY 3 @ RS Puram, Coimbatore

PURPOSE

- Flow Measurement and Pressure Measurement services in RS Puram area of Coimbatore City, Tamil-Nadu.
- Subcontract for Suez Projects Pvt Ltd, Coimbatore.

ACTIONS TAKEN

- Carried out flow and pressure measurement at 11 locations each for a duration varying between 24 hours and 72 hours.
- Flowrates and flow velocities were tabulated and graphically represented.



Flow & Pressure measurement @ RS Puram, Coimbatore

RESULTS

- At all locations, Total Cumulative Flow in m^3 for a duration of 57 hours and the pressure at an instant in kg/cm^3 were recorded.

CASE STUDY 4 @ ARWSS, Kerala

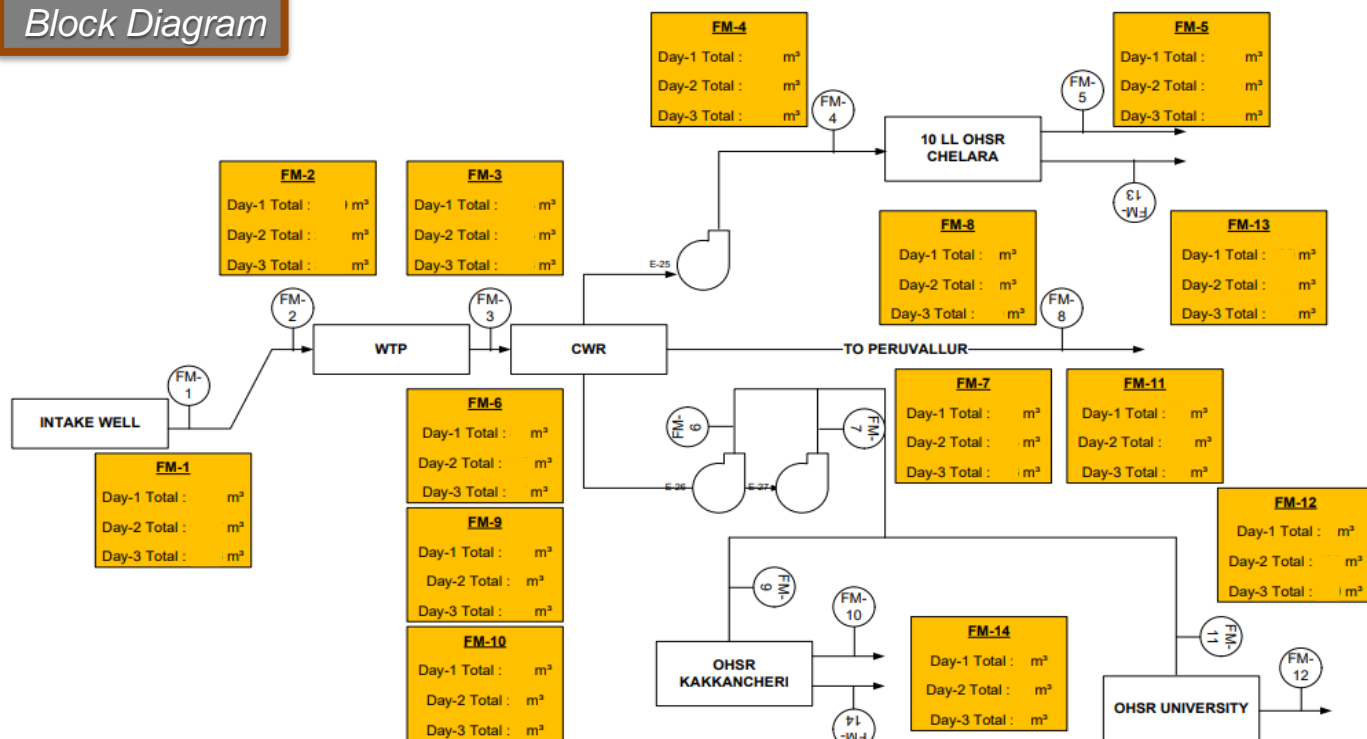
PURPOSE

- Flow Measurement services for Area-wide Rural Water Supply Services (ARWSS) at different locations within 10 districts of Kerala.
- Subcontract for KITCO Ltd, Cochin, Kerala.

ACTIONS TAKEN

- Carried out flow measurement at 14 locations each for a duration of 72 hours.
- Hourly flowrate and eight hourly total flowrate were tabulated.

Block Diagram



Flow measurement @ Pump outlet



Flow measurement @ OHT common outlet

RESULTS

- At all locations, the hourly, eight hourly total and 24 hours total in m³ were recorded.

CASE STUDY 5 @ Hubballi & Kalaburagi, Karnataka

PURPOSE

- Temporary Flow Measurements for identified points in Hubballi-Dharwad city and Kalaburagi city for a duration of 24 hours.
- Subcontract for Larsen & Toubro Construction Ltd.

ACTIONS TAKEN

- Carried out flow measurements at water supply lines to measure for a duration of 24 hours at 15 locations in Kalaburagi city and 39 locations in Hubballi-Dharwad city.

Flowrate Graphical Data Representation



Flow measurement @ Kalaburagi



Flow measurement @ Hubballi- Dharwad

RESULTS

- At all locations in the city of Kalaburagi and Hubballi-Dharwad, Flowrates in m³/h, Velocities in m/s and Totalizers in m³ were recorded.

INDUSTRIAL WATER MANAGEMENT & AUDITS

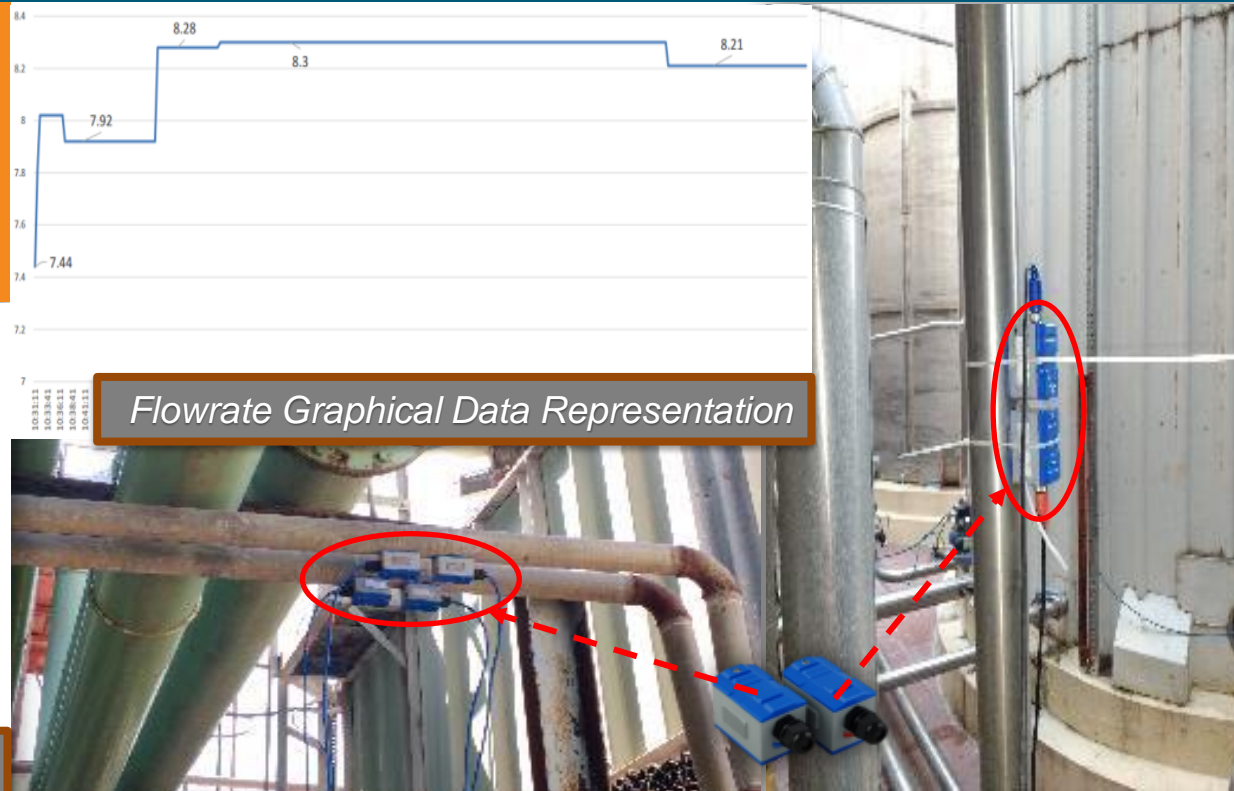
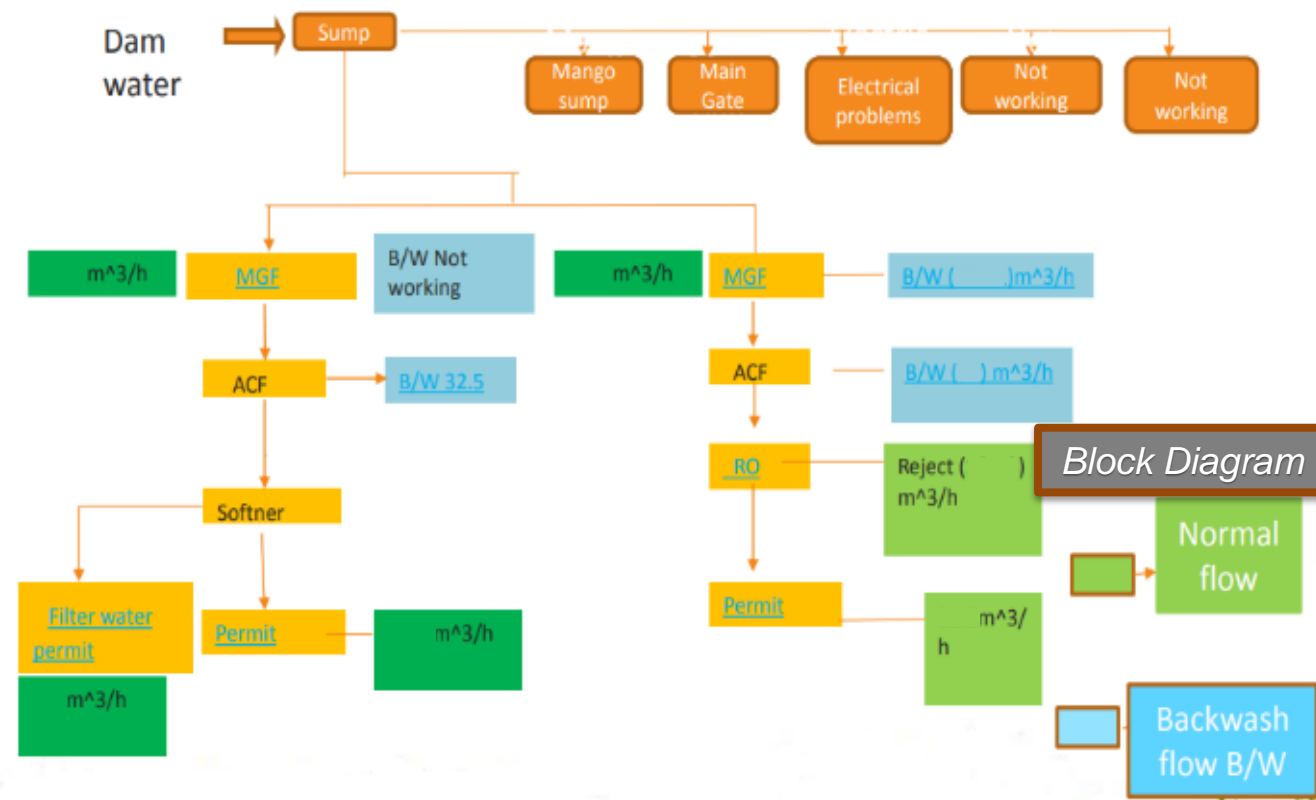
CASE STUDY 1 @ AB InBev, Hyderabad

PURPOSE

- Flow Survey at Anheuser-Busch InBev India Ltd, Hyderabad.

ACTIONS TAKEN

- Carried out flow survey at 30 locations each for a duration of 2.5 hours.
- Flowrates and flow velocities were recorded and graphically represented.



RESULTS

- At all locations, maximum Flowrates in m³/h and maximum Flow Velocities in m/s were recorded and data's were graphically represented.

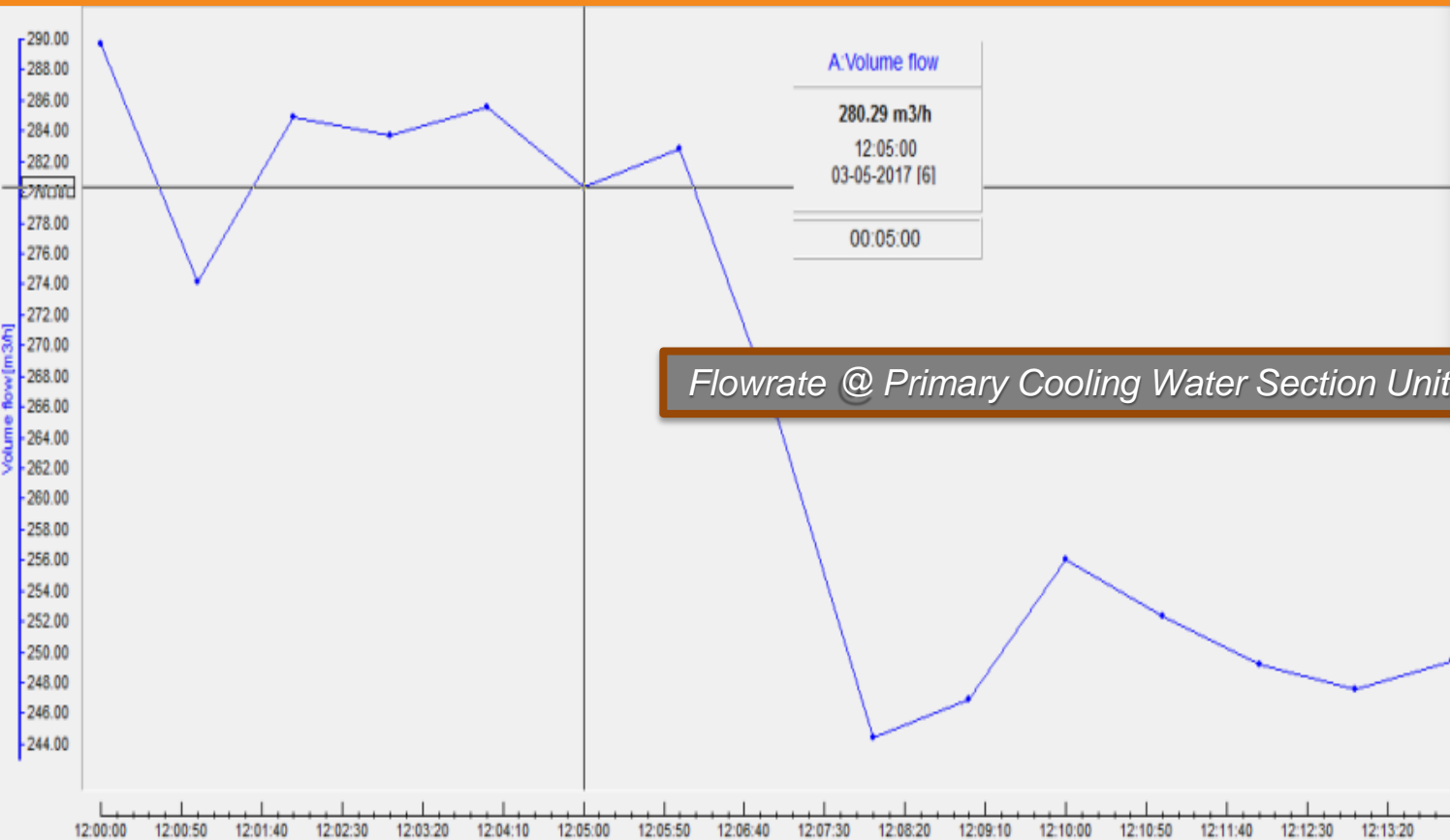
CASE STUDY 2 @ (2 * 50 MW) HEP, NHPC

PURPOSE

- Flow Survey at (2 * 50 MW) Hydro-Electric Project, NHPC, Himachal Pradesh.

ACTIONS TAKEN

- Carried out flow survey at 11 locations.
- Flowrates and flow velocities were recorded and graphically represented.



Flowrate @ Primary Cooling Water Section Unit



Flow survey @ (2 * 50 MW) HEP, Himachal Pradesh

RESULTS

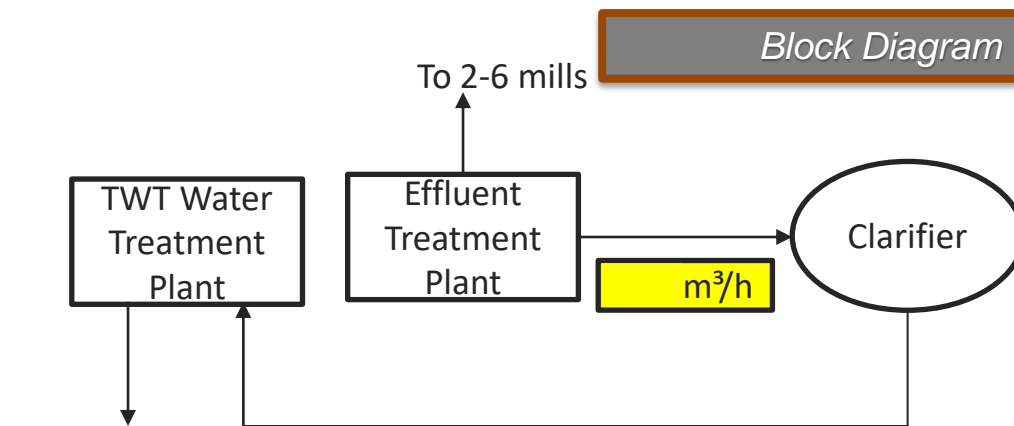
- The Flowrates and the Flow Velocities at all locations were recorded in m³/h and in m/s and were graphically represented.

PURPOSE

- Water Audit at International Paper Andhra Pradesh Paper Mills (APPM), Andhra Pradesh.

ACTIONS TAKEN

- Carried out water audit at 20 locations.



RESULTS

- The Flowrate at all locations were recorded.

PURPOSE

- (5) On-line Flow Measurement of fresh water, service water, ETP treated water & condensate flow at various locations of IOCL Refinery, Assam.
- (6) Flow Measurement of water streams, condensate & BFW for water study by using Clamp-On Flow Meters at IOCL Refinery, Bihar.

ACTIONS TAKEN

- Carried out flow monitoring at 18 major locations at IOCL refinery, Assam.
- Carried out flow monitoring at 20 major locations at IOCL refinery, Bihar.
- Flowrates at every location were recorded.

Flowrate tabulated for one location (Unit Cooling Tower (UTC))

SL.NO	Location/Point Name	Date	Time	Pipe Size(mm)	Flow Rate(m3/h)
1	Unit Cooling Tower Discharge Point 1	16.05.2019	15.05		
2	Unit Cooling Tower Discharge Point 2	16.05.2019	15.20		
3	Unit Cooling Tower Discharge Point 3	16.05.2019	15.45		
4	UCT Return	16.05.2019	16.00		
5	UCT Side Stream Filter Outlet	18.05.2019	10.25		
6	Raw Water to UCT	03.06.2019	17.55		

Totalizer for Service Water Header

S.no	Date	Time	Velocity [m/s]	Flowrate [m³/h]
1	22-01-2019	12:30		
2	22-01-2019	12:31		
3	22-01-2019	12:32		
4	22-01-2019	12:33		
5	22-01-2019	12:34		
6	22-01-2019	12:35		
7	22-01-2019	12:36		
8	22-01-2019	12:37		
9	22-01-2019	12:38		
10	22-01-2019	12:39		
			Totalizer	m3

RESULTS

- At Assam refinery, the Flowrate at all locations were recorded in m³/h.
- At Bihar refinery, the Totalizer at all locations were recorded in m³.

PURPOSE

- Flow Survey at JK Tyres, Chennai.

ACTIONS TAKEN

- Carried out flow survey at 58 locations within 6 major units.
- Flowrates and flow velocities at every location were recorded.

Totalizer for Service Water Header

S.NO	DATE	TIME	LOCATION	FLOW RATE(m ³ /h)	VELOCITY(m/s)
			NEW VAM CHILLER		
1	18.08.2017	12:00:19	PRIMARY PUMP-1		
1	18.08.2017	12:01:16	PRIMARY PUMP-1		
1	18.08.2017	12:02:19	PRIMARY PUMP-1		
2	18.08.2017	12:05:19	PRIMARY PUMP-2		
2	18.08.2017	12:06:19	PRIMARY PUMP-2		
2	18.08.2017	12:07:19	PRIMARY PUMP-2		
3	18.08.2017	12:10:19	PRIMARY PUMP-3		
3	18.08.2017	12:11:19	PRIMARY PUMP-3		
3	18.08.2017	12:12:19	PRIMARY PUMP-3		
4	18.08.2017	12:15:19	HVAC SECONDARY PUMP-1 DELIVERY		
4	18.08.2017	12:16:19	HVAC SECONDARY PUMP-1 DELIVERY		

RESULTS

- The Flowrate at all locations were recorded in m³/h.

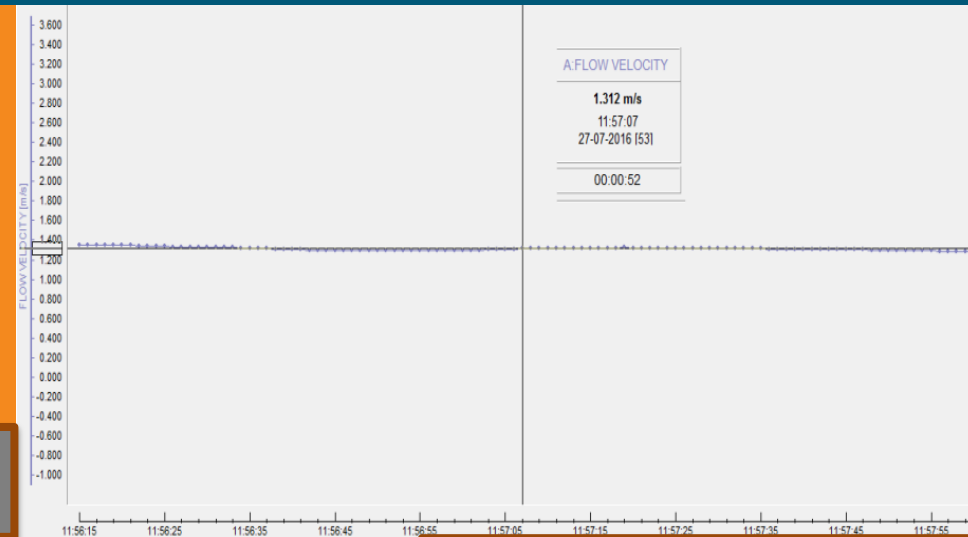
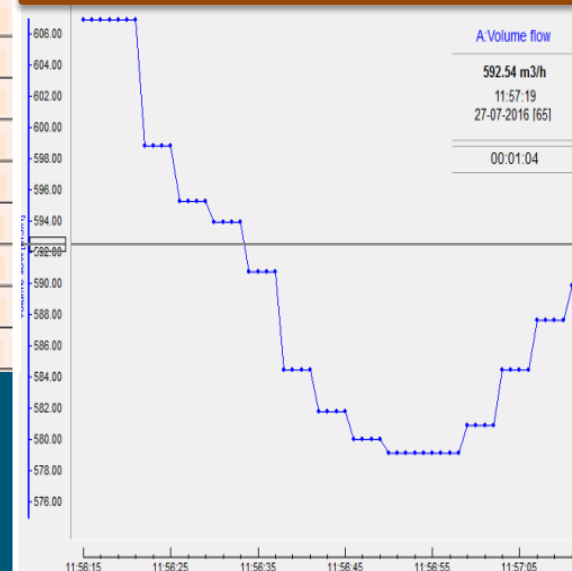
PURPOSE

- Flow Survey at JSW Steel Plant, Mettur, Salem, Tamil Nadu.

ACTIONS TAKEN

- Carried out flow survey at 11 major locations.
- Flowrates and flow velocities were graphically represented.

Flowrate @ CCM2 Cooling Return



Flow velocity @ CCM2 Cooling Return

RESULTS

- The Flowrates at all locations were recorded in m³/h and Velocity in m/s.

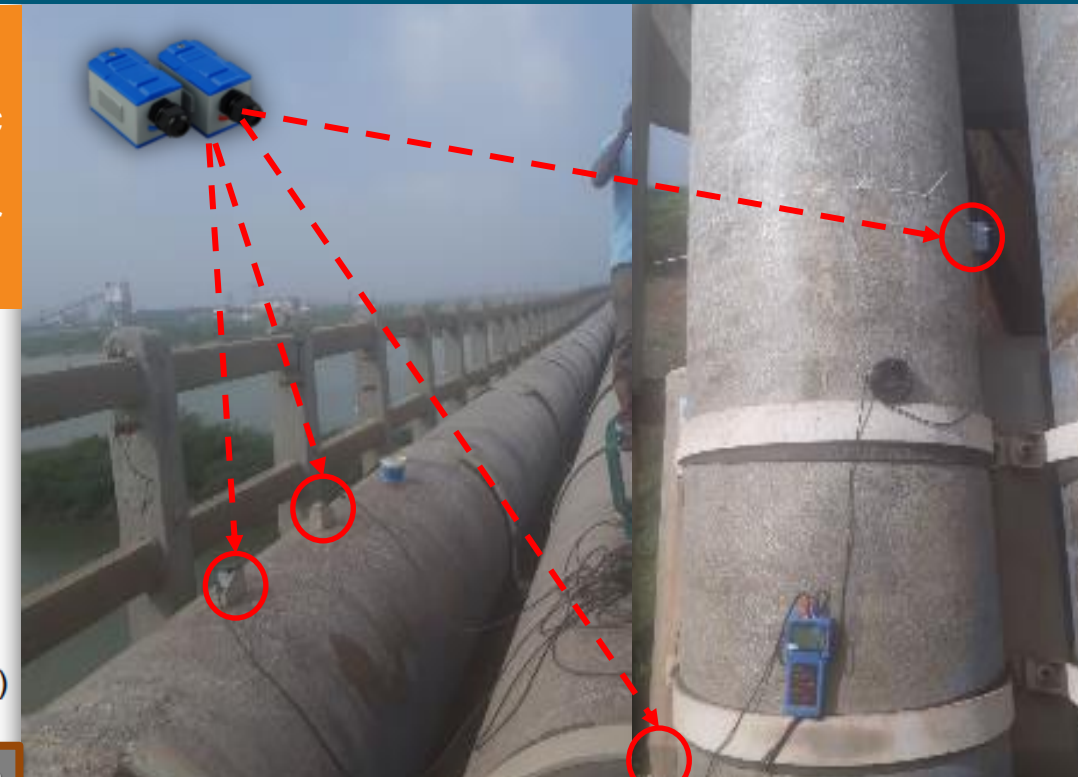
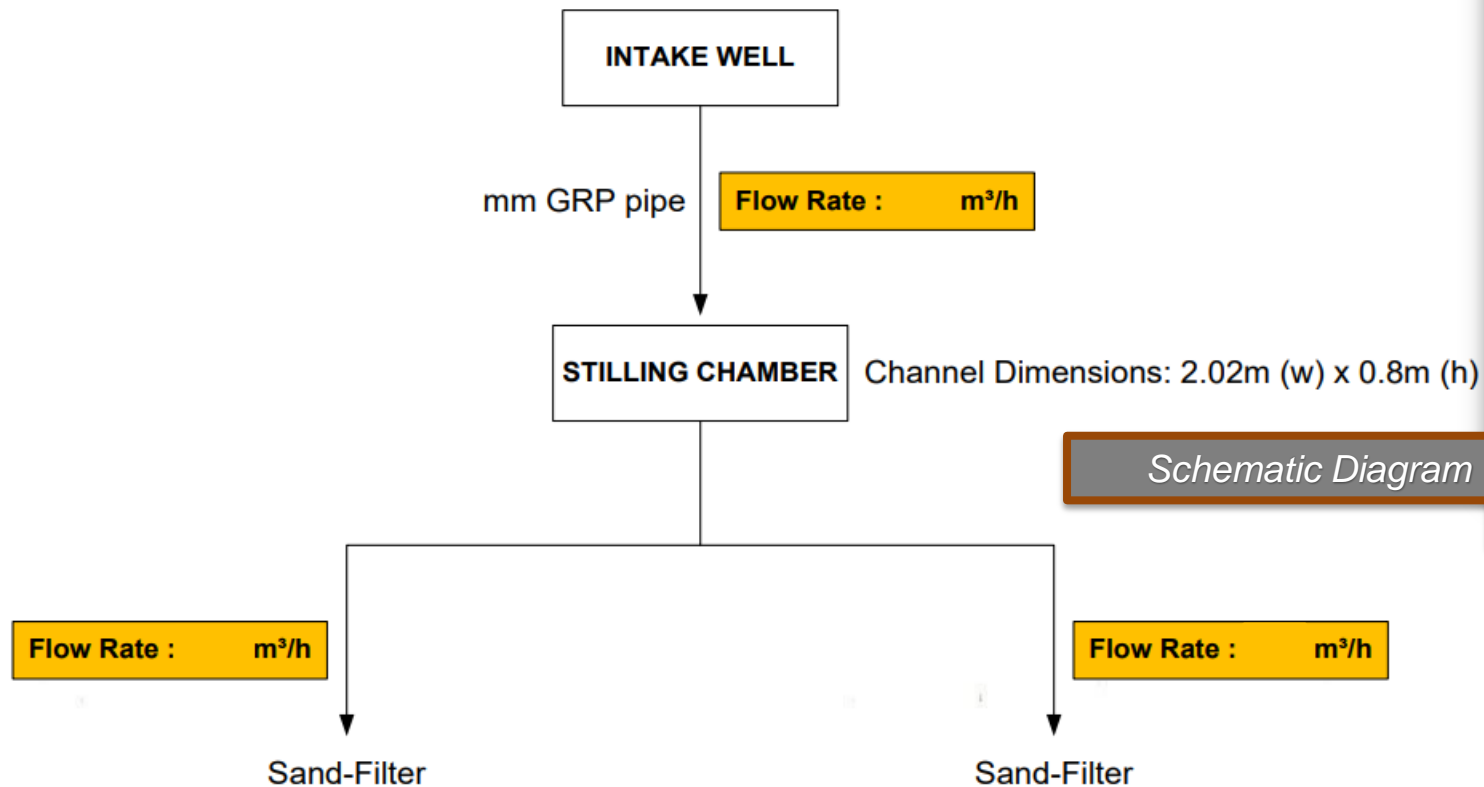
CASE STUDY 8 @ CPCL Plant, Chennai

PURPOSE

- Water Audit for Flowmeter verification at CPCL Plant, Chennai, Tamil-Nadu.

ACTIONS TAKEN

- Carried out water audit for 24 hours at two locations using Ultrasonic Clamp-on Sensor Technology.
- Analyzed and compared the flowrates in the existing flow meter with our test equipment.



Water audit @ CPCL Plant

RESULTS

- At the two locations, Flowrates were compared with the values of the existing flowmeters at the facility.

WASTE WATER MANAGEMENT & AUDITS

PURPOSE

- Open Channel as well as Partial Pipe Sewage Discharge Measurement for Badi Nadi & Choti Nadi Outfalls, Punjab.

ACTIONS TAKEN

- Sewage flow measurement for a duration of 72 hours at 10 locations and 24 hours at 115 locations over a period of 3 weeks.
- Flowrates, flow velocities and levels were tabulated.



Sewage discharge monitoring @ Badi Nadi & Choti Nadi, Punjab



RESULTS

- Recorded per day Outfall on to Choti Nadi & Badi Nadi in m³.

PURPOSE

- Flow Measurement of Old Trunk Sewer (OTS) lines by using open Channel and Clamp-On Flow Meters in Uttar Pradesh.

ACTIONS TAKEN

- Sewage flow measurement at waste water discharges through pipes / channels for a duration of 24 hours at 7 locations.
- Flowrates, flow velocities and levels were tabulated.



Sewer discharge monitoring in Old Trunk Sewer Lines @ Varanasi, UP



RESULTS

- Total Cumulative Flow at all locations were recorded in m³.

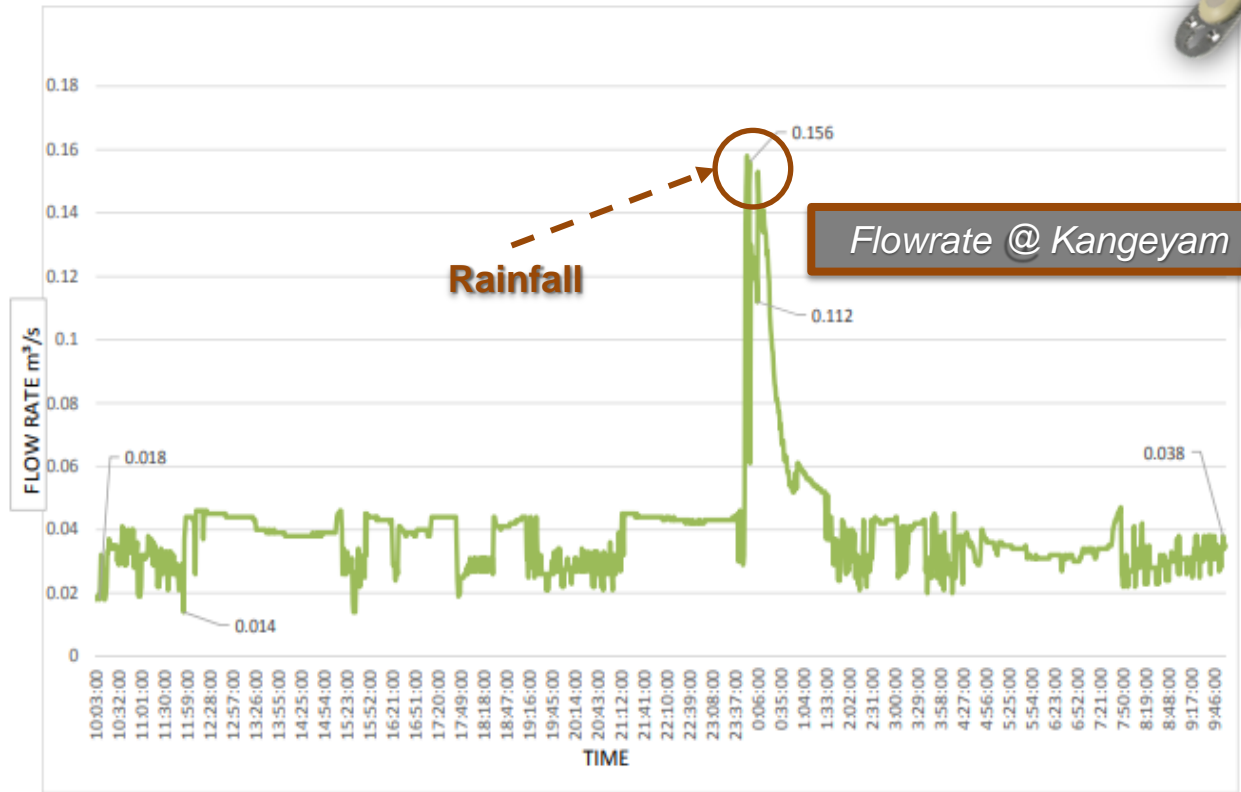
CASE STUDY 3 @ Dharapuram, Kangeyam & Palladam Municipalities, Tamil Nadu

PURPOSE

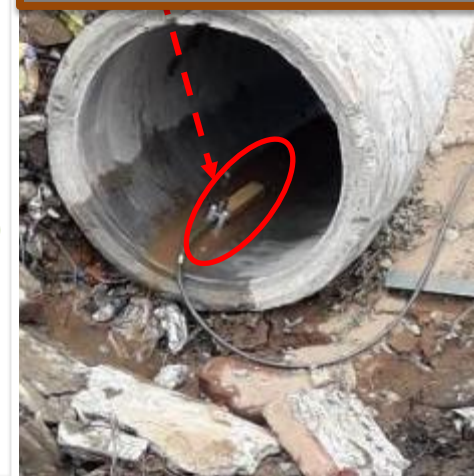
➤ Flow Monitoring in Sewage Water at Dharapuram, Kangeyam and Palladam Municipalities, Tamil Nadu.

ACTIONS TAKEN

- Carried out sewage flow monitoring at Dharapuram, Kangeyam and Palladam municipalities for 72 hours, 24 hours and 5 days.
- Flowrates, flow velocities and levels were tabulated.



Sewage flow monitoring @ Dharapuram, Kangeyam, Palladam Municipalities



RESULTS

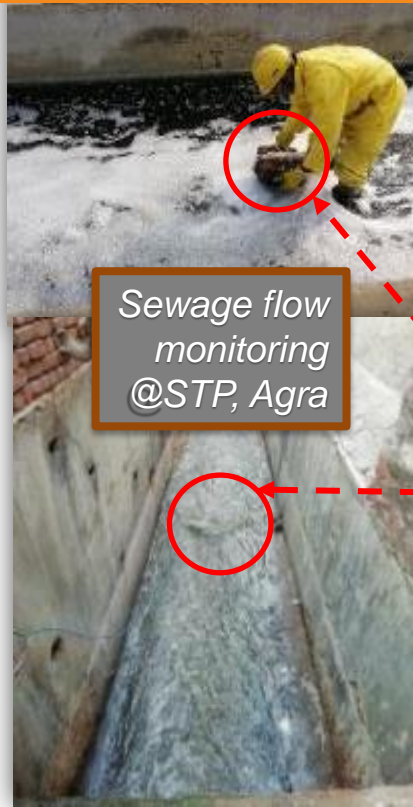
- At Dharapuram, Kangeyam and Palladam Municipalities, the Total Flow were recorded.
- Observed particularly high Flowrate around midnight.

PURPOSE

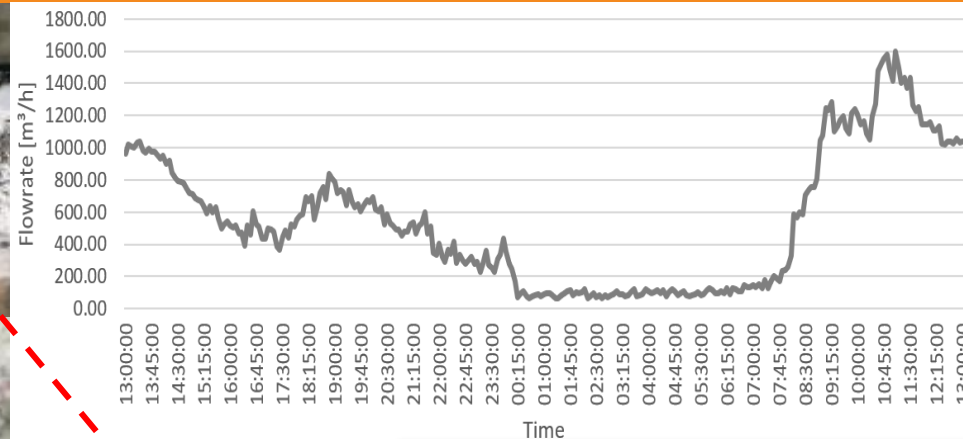
- Sewage Flow Monitoring at the inlets of Sewage Treatment Plant (STP) in the city of Agra.

ACTIONS TAKEN

- Carried out sewage flow measurement at waste water discharges through various channels in STP in Agra for a duration of 24 hours at 10 locations.
- Flowrates, flow velocities and levels were tabulated.
- Compared measured values with the existing V-notch method used at the facility.



Sewage flow
monitoring
@STP, Agra



Flowrate Graphical Data
Representation

RESULTS

- Total Cumulative Flow at all locations were recorded in MLD.
- Determined the measurement error in the V-notch method at the inlet of STP which was more than 15%.

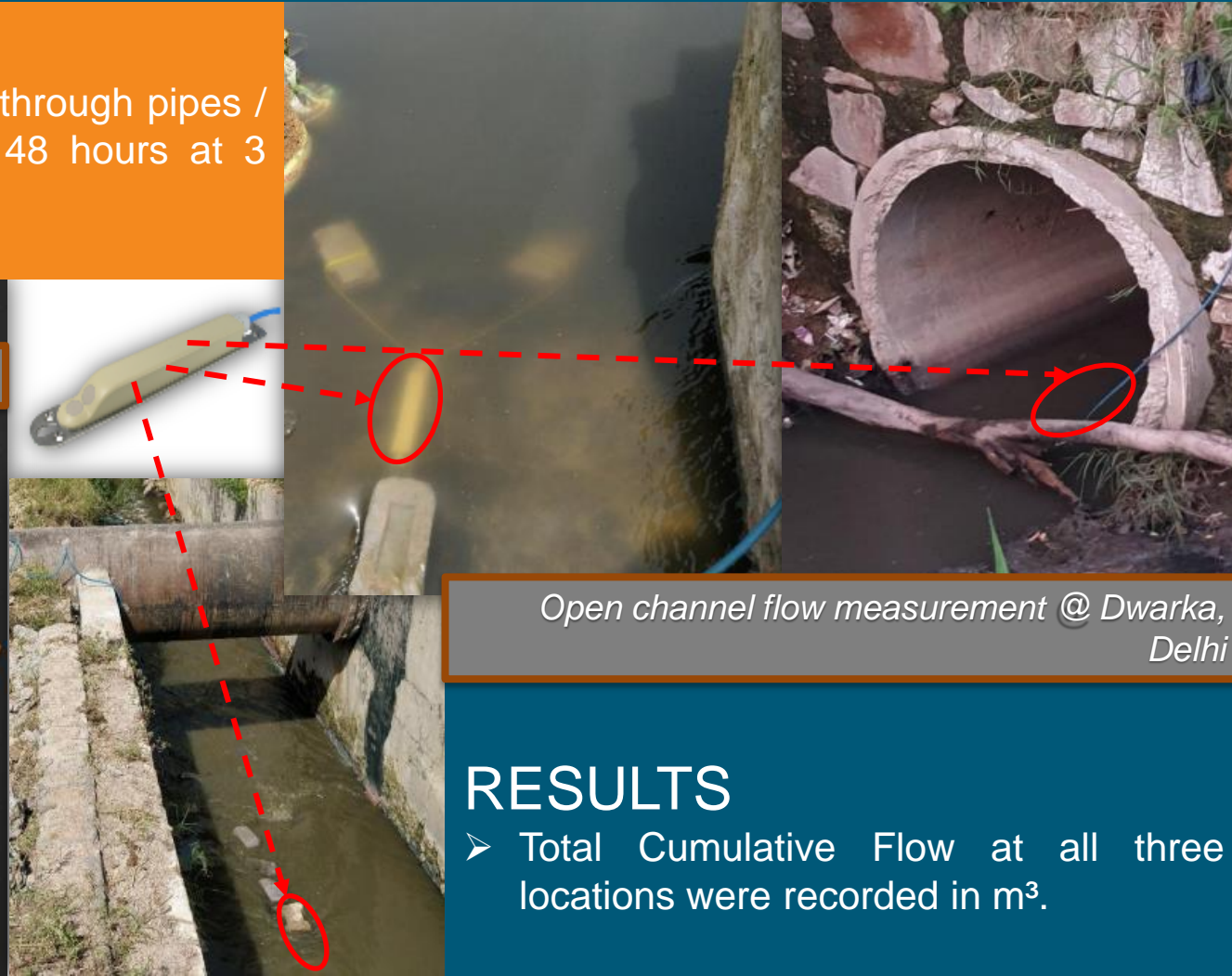
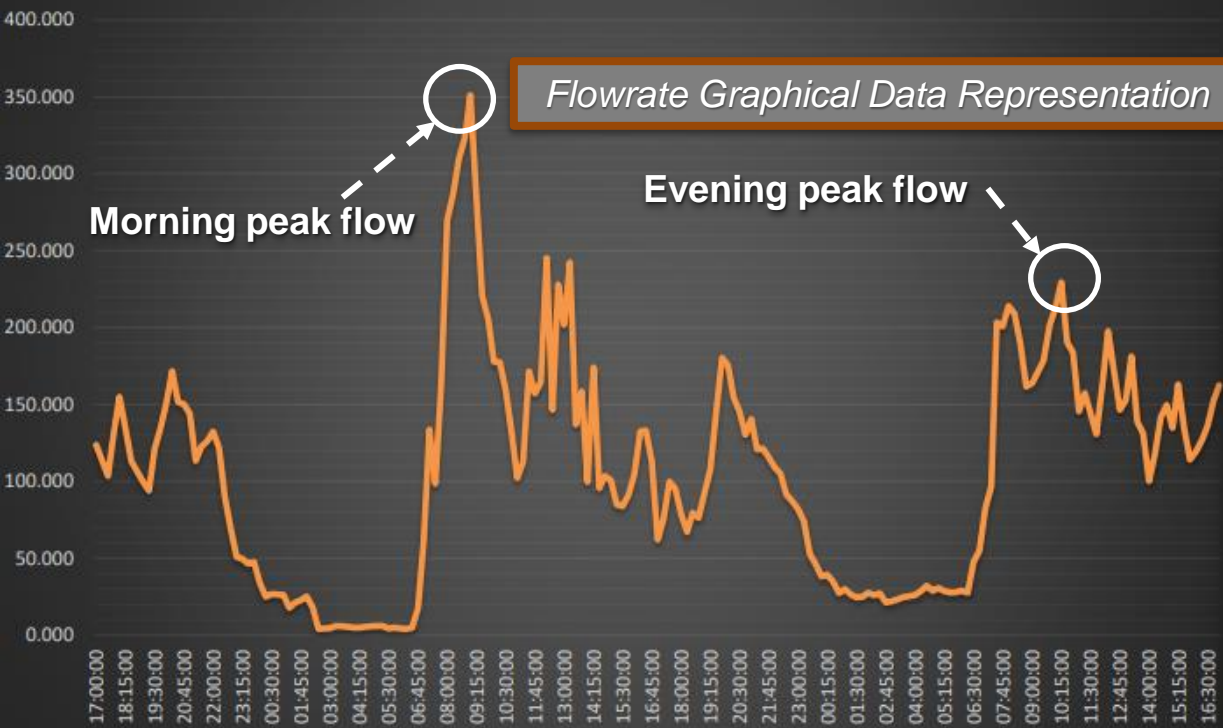
CASE STUDY 5 @ Dwarka, Delhi

PURPOSE

- Sewage Flow Measurement in three drains in Dwarka, Delhi, by using open channel flow meters to ascertain total flow over the period of measurement.

ACTIONS TAKEN

- Carried out flow measurements on waste water discharges through pipes / channels in Dwarka, Delhi to measure for a duration of 48 hours at 3 locations.
- Flowrates, flow velocities and levels were tabulated.



RESULTS

- Total Cumulative Flow at all three locations were recorded in m³.

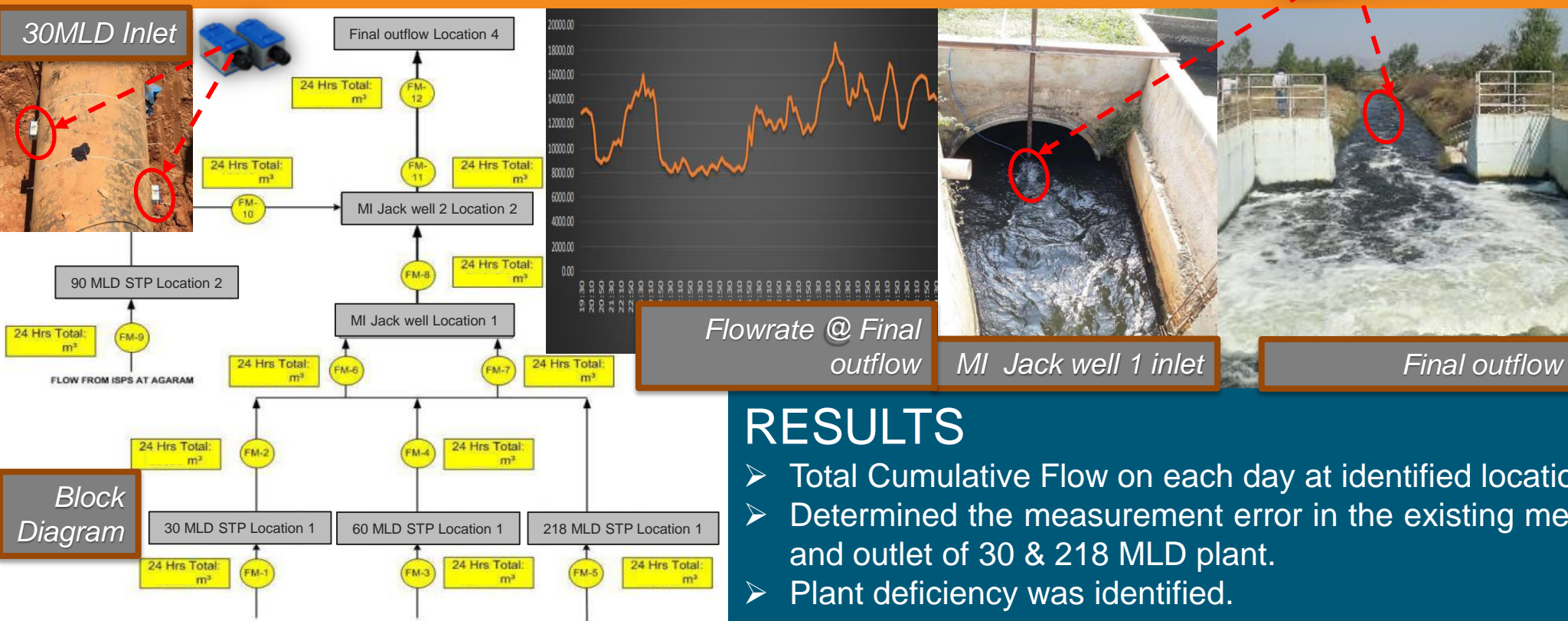
CASE STUDY 6 @ 4 STP's, Karnataka

PURPOSE

- Temporary Flow Measurements of Waste Water at 30, 60, 90 & 218 MLD Sewage Treatment Plants.

ACTIONS TAKEN

- Carried out flow measurements at waste water supply lines for a duration of 16 days at identified points.
- Used Ultrasonic Clamp-on sensor for pipes and Ultrasonic Cross-Correlation Sensor for open channels.
- Flowrates & flow velocities were tabulated and graphically represented.
- Compared measured values with the existing method used at the facility.



RESULTS

- Total Cumulative Flow on each day at identified locations were recorded in m³.
- Determined the measurement error in the existing method at the facility for inlet and outlet of 30 & 218 MLD plant.
- Plant deficiency was identified.

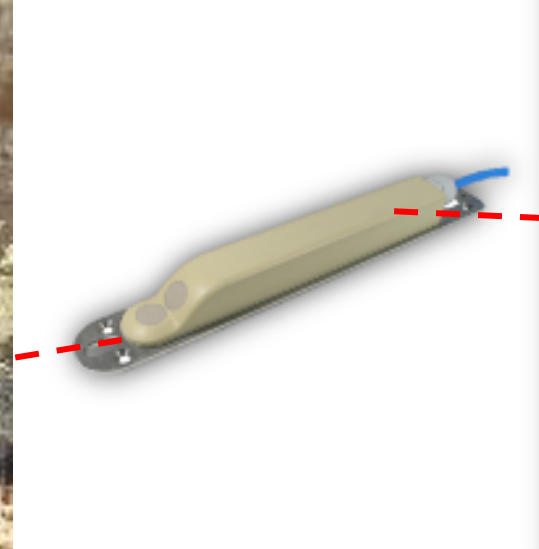
CASE STUDY 7 @ STP, Maraimalai Nagar, TN

PURPOSE

- Sewage Flow Survey at Sewage Treatment Plant (STP) in Maraimalai Nagar.

ACTIONS TAKEN

- Sewage flow measurement for a duration 24 hours.
- Flowrates, flow velocities and levels were tabulated.



Sewage flow survey @STP, Maraimalai Nagar

RESULTS

- The Total Flow in MLD was recorded.
- The plant inflows were significantly higher than expected.

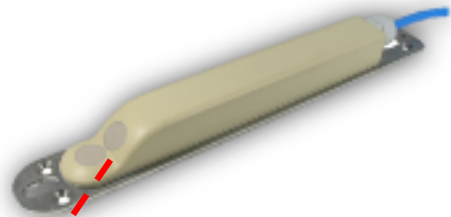
CASE STUDY 8 @ Siruthuli, TN

PURPOSE

- Sewage Flow Measurement in Open Channel in Siruthuli, Tamil Nadu.

ACTIONS TAKEN

- Sewage flow measurement for a duration 24 hours.
- Flowrates, flow velocities and levels were tabulated.



Sewage flow survey @ Siruthuli



Appreciation Letter

RESULTS

- The Total Flow in MLD was recorded.

THANK YOU FOR YOUR INTEREST