



Mueller Service Co.

The Future of Water System Asset Management

Presented By:
Heather Schuchard, GISP

Willamette Valley GIS Users Group Meeting
8/29/2012

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Into Actionable Business Intelligence

Mueller Service Co.

Introductions

Mueller Water Products

- Established in 1857
- Mueller Water Products is headquartered in Atlanta GA. MWA (NYSE Exchange)
- With sales nearing \$1.5 billion, and over 5,000 employees, Mueller Co. is “the oldest and largest full-line supplier of water distribution flow control products in North America”
- Dedicated R&D facilities and new technology

We know water distribution.



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The Family of Mueller Companies

Mueller Co.

Mueller SYSTEMS

Mueller Service Co.

Mueller Canada

echologics
A DIVISION OF MUELLER COMPANY

PRATT[®]
Henry Pratt Company

Hydro Gate

JONES[®]

US PIPE

**VALVE &
HYDRANT
DIVISION**

MILLIKEN[™]
VALVE COMPANY

Smart Move[™]

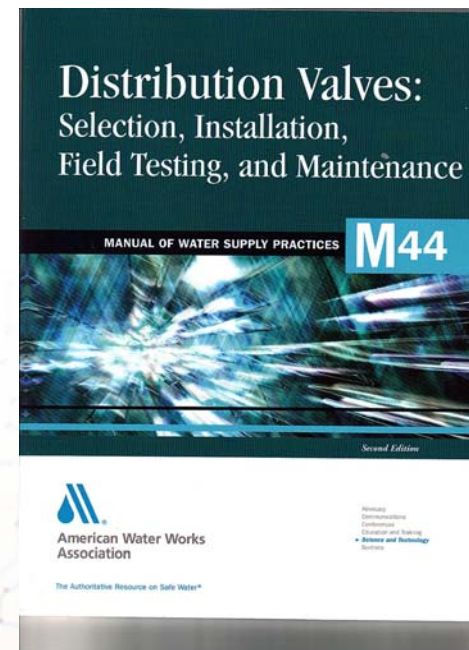
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The need for Asset Management

- 25 year warranty
- Warranty requires annual maintenance
- Manufacturer specs – max recommended torque

Valve Size	Est Cost to Replace
4" Valve	4,500.00
6" Valve	4,500.00
8" Valve	7,500.00
10" Valve	9,500.00
12" Valve	11,000.00
14" Valve	11,000.00
16" Valve	18,000.00
18" Valve	18,000.00
20" Valve	30,000.00
24" Valve	30,000.00
30" Valve	30,000.00
36" Valve	35,000.00
42" Valve	45,000.00
48" Valve	55,000.00
54" Valve	65,000.00
60" Valve	75,000.00



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Asset Management (definition)



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Asset management

From Wikipedia, the free encyclopedia

Asset management, broadly defined, refers to any system that monitors and maintains things of value to an entity or group. It may apply to both tangible assets such as buildings and to intangible concepts such as [intellectual property](#) and [goodwill](#). Asset management is a systematic process of operating, maintaining, upgrading, and disposing of assets cost-effectively, ([American Associate of State Highway and Transportation Officials](#)). Alternative views of asset management in the engineering environment are: The practice of managing assets to achieve the greatest return (particularly useful for productive assets such as plant and equipment), and the process of monitoring and maintaining facilities systems, with the objective of providing the best possible service to users (appropriate for public infrastructure assets). Most active money managers produce worse returns than an index, such as the [Standard & Poor's 500](#).^[1] (the main reason for this is that no matter how well the fund tracks the index, the manager will take out their fee, reducing the return).

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Asset Management (definition)



American Water Works
Association

The Authoritative Resource on Safe Water®

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Denver, CO 80235-3098
T 303.794.7711
F 303.794.7310
www.awwa.org

Statement of Policy on Public Water Supply Matters

Asset Management

AWWA believes that water utilities must adopt a proactive approach to the management of their assets, which commences with planning and design and continues through operation and maintenance on to rehabilitation and replacement.

The major assets of the water utility are included in its infrastructure. The purpose of maintaining water utility infrastructure is to provide continuous, cost-effective, reliable supply and delivery of an adequate quantity of safe water. Each component of the infrastructure should be planned, designed, and specified to be integrated into the existing infrastructure. Installation of each system shall be in accordance with appropriate standards and provide reasonable continuity of service to the customer.

The infrastructure shall be monitored and maintained to ensure satisfactory performance. Minimal

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Condition Assessment
& Remediation Services

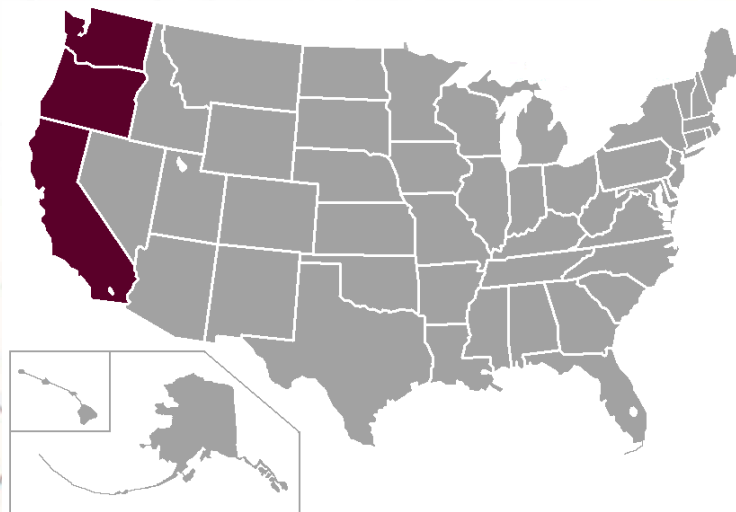
Mission Statement:
Transform Infrastructure Data
Into Actionable Business
Intelligence

- Traditional O&M Field Services
 - Short or long term staffing
 - GIS-centric operations and work order integration
 - Valve Turning
 - Hydrant Maintenance
 - Flushing (conventional and unidirectional)
- Remediation Services
 - Valve & Hydrant Replacement
 - Emergency services
- Condition Assessment
 - Entire system, large valves only or pilot area
 - Valve turning
 - Asset Inventory
 - CMMS Integration
 - Preventative Maintenance Plan
- GIS hub for all Mueller companies and expand technology solutions

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Trend #1 – Pacific Northwest AMI Meters

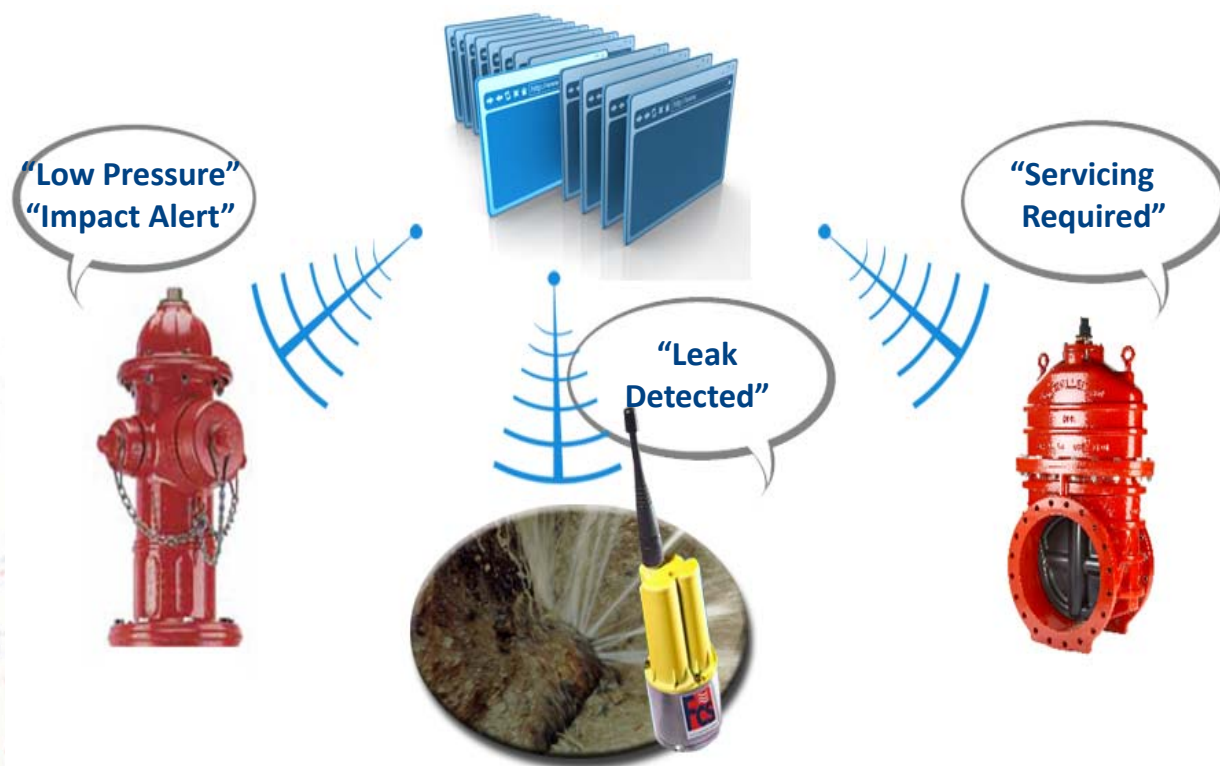
- Projects with Port Angeles WA, Nob Hill Water Association, and growing
- Using AMI meter project to enhance their GIS and finally build geometric network
- Heather Schuchard, GISP is your dedicated West Coast Sales Manager and will be visiting water agencies across the state (field operations managers)
- Field staff based in Yakima Tri-Cities WA



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Merging Intelligence with infrastructure



Sensors



Network



Smarts

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- Communicates with consumers
- Enables transparent bills
- Alerts when needed
- Changes behavior when asked

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“I Can’t Believe My Bill”



**Monthly
Non-
itemized
Bill**



Hourly billing creates a transparent bill that customers can believe

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WEB-BASED CONSUMER PORTALS



Enables utilities to strengthen relationships with consumers by providing a consolidated view of their water and electricity consumption online to help them better understand and manage usage behavior and enhance communication with their utility.

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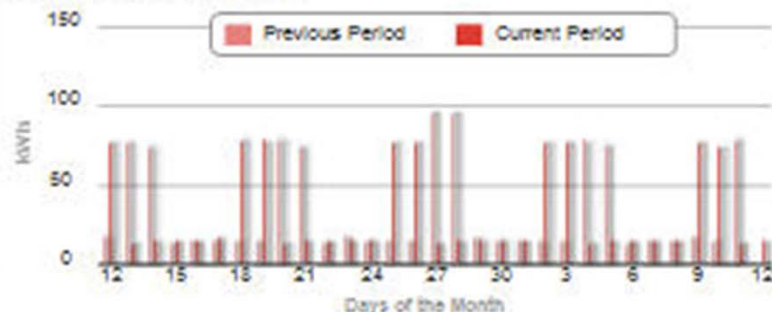
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Actual Consumption: 3599 Gallons
Next Month Projections: 0 Gallons



[View Details](#)

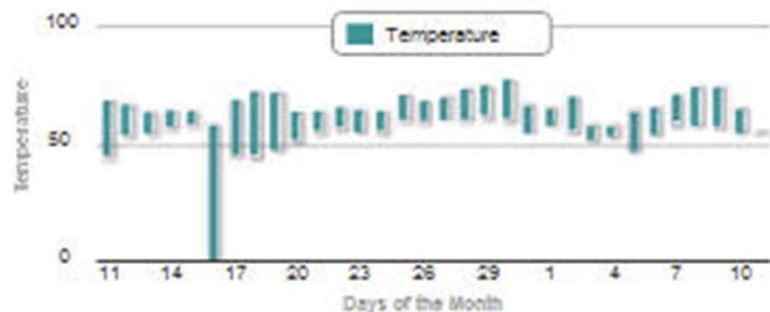
Actual Consumption: 1008.8 kWh
Next Month Projections: 0 kWh



[View Details](#)

Weather

Daily Temperature 05/12 - 06/11
Hi Temp 77° Low Temp 0°



Video

Home Performance with Energy Star

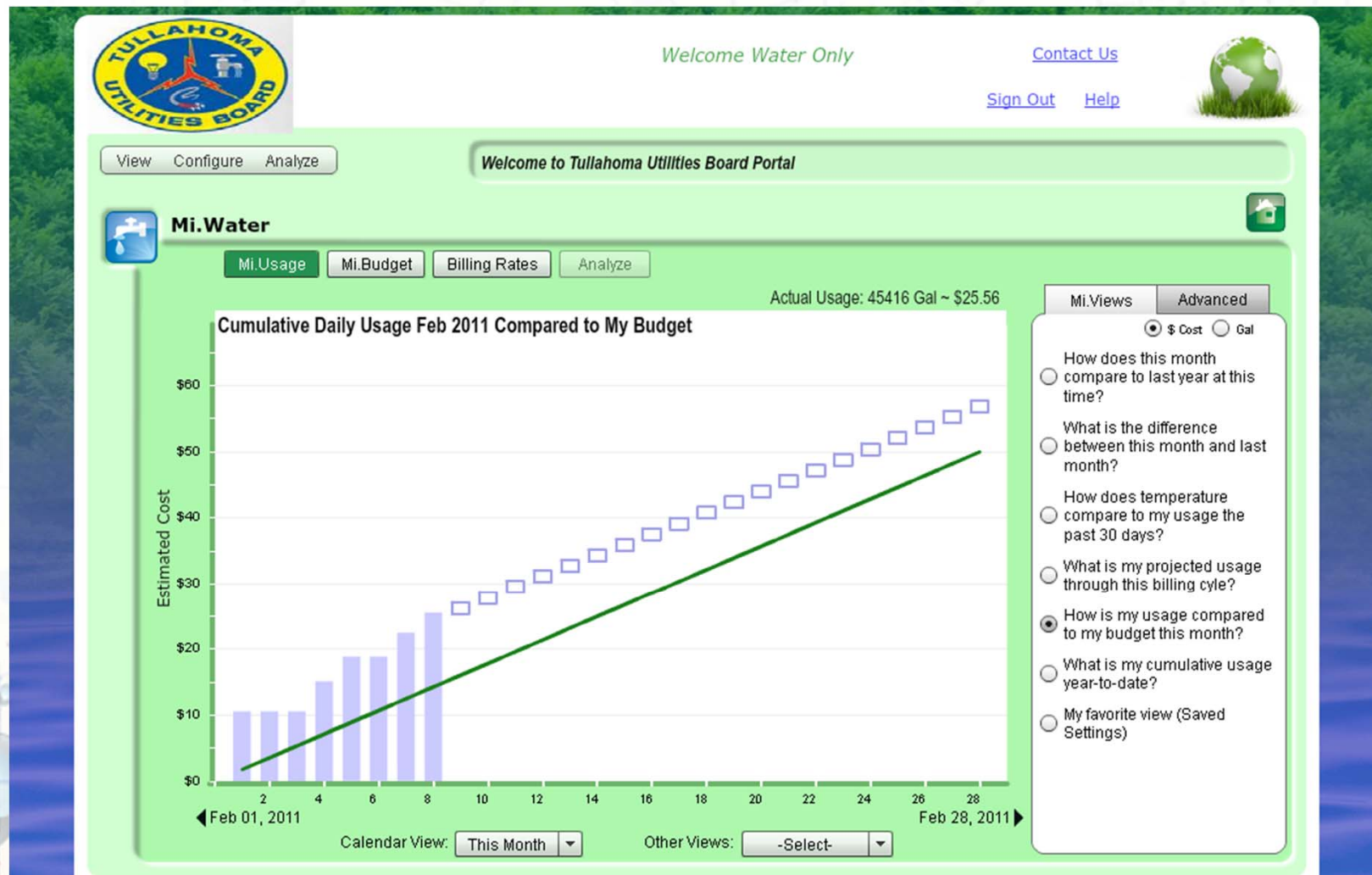


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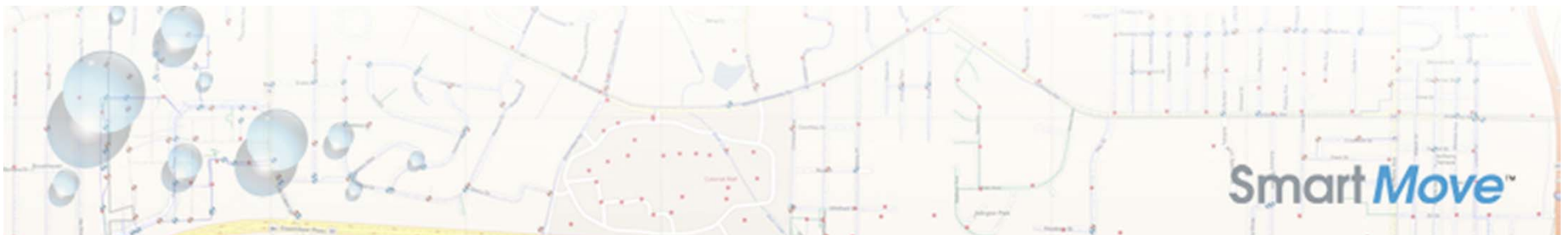
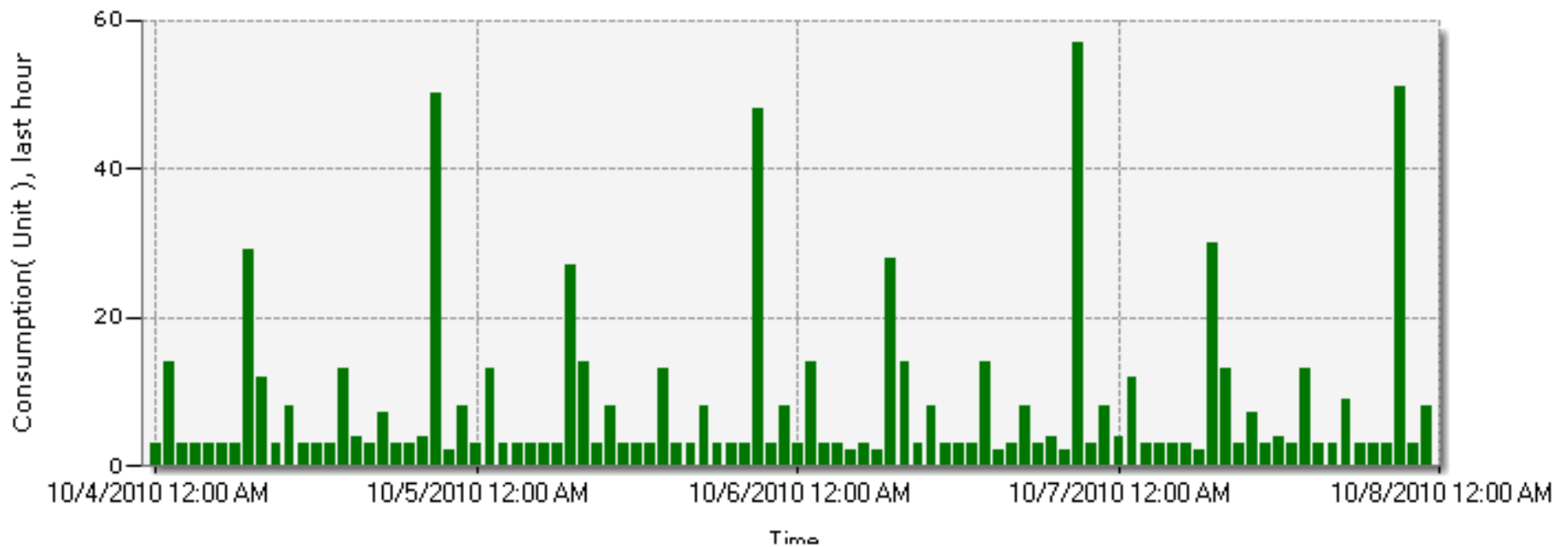
Set conservation targets



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Leak Detection – Find leaks when they happen and text or email consumers before the problem grows.



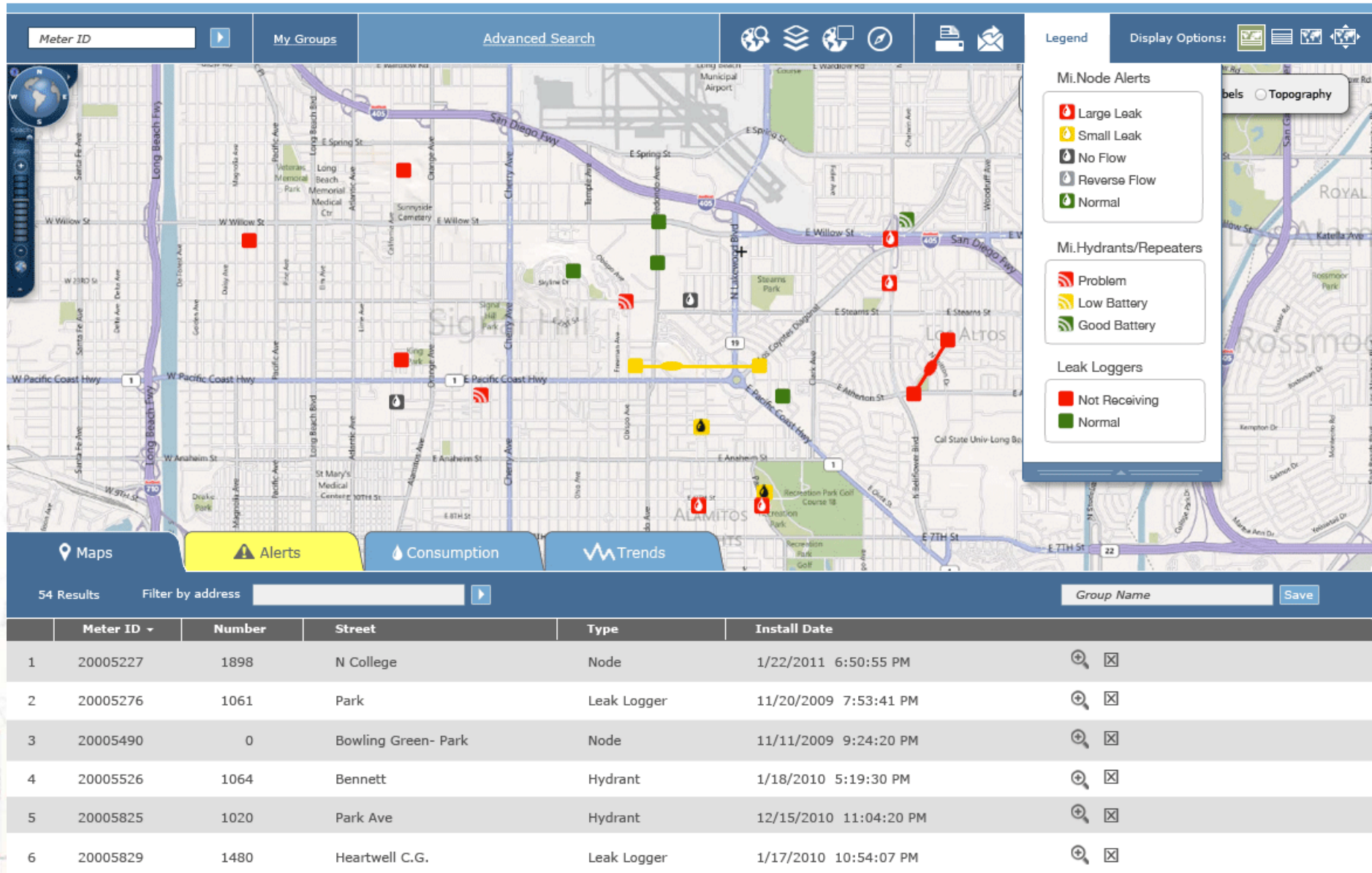


WATER ALERT SYSTEM

Long Beach, CA

Powered by **Mueller SYSTEMS**

Readings as of 02/21/2012 12:31PM



Demonstration Sites

Mi.Host Demo Site

<http://demo.muellersystems.net>

Username: admin

Password: demo

Water Alert System

<http://lds.muellersystems.net/lds/login.aspx>

Username: admin

Password: M!H0\$t2011

Utility Portal

http://demoup.muellersystems.net/mihan_utilityportal.html#accountManagement

Username: superadmin

Password: mueller

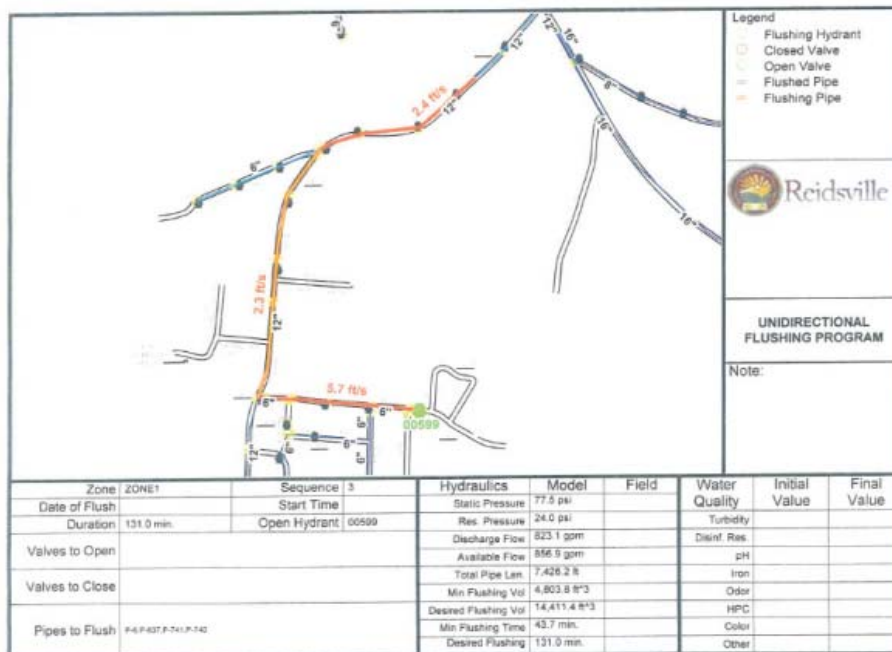
Consumer Portal

http://democp.muellersystems.net/mihan_consumerportal.html#accountManagement

Username: chris

Password: Mu3LLer

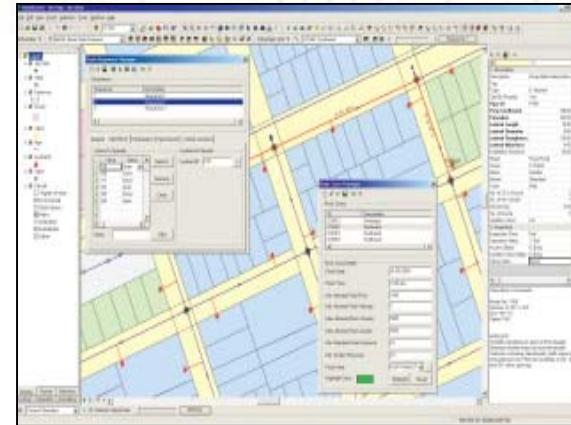
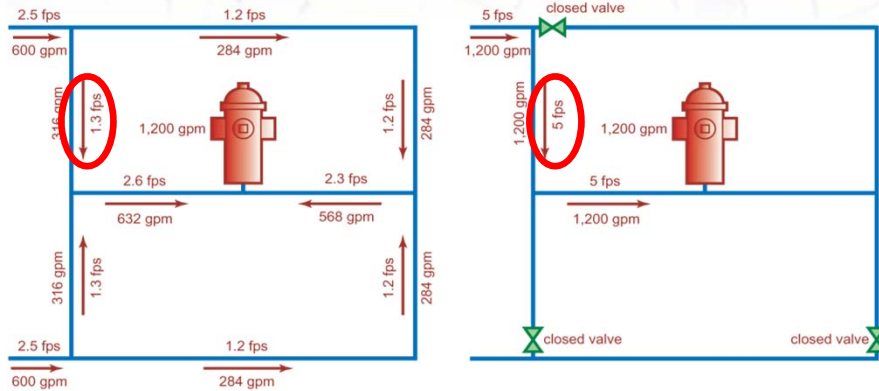
Trend #2 – Unidirectional Flushing



- Unidirectional flushing achieves water flow velocities of up to 5 ft/sec
- UDF creates a scouring effect and removes deposits and debris.
- MSC conducts flushing activities using sequence maps and provides water quality testing services.

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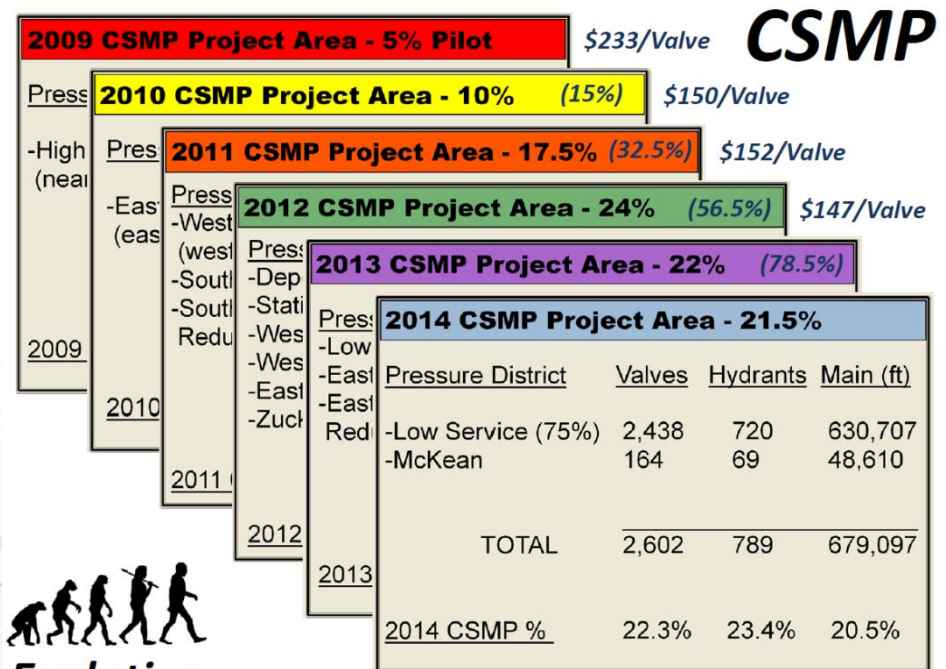
- Systematic method of closing valves and opening hydrants to direct water at high velocities through targeted segments of pipe.
- Flushing begins at clean supply sources such as water plants, pump stations and tanks.
- Closing valves in a prescribed sequence creates one-way flow into each segment from other pipes that have been flushed previously.
- Hydrants are opened to induce water velocities high enough to scour sediment and biofilm from the walls of the pipes.

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Trend #3 – Focus on data benchmarking

Comprehensive System Maintenance Program (CSMP)

- *A 5-Year strategically planned initiative to inspect, operate, and maintain valves, hydrants, and water mains. During this initiative metrics will be collected to indicate system health, define operational benefits, and establish benchmarks.*
 - Hydrant and Valve O&M
 - Valve Turning
 - Unidirectional Flushing
 - C Factor Testing
 - Water Quality Testing
 - Hydrant Flow Testing
 - GPS Collection
 - GIS Data Collection

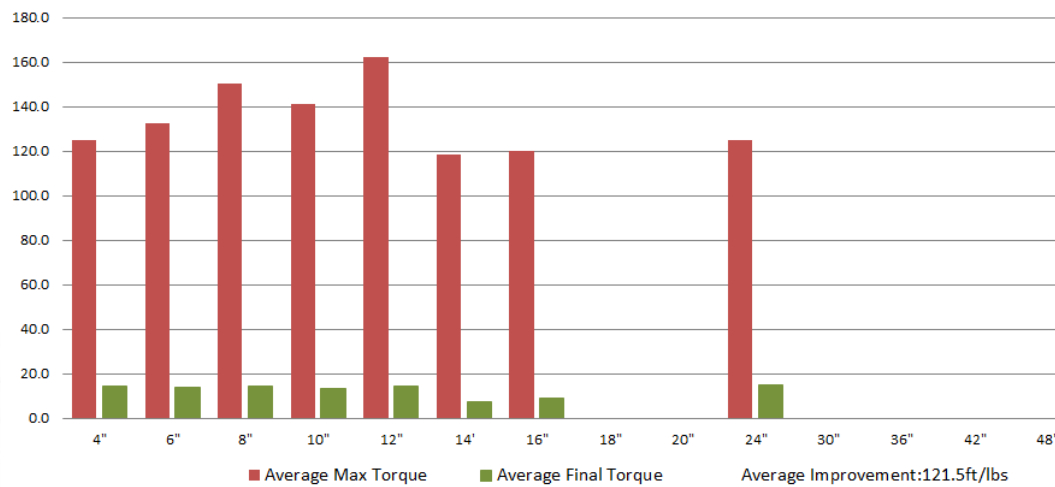


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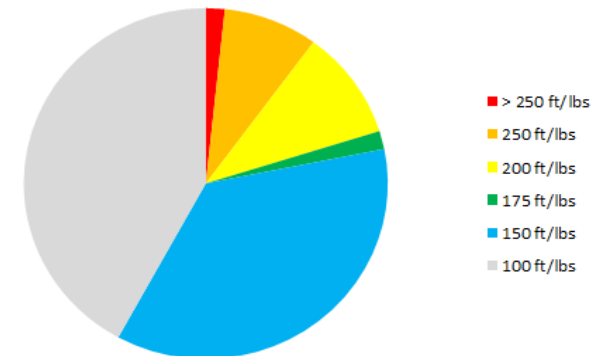
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Sample Statistics

Average Operating Torque Improvement



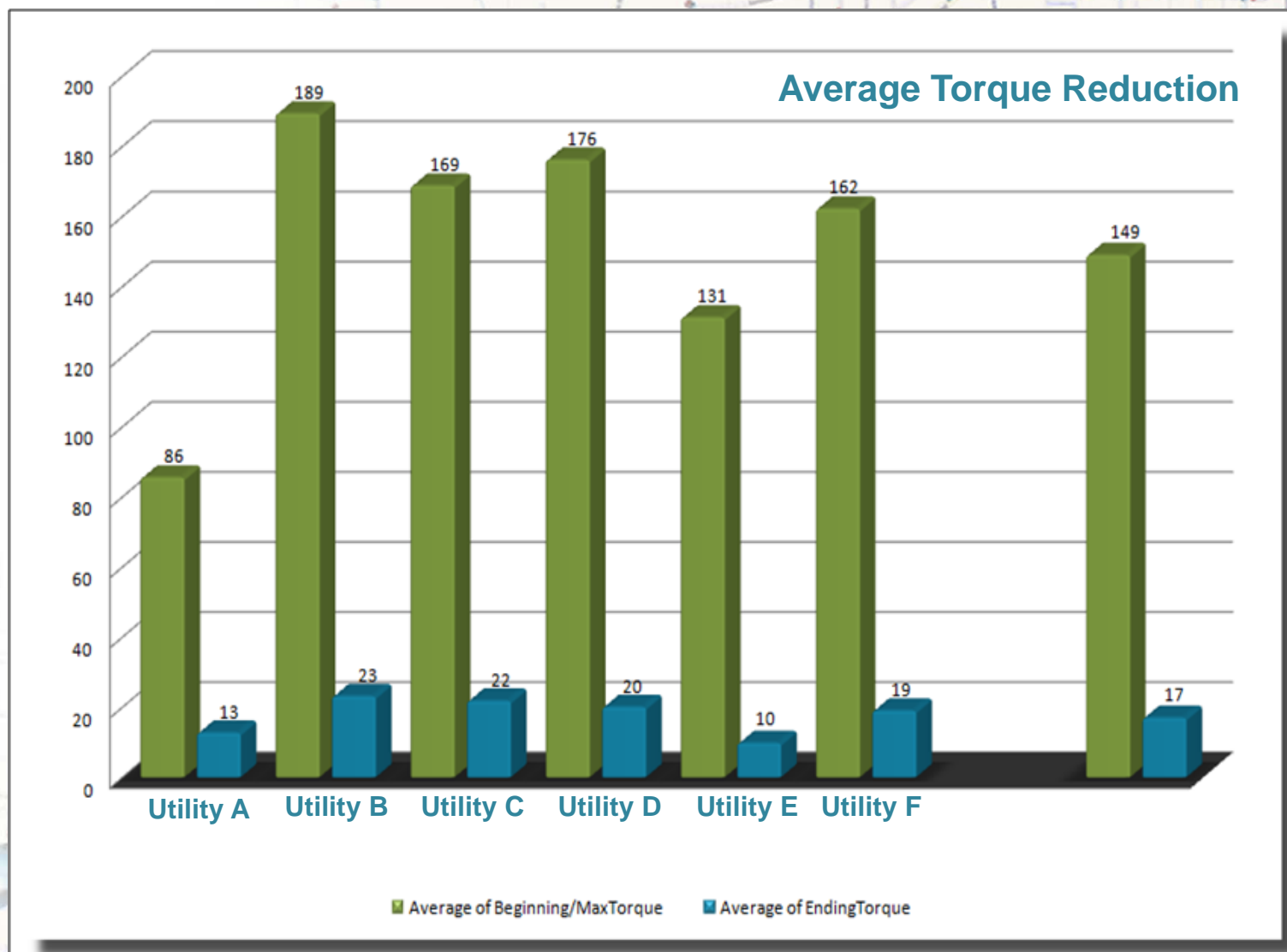
	Count	Percentage
> 250 ft/lb	2	2%
250 ft/lbs	10	8%
200 ft/lbs	12	10%
175 ft/lbs	2	2%
150 ft/lbs	43	36%
100 ft/lbs	50	42%



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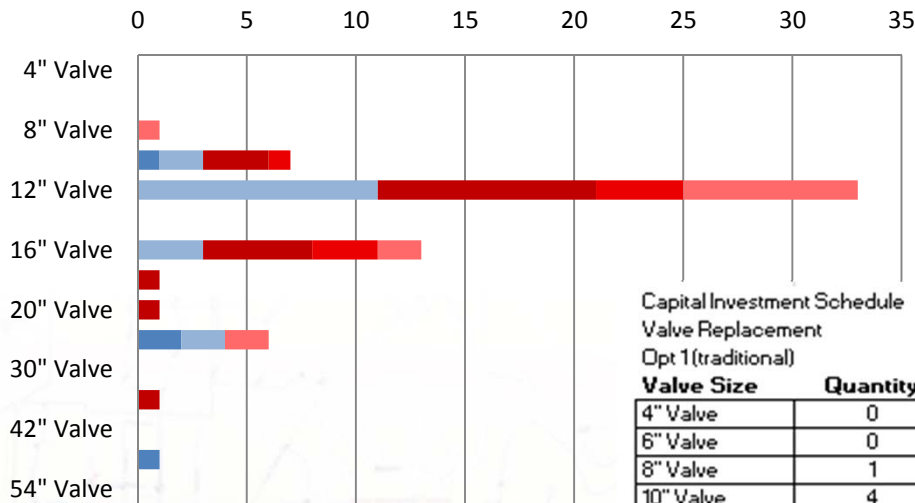
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Sample Statistics

Inoperability Type By Size



■ Valve Box Repairs

■ Paved Over

Remediation

■ Broken

■ Spins Free

■ Frozen Open

Capital Investment
Required

Capital Investment Schedule
Valve Replacement
Opt 1 (traditional)

Valve Size	Quantity	Est Cost to Replace
4" Valve	0	-
6" Valve	0	-
8" Valve	1	7,500.00
10" Valve	4	38,000.00
12" Valve	22	242,000.00
14" Valve	0	-
16" Valve	10	180,000.00
18" Valve	1	18,000.00
20" Valve	1	30,000.00
24" Valve	2	60,000.00
30" Valve	0	-
36" Valve	1	35,000.00
42" Valve	0	-
48" Valve	0	-
54" Valve	0	-
60" Valve	0	-
Total	42	\$ 610,500.00

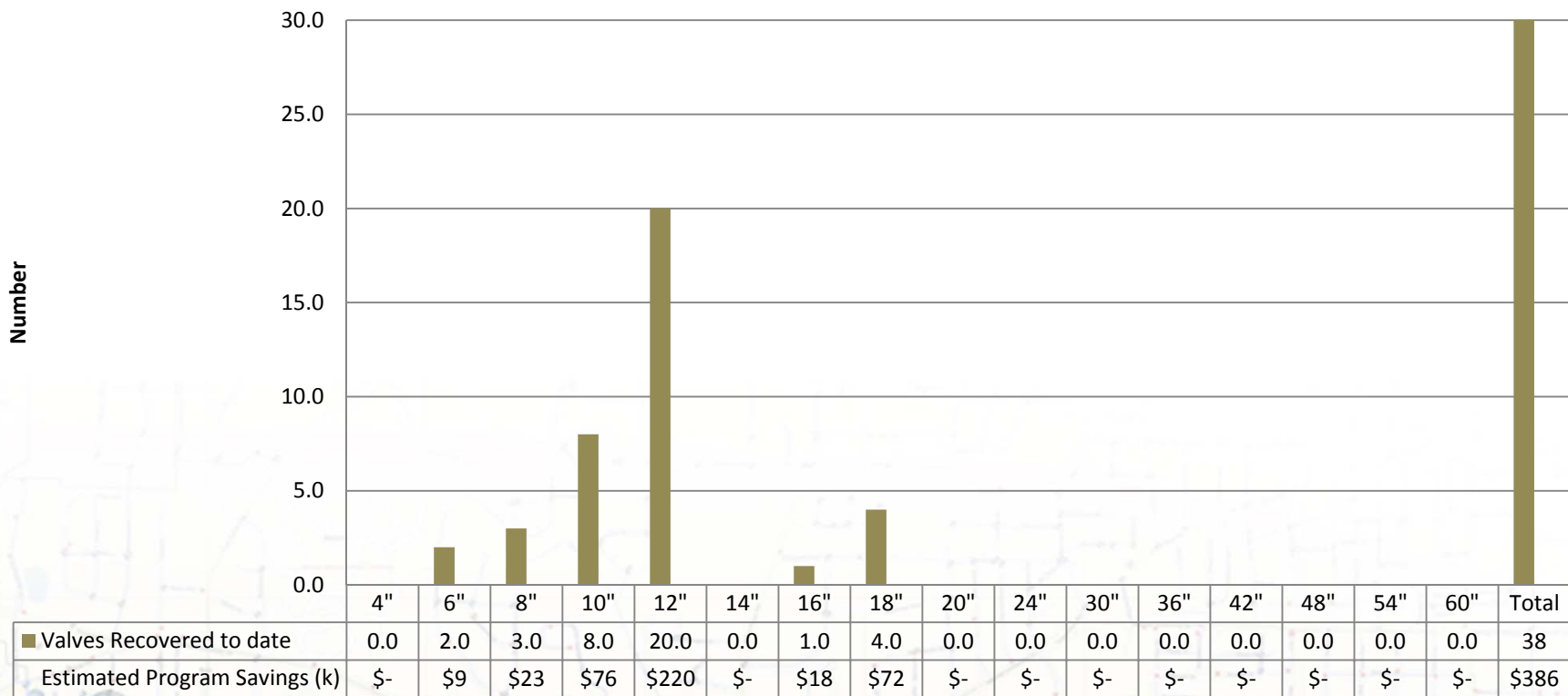
Capital Investment Schedule
Valve Replacement
Opt 2 (insertion valve where available up to 24")

Valve Size	Quantity	Est Cost to Replace
4" Valve (EZ)	0	-
6" Valve (EZ)	0	-
8" Valve (EZ)	1	4,361.00
10" Valve (EZ)	4	23,948.00
12" Valve (EZ)	22	164,846.00
14" Valve (trad)	0	-
16" Valve (EZ)	10	215,010.00
18" Valve (trad)	1	18,000.00
20" Valve (trad)	1	30,000.00
24" Valve (EZ)	2	55,532.00
30" Valve (trad)	0	-
36" Valve (trad)	1	35,000.00
42" Valve (trad)	0	-
48" Valve (trad)	0	-
54" Valve (trad)	0	-
60" Valve (trad)	0	-
Total	42	\$ 546,697.00

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Valves Recovered to Date



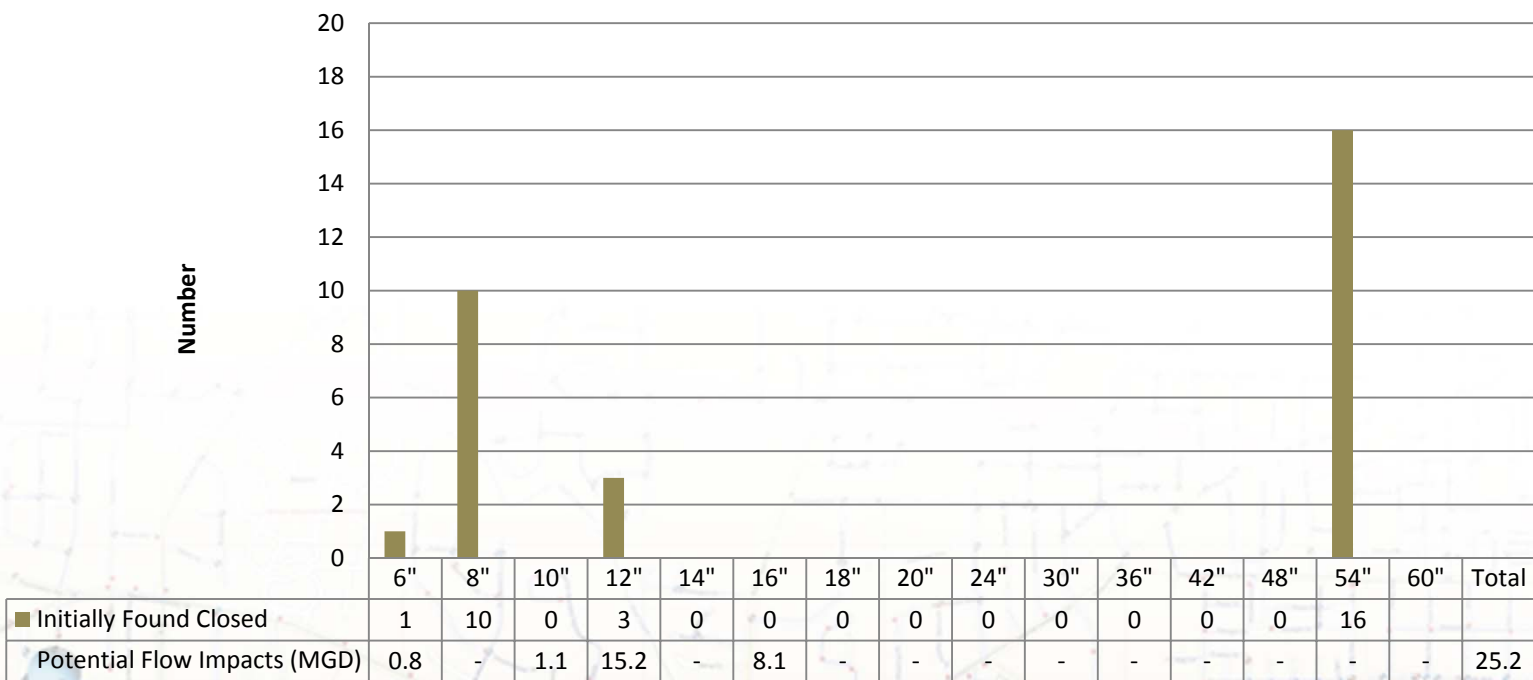
Estimated Program Savings (k)	\$386
Program Cost To Date (k)	\$146
Program ROI	264%

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Valve Found Closed and Flow Impacts



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Data Functionality Index (DFI)

- Weighted, User-Customized Matrix
- Breaks Down Features and Attributes
- Blends Completeness and Importance
- A Slice of Data in Time
- **What is it?**

- Compartmentalize
- Organize
- Prioritize
- Adds Objectivity

Data Completeness		
4/1/2011	12/1/2011	6/14/2012
45.11%	50.91%	61.28%
16.17% Improvement		
Data Functionality Index		
4/1/2011	12/1/2011	6/14/2012
60.11%	72.70%	81.01%
20.90% Improvement		

Answers and Reports	
Show Current View Counts	
MLV Inspection	
2012 CSMP Progress	
MLV Inspection	
MLV Operation	
MLV Operation 2	
MLV Maintenance	
Hydrant Inspection	
Hydrant Operation	
Hydrant Operation 2	
Hydrant Maintenance	
Hydrant Valve Inspect	
(36) Valve Box Misaligned/Inop	
(0) Missing/Damaged Lids	
(108) Valve Box Status Unknown	
(108) Valve Box Status Aligned	
(2,181) GRADE STATUS	
(53) Valves Above Grade	
(1,022) Valves at Grade	
(94) Valves Below Grade	

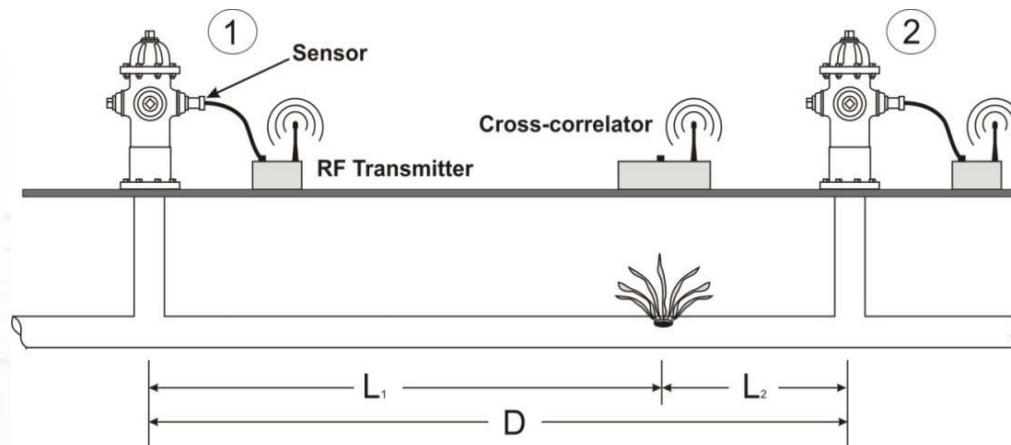
Trend #4 – Leak Detection (TMLD)

Correlation Theory:

Bracket leak with 2 Sensors

Leak noise takes longer to arrive at Sensor 1 than Sensor 2

Correlator measures difference and determines distance to leak



echologics
A DIVISION OF MUELLER COMPANY

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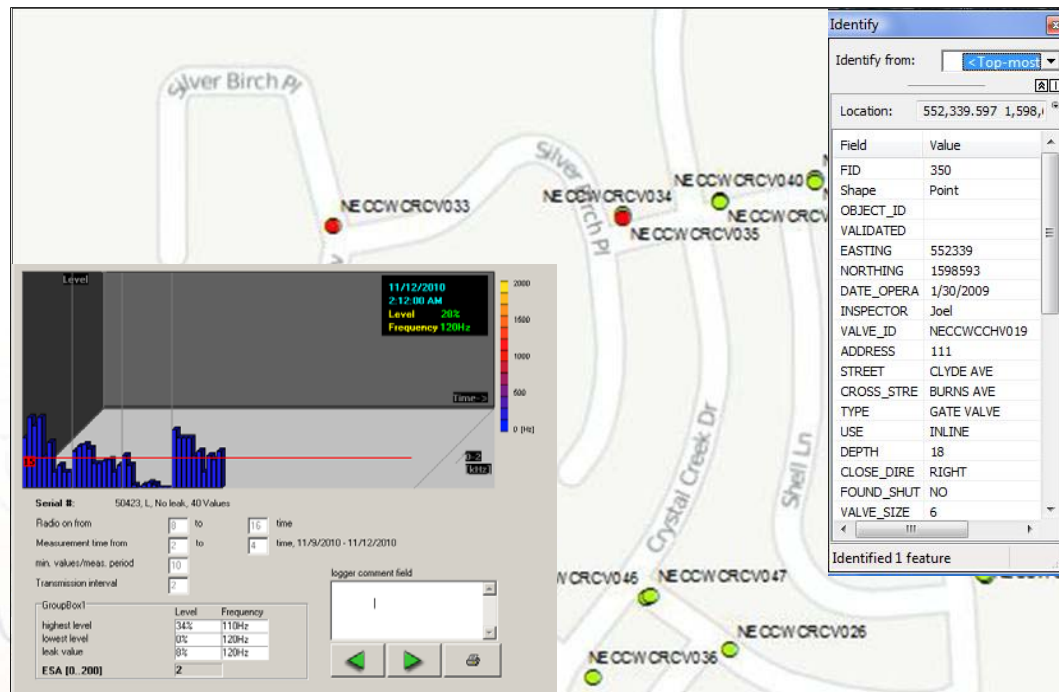
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Leak Detection

Information is read and
delivered to GIS for integration
Deployed sensors capture data
into utility SCADA work orders
frequency measurements during
management systems
non peak hours & play in

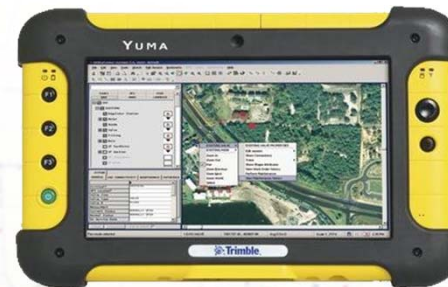
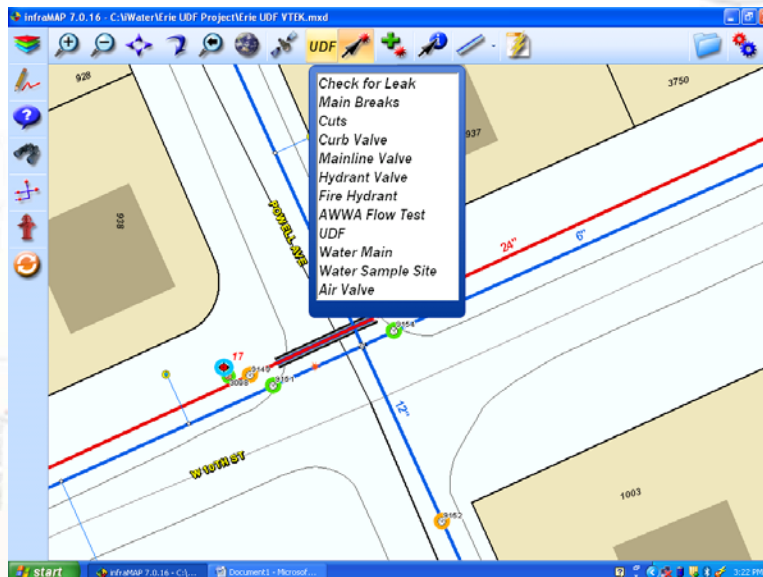


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Trend #5 – Field to Office Interoperability



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Trend #5 – Field to Office Interoperability



Sedarū

**Trace Flow Analysis & Outage Management
Preventative & Predictive Maintenance**

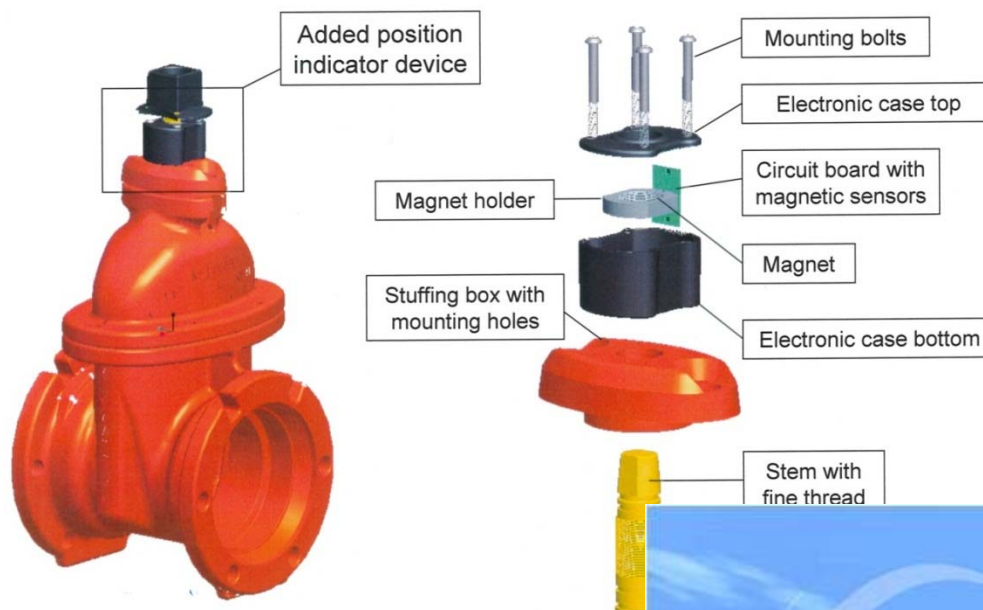
Computer software for analyzing, visualizing and identifying deficiencies in water resource needs and optimizing system performance.

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Trend #6 – Data Automation



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Questions?

Heather Schuchard

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