This presentation premiered at WaterSmart Innovations

watersmartinnovations.com

watersmart
INNOVATIONS

Digital Transformation of CII Water Management:
Real-World Examples, Results and Impacts

From monthly interval data to real-time measurement, analysis, and management

Frank Burns,
Founder APANA, Inc.

Annikki Chamberlain,
Senior Solution Specialist, APANA Inc.

Properties Use Water Outside, Inside and for Cooling

Outside

Inside

Cooling

Refrigeration & HVAC

Problems happen.

They can be expensive, damaging, time consuming and hidden.

Costs are spread out, hard to control, and increasing

Water

Sewer

Energy

Staff Time

Service Provider Fees

Asset damage

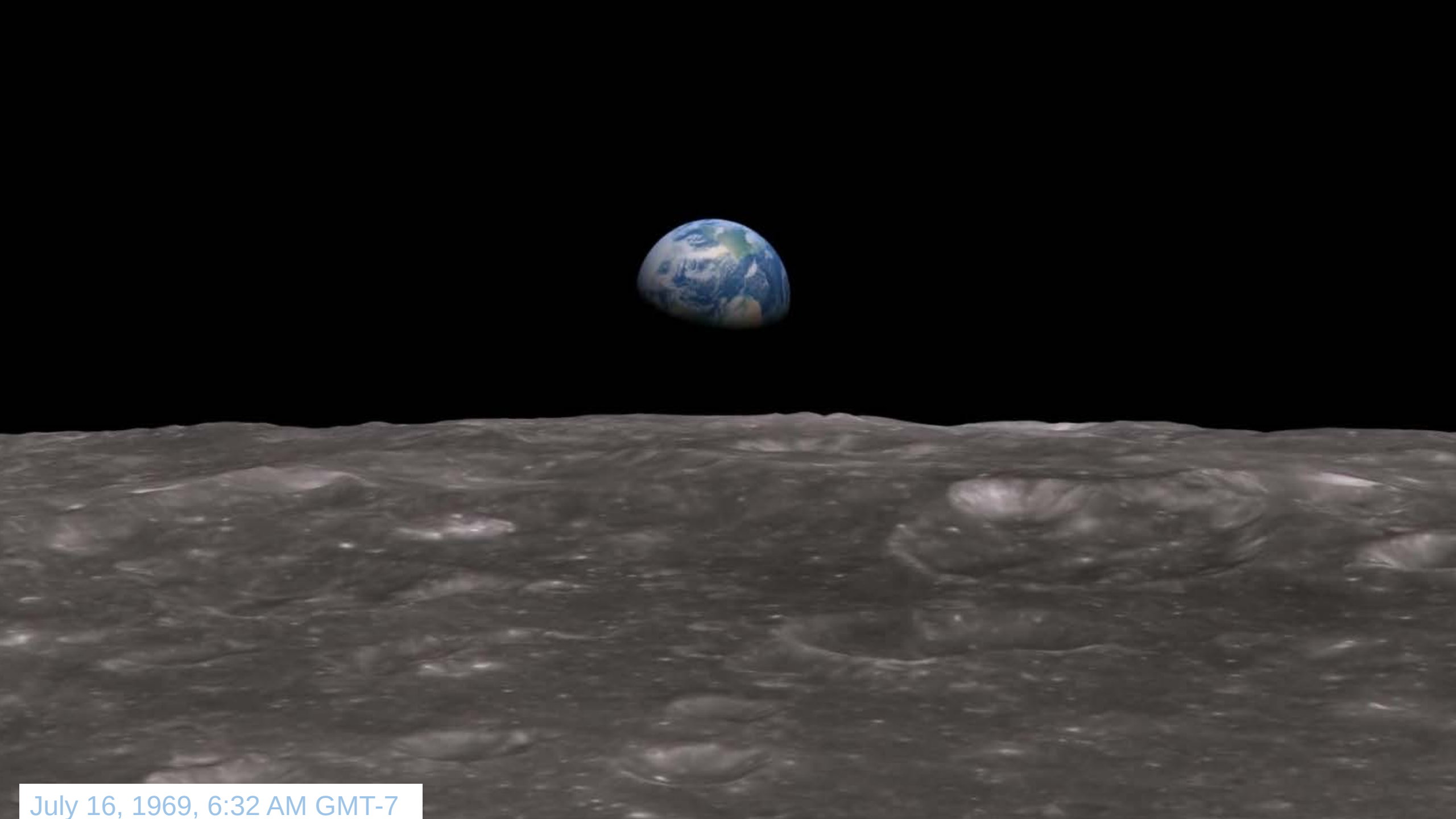
Reputation

Operation insights

Operational Insights

Water touches many cost areas.

Real time water measurement and analysis shines light on the hidden costs.



July 16, 1969, 6:32 AM GMT-7

Digitization

means moving from monthly interval data to real-time water use measurement, analysis, and control.

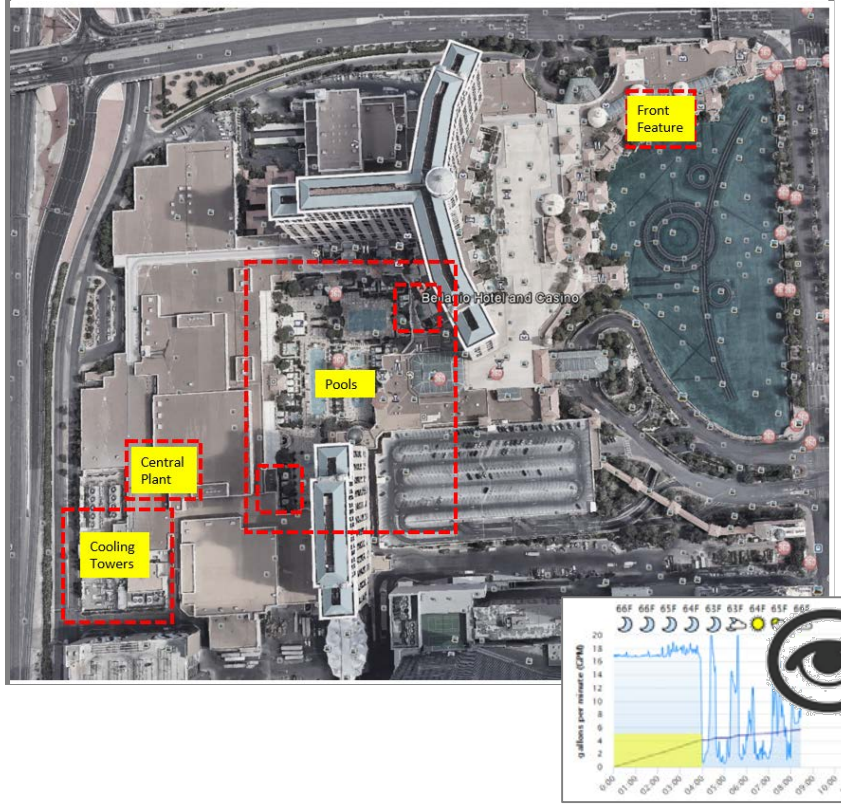
Frank Burns, Founder APANA, Inc.
Annikki Chamberlain, Senior Solution Specialist, APANA Inc.

APANA
Manage Water Like Inventory™

Data driven outcomes - automated

Property Data

Measure & Analyze in Real-time



Data Driven Support

Prescriptive Guidance

- 1st Look
- 2nd Look
- Level 3
- Validation

Insights

Reporting drives results

Real World Examples:

- Real-time water management for CII.
- NREL validation study (National Renewable Energy Laboratory)
- Smart City demonstration projects
  - using City owned meters

Manage Water Like Inventory®

COSTCO WHOLESALE

Fred Meyer

HILTON CURIO A COLLECTION BY HILTON

CITY OF SPOKANE

Harry's FRESH FOODS

Wegmans

BELLAGIO LAS VEGAS

KURITA

FETZER PIONEERS IN SUSTAINABILITY

GILBERT ARIZONA

CAFE ADAGIO

WHOLE FOODS MARKET

AEON 英会話イーオン

Mister CAR WASH

fry's Marketplace

The Chrysalis

Walmart

MGM RESORTS INTERNATIONAL

MT·BAKER

THE HOME DEPOT

WESTERN WASHINGTON UNIVERSITY 1893

U.S. WATER

WYNDHAM HOTELS & RESORTS

LINCOLN PREMIUM POULTRY

Controlling Water Use Has Become Integral To Finding Other Hidden Waste

Costco Initial Goals - Reduce Costs

Results & Benefits

- Reduced water use by 22%
- Avoided other expenses like energy, service provider fees,
- Improved inconsistent operational practices
- Proactively managing maintenance of equipment
- Integrating solution into all new construction to replicate savings & operational efficiencies

FETZER VINEYARDS

Certified B Corporation

WATER STEWARDSHIP AT FETZER VINEYARDS

With water scarcity growing in California, we are committed to pursuing a comprehensive approach to water stewardship that allows us to conserve and reduce water use whenever possible. Since 2015, we have decreased our water intensity by almost 25 percent, from 3.65 to 2.75 gallons of water used in the winery per gallon of wine produced, as a result of using water efficiently and continuing to think outside the box about water stewardship.

This 25 percent reduction comes from a combination of innovative new technologies—we use worms and microbes to efficiently treat our wastewater, and use cloud computing to monitor for water leaks—and ongoing, iterative improvements to our operations. These efforts allowed us to exceed our 2020 water reduction goal by 10 percent, and to do so two years ahead of schedule.

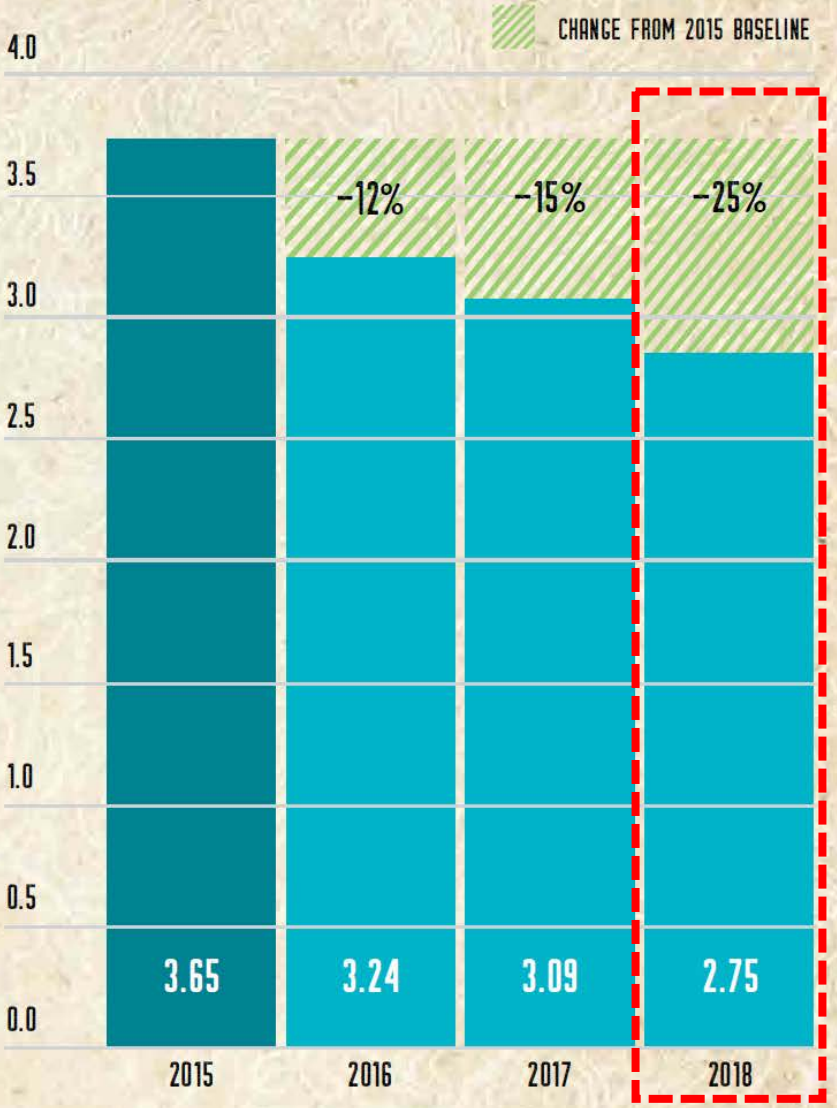
CONSERVING A VITAL RESOURCE

At Fetzer Vineyards, our use of technology is an extension of our mission-driven approach to business, integrating innovative solutions into our operations to help reduce our impacts

In 2016, we began installing more than two dozen smart water meters designed by APANA, Inc. As part of APANA's Industrial Internet of Things solution, the smart water meters and associated technology use data analytics to track our water-use patterns in real time, allowing us to quickly spot variances and identify savings opportunities. In the event of an equipment malfunction, the smart technology also enables us to pinpoint and correct the problem before significant water volumes are lost.

A variety of other operational initiatives contributed to our reduced water footprint, including the installation of waterless urinals and the ongoing use of peracetic acid in the winery, which eliminates the need for a second rinse during sanitation. Using worms and microbes in our BioFiltro BIDA® System for wastewater treatment is more energy-efficient than earlier wastewater treatment technology, and upgrades to our centrifuge system to recirculate cooling water reduce the water required during a key winemaking process. And finally, our new bottling lines installed in 2017—which increase efficiency and packaging flexibility—came with a secondary benefit of reducing the water volume required for sanitation processes.

WINERY WATER INTENSITY OVER TIME



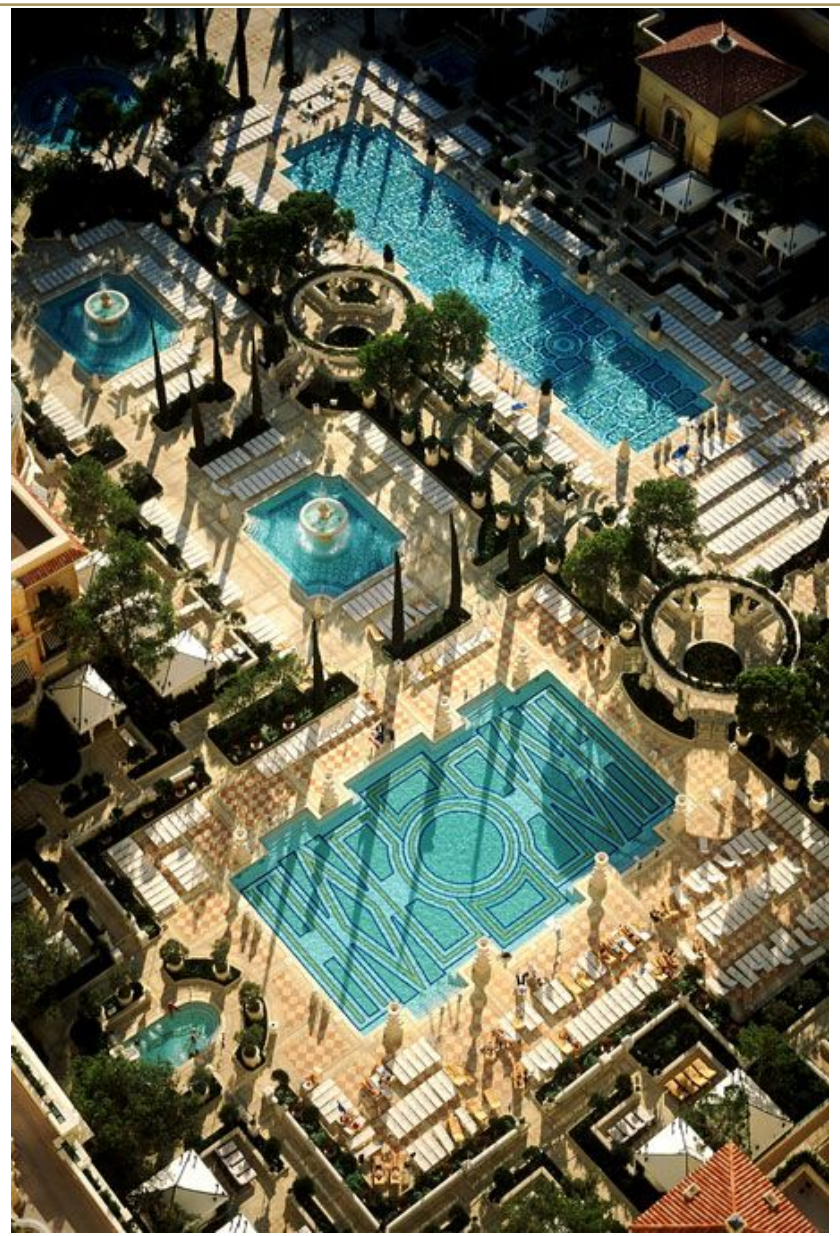
Water intensity figures represented as gallons of water used per gallon of wine produced.

BELLAGIO®
LAS VEGAS

Intelligent Water Management - APANA

RESULTS SUMMARY

- Identified operational process improvements, provided real-time notifications
- Reduced pool water consumption by almost 14,400 gallons per day (37%)
- Resulting annual savings from reduced heating requirements: 900 MMBtu
- Embedded system energy savings: over 35,000 kWh
- Hot water loops have high baseload usage – further investigation needed



MGM RESORTS INTERNATIONAL™

waterstart
channels for innovation

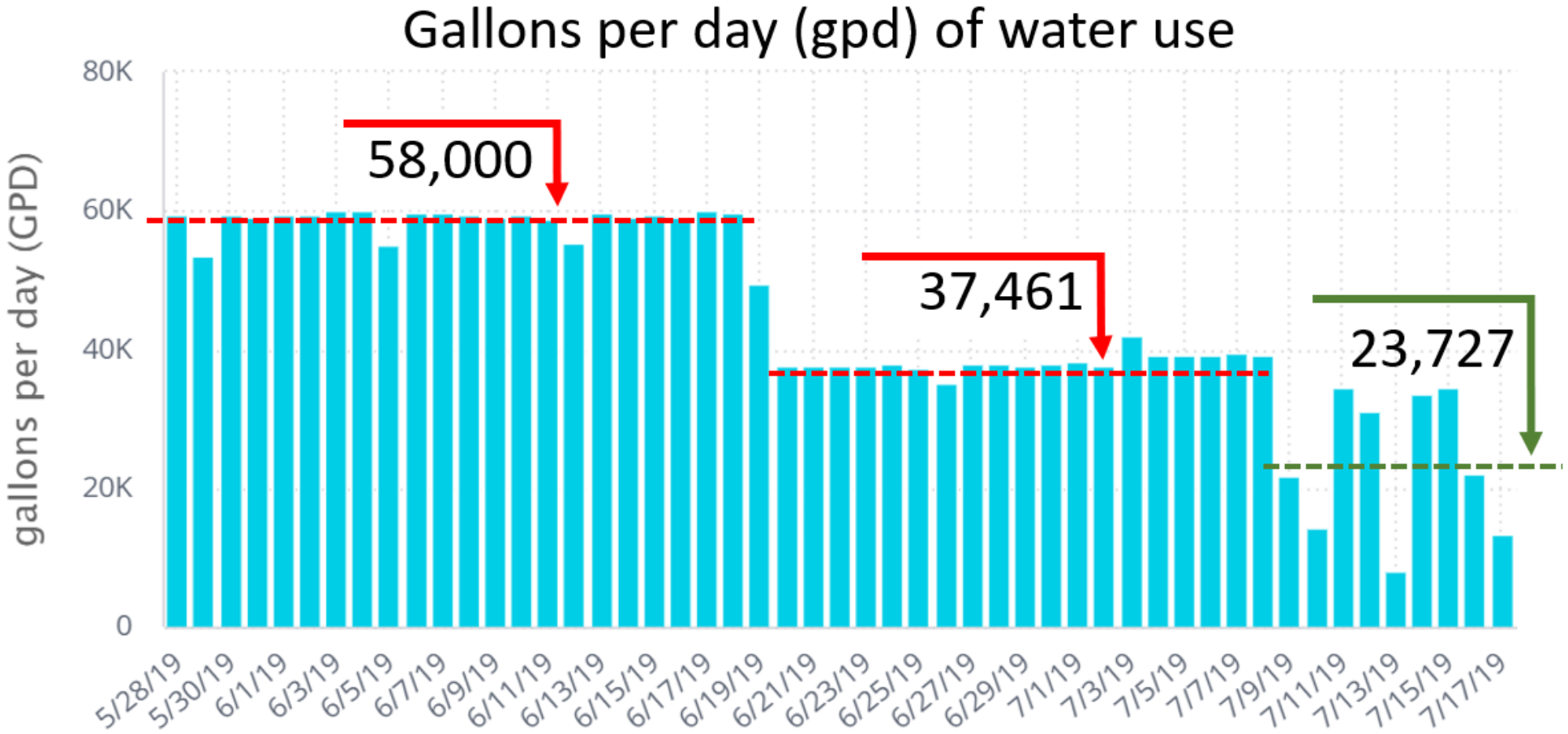
Winner 2019

IDC ANALYZE THE FUTURE

Congratulations to the City of Spokane, Washington's Urbanova Project
Winner in the Sustainable Infrastructure Category
IDC Smart City North America 2018 Awards

Spokane: landscape water use example

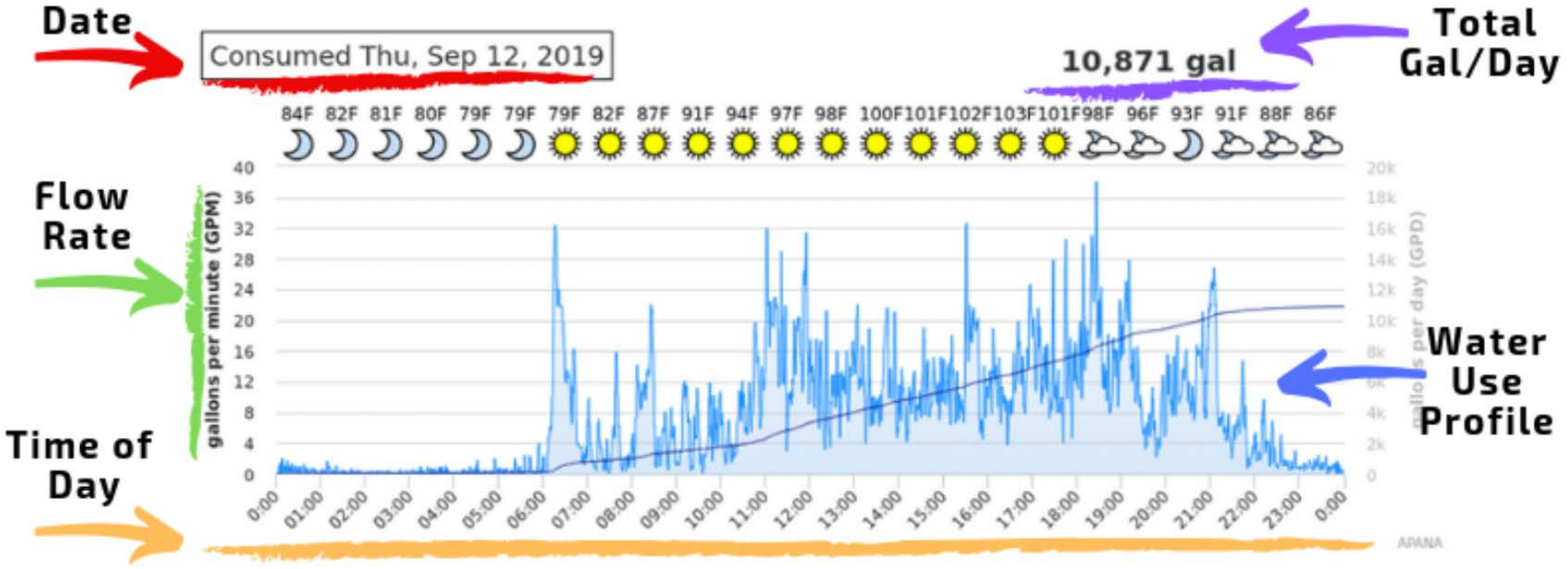
Data driven prescriptive guidance result



60% save

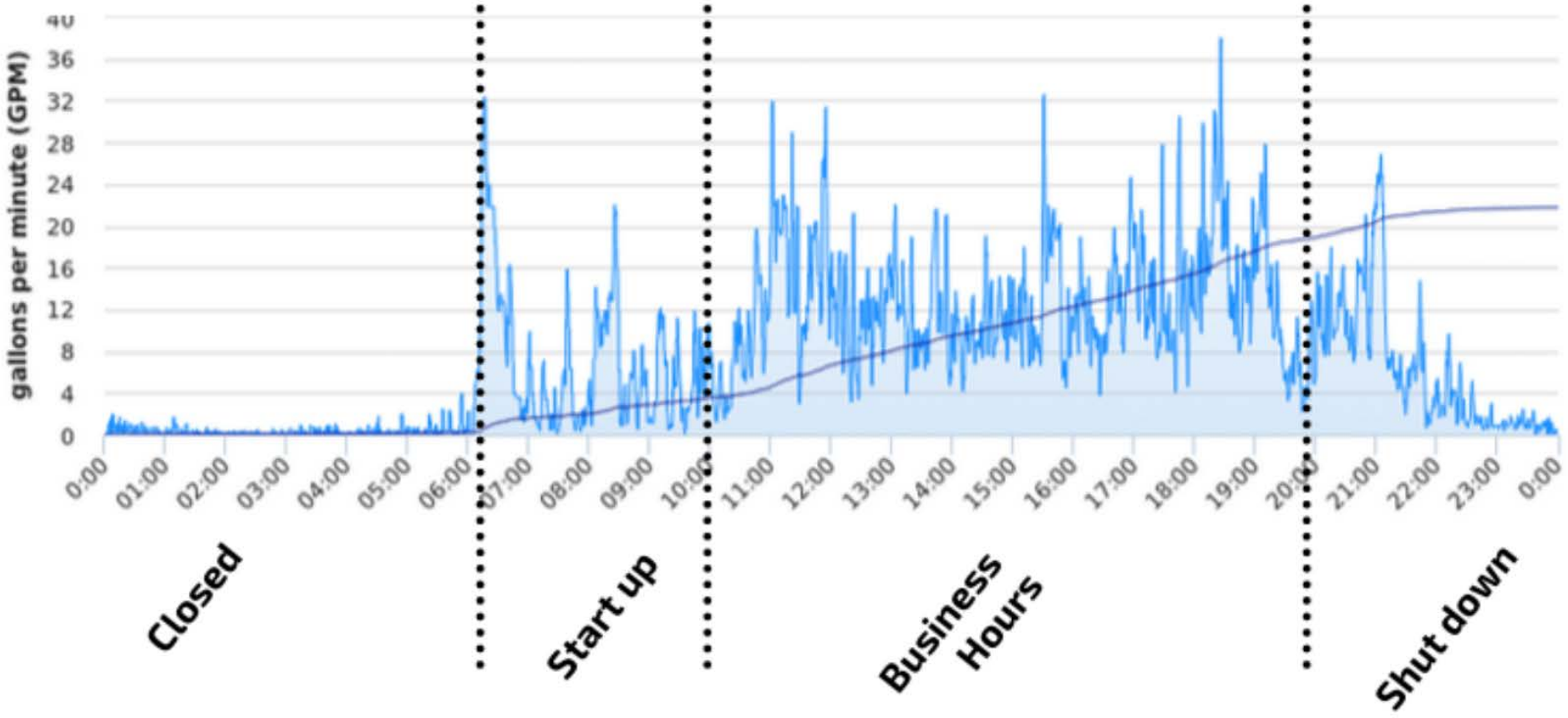
The Water Use Profile

APANA monitors water use like a doctor monitors a heartbeat.
This data, graphed over a day, creates your Water Use Profile.



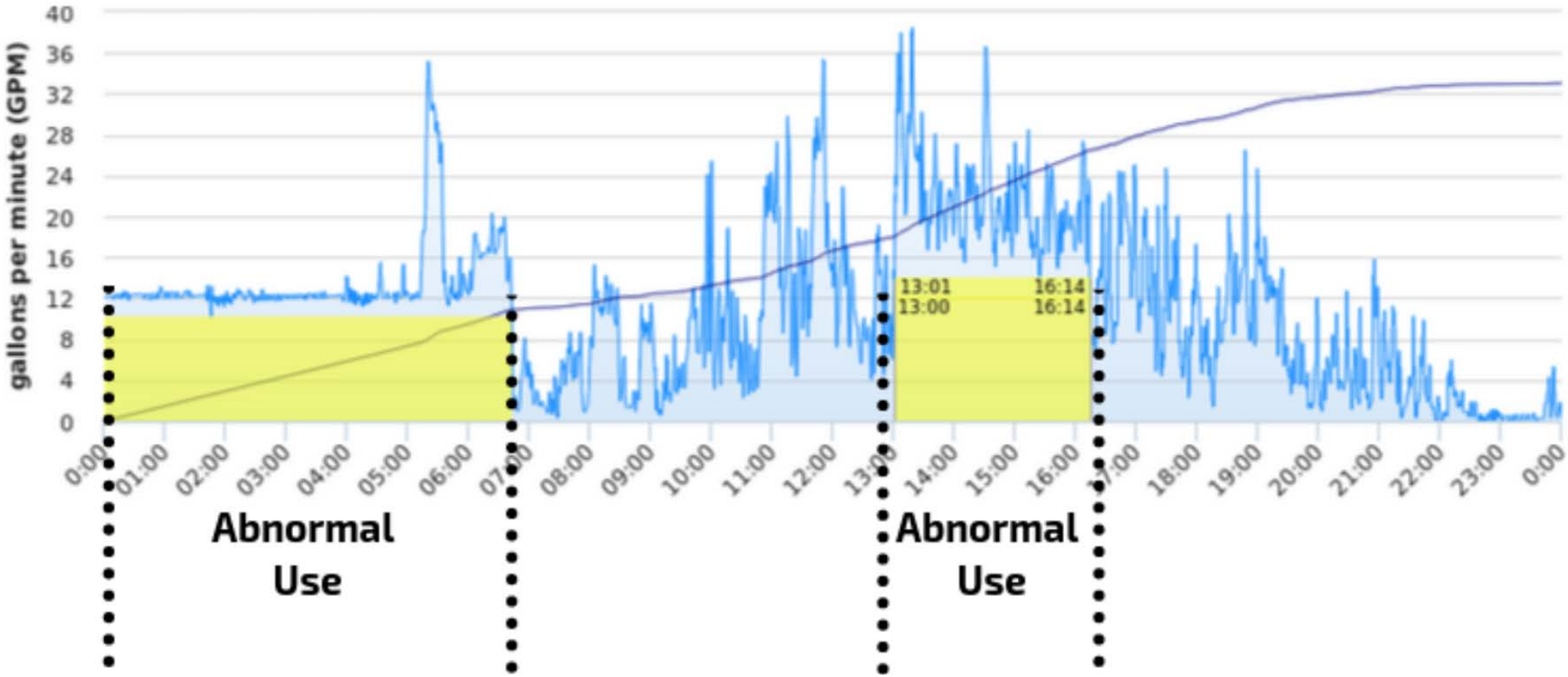
Reading the Profile

The *Water Use Profile* shows the operational performance of the building.
Compare the actual use to what you expect for the time of day, and you will see things..



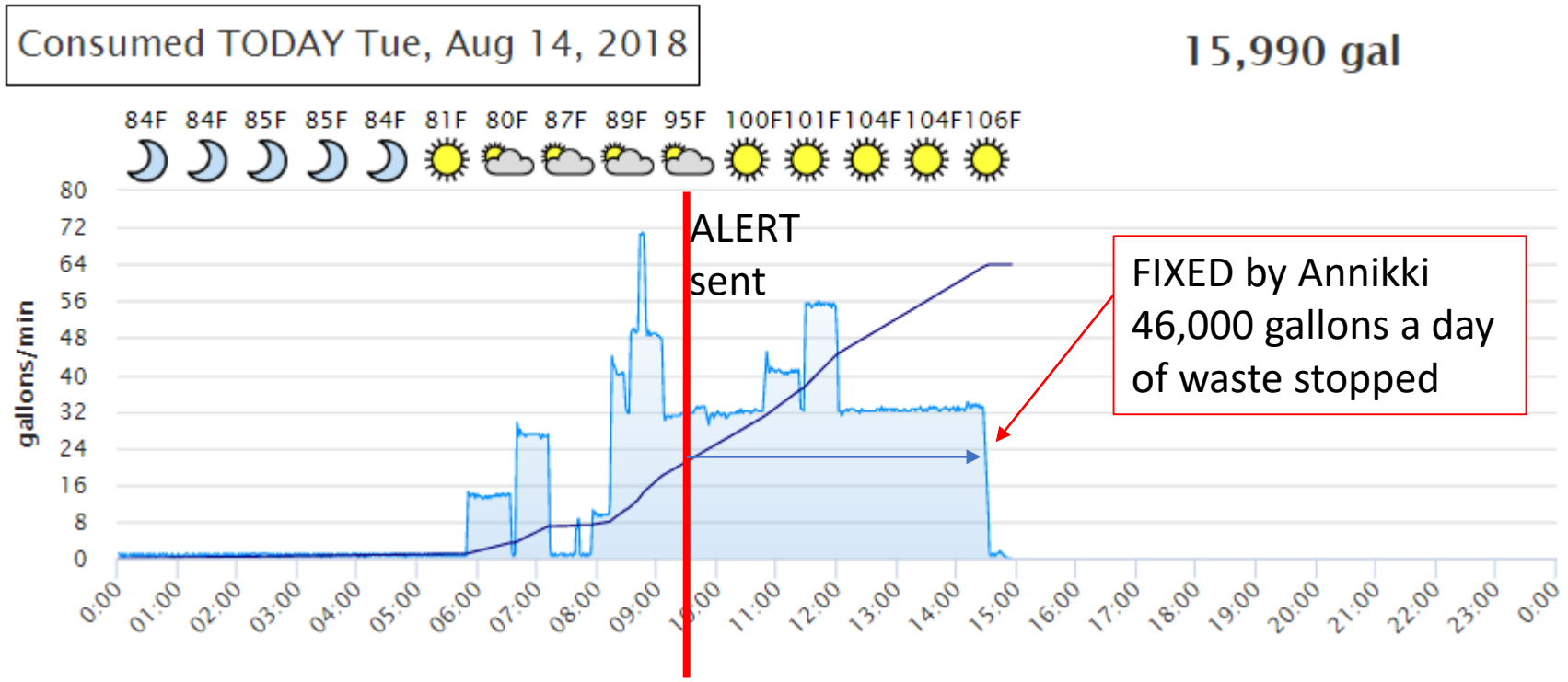
Seeing Waste

If the water use does not make sense given the time of day, it is probably waste.



Landscape Module - AZ

City Demonstration Project



Stopped a 32 gal/min (46,000 gal/day) event inside of commercial irrigation system. This one would have run for days.

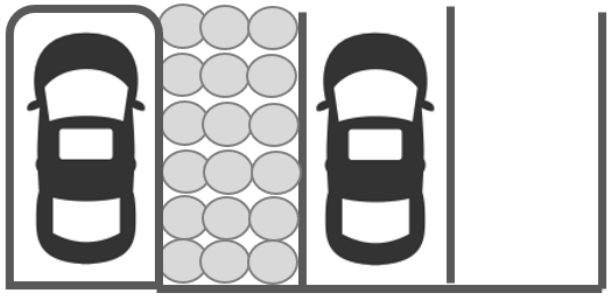
Landscape Module - AZ

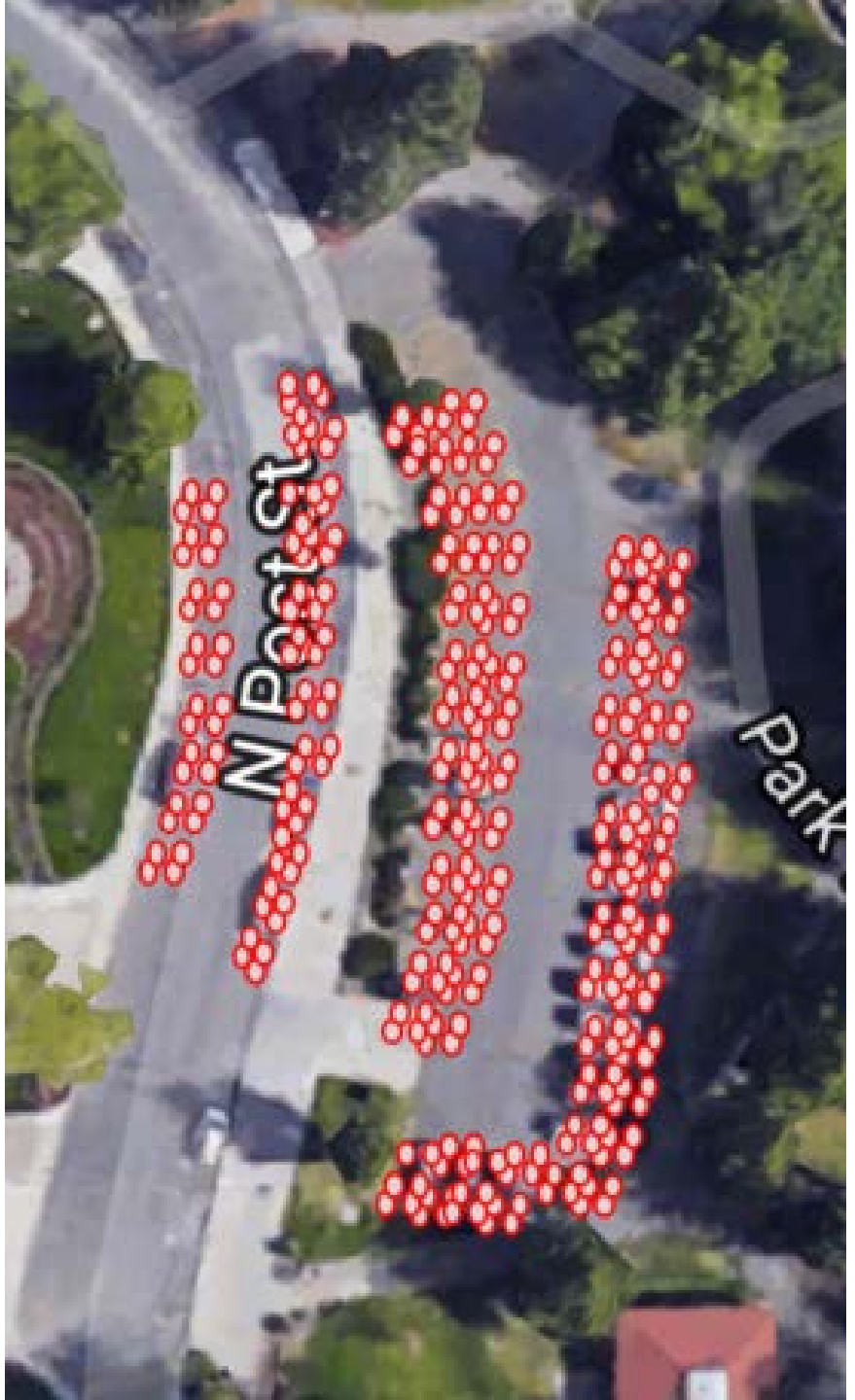
Landscape Module - AZ

46,000
gallons/ day

920

50+



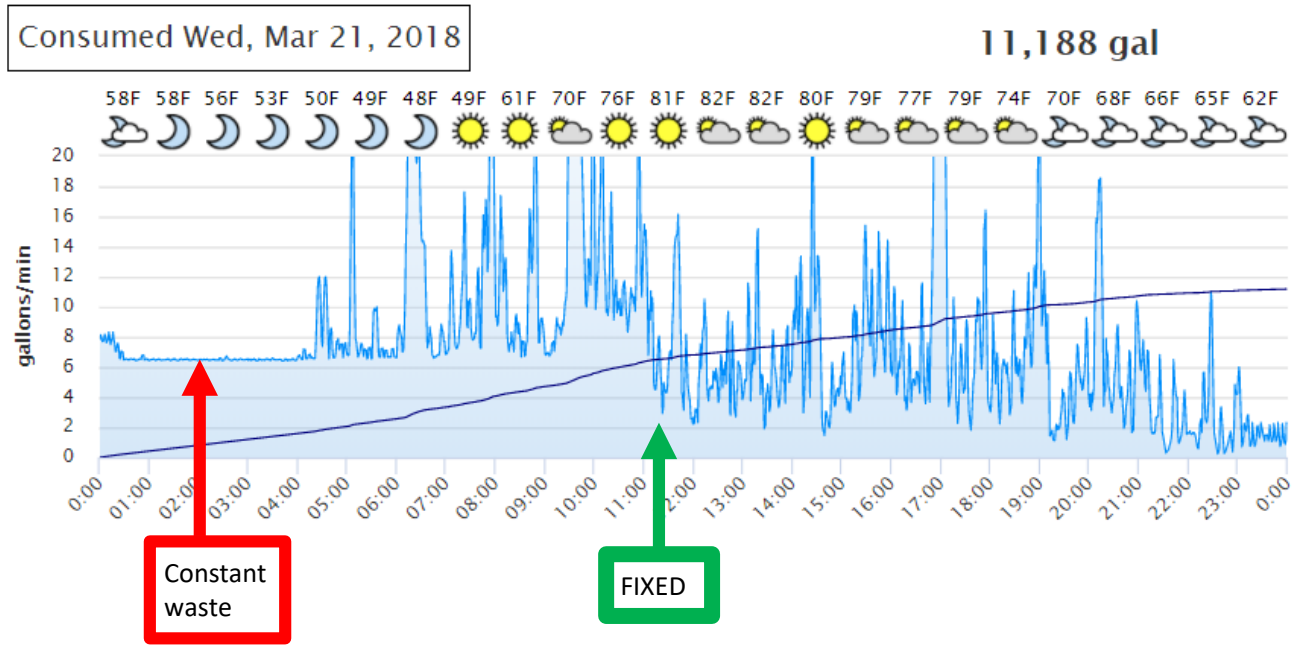


Building Module

8,500 gal/day Hot Water Leak

Location alerted and guided to find a pressure relief valve discharging 6 gal/min of hot water into a hidden drain in a mechanical room.

Plumber fixed the problem quickly.
Water, Sewer and energy saved.



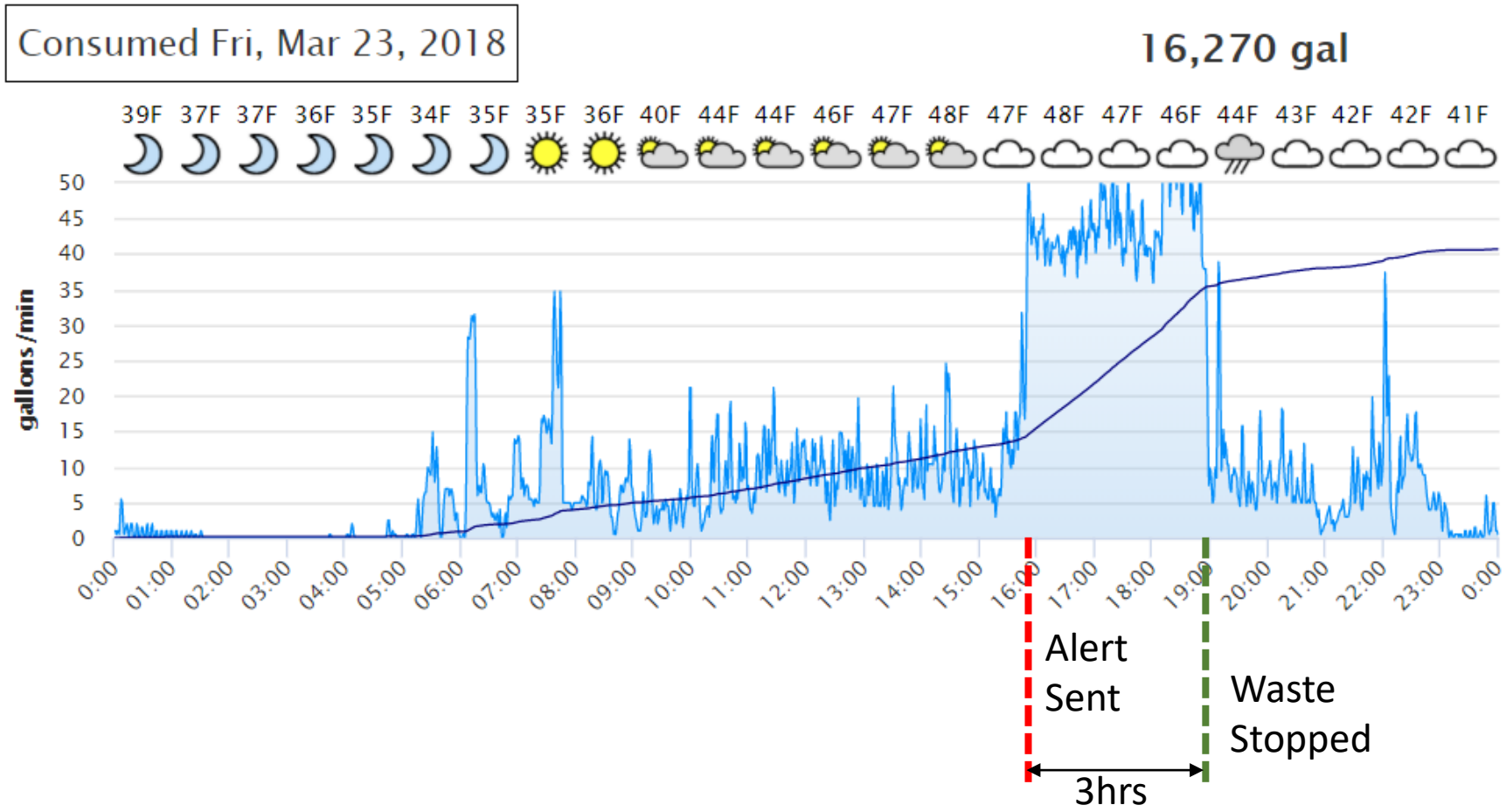
Building Module

50,000 gal/day waste event

EVENT

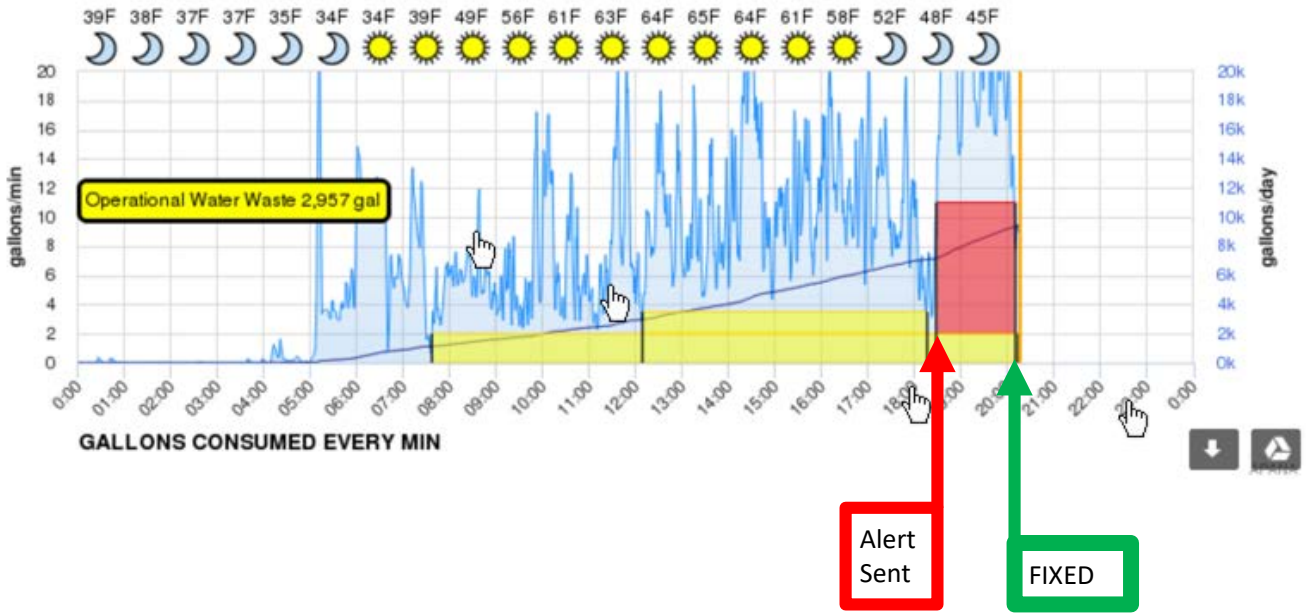
Hidden toilet failure.

MINUTE BY MINUTE WATER USE PROFILE

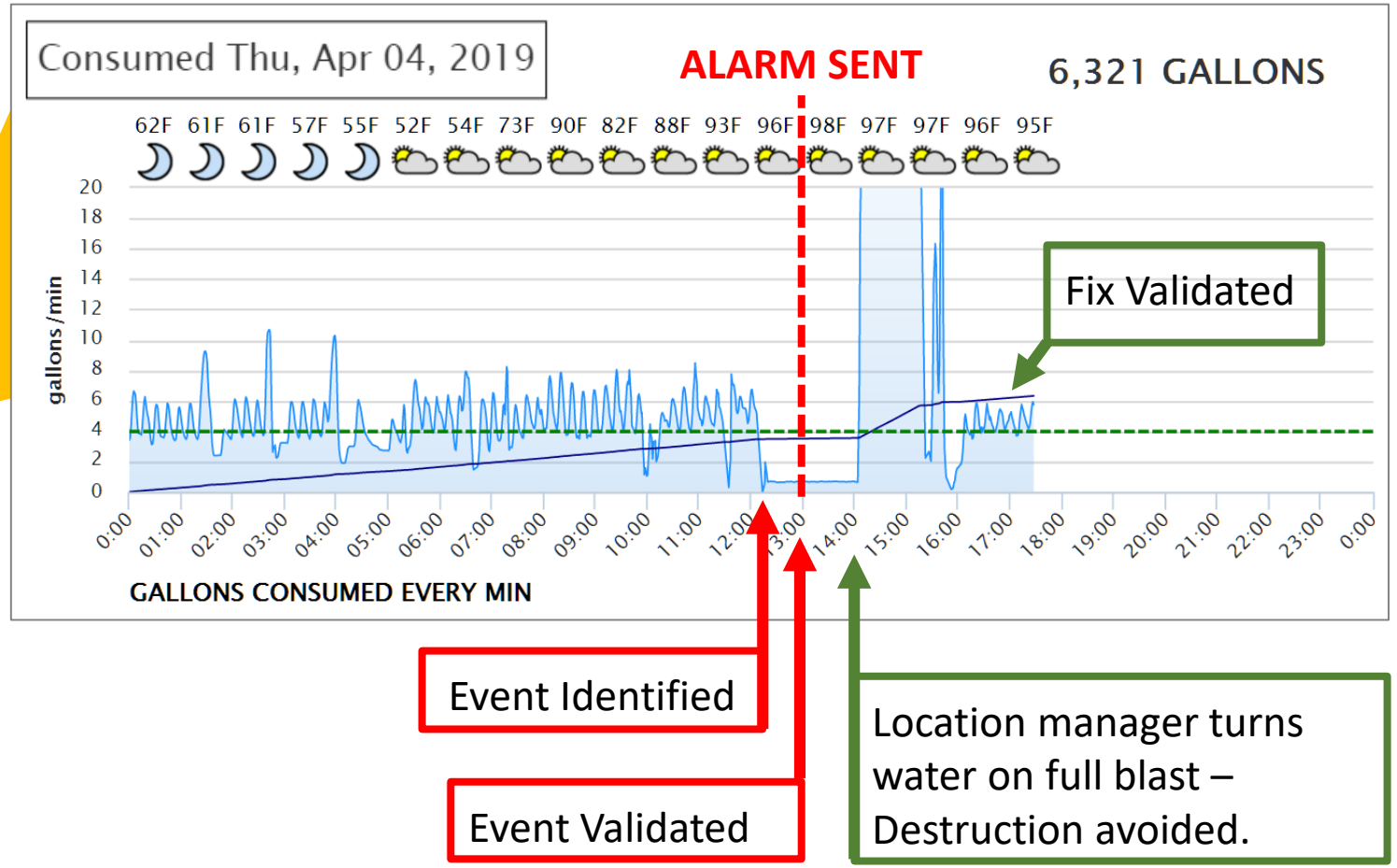


Operational Waste

Alerted and stopped



Why one-minute interval data?



Prescriptive Guidance
Via AUTOMATED ALERTS

High Risk: Extreme Water Use Detected: redacted #166640 Inbox ×

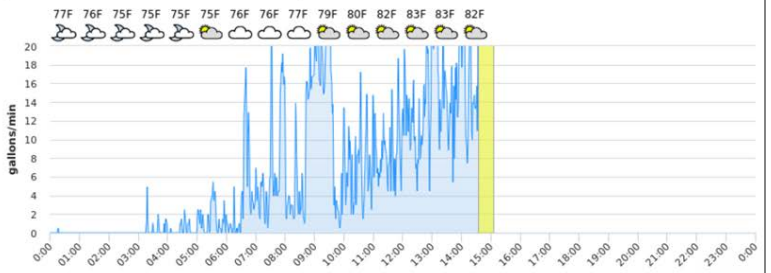
APANA Waste Detect

Redacted email list for confidentiality

Action: Use the First Look Guidance below to locate broken pipes or equipment failures flowing at the rate of 2 or more garden hoses.

Issue: The yellow highlight in the water use "fingerprint" below shows the time and abnormal use detail for this event.

Consumed TODAY Sun, Jul 07, 2019 **7,069 gal**



Click Here to see an updated water use fingerprint.

If you have completed all the steps in the First Look Guidance below and cannot find the issue, please reply to this email for Second Look Guidance.

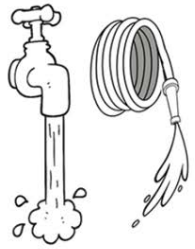
Best Regards,
APANA Support

First Look Guidance

Step 1:

Review items below for signs of a LARGE **steady** water flow.

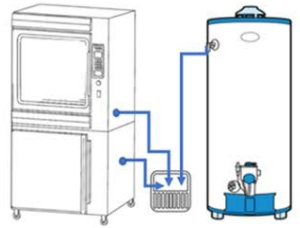
Flowing hoses and faucets



Toilets and urinals

Floor drains near equipment & mechanical areas

- Look for water running out of pipes into drains.



NOTE: Drains can be hidden behind equipment.

TIP:

- Look on the roof and in equipment areas

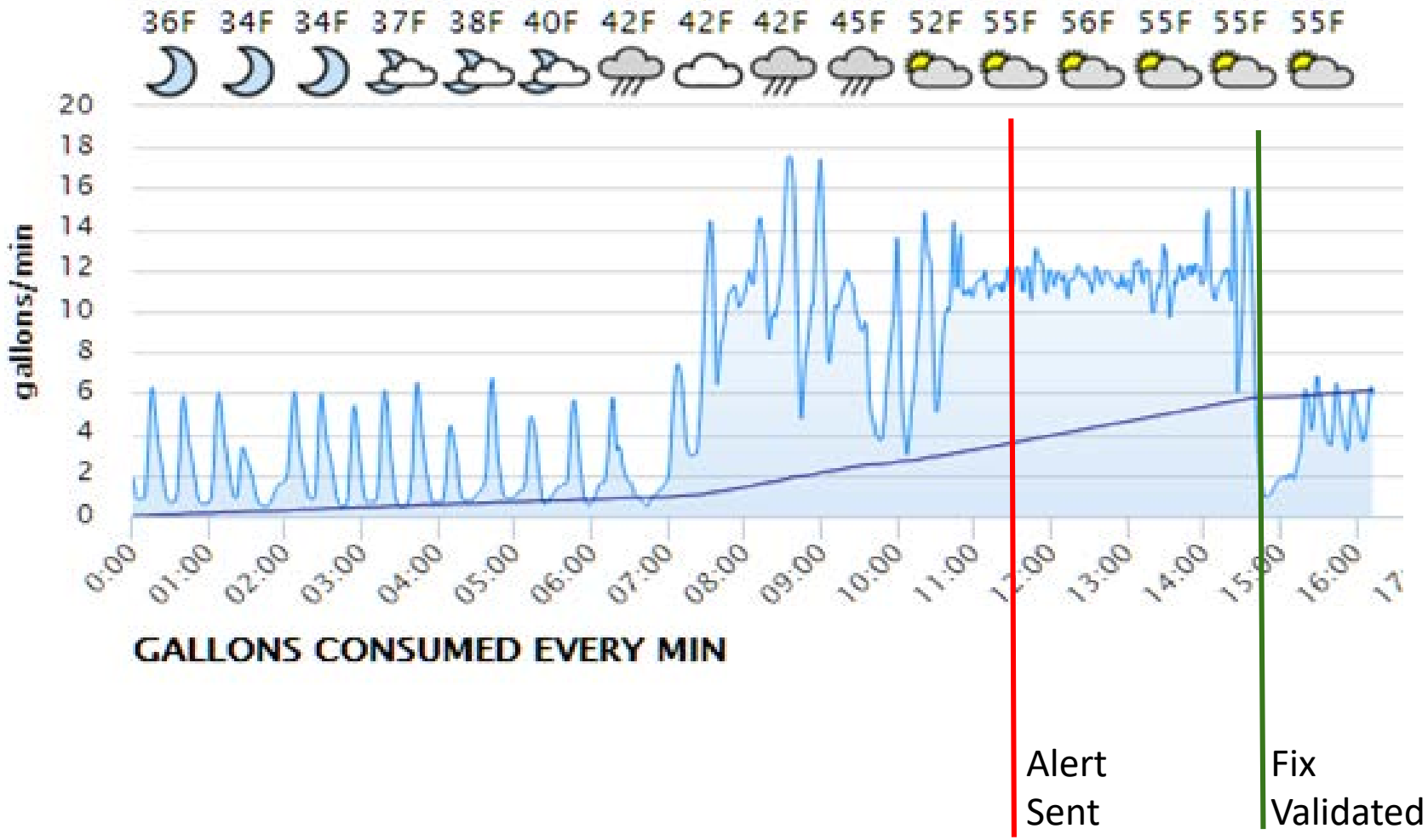
Example Map:

Areas typically having floor drains are marked with icon in the map below.

Cooling Tower Failure (evaporative condenser)

Mech/ Electrical:

Cooling Tower Waste Event 11,500 gal/day



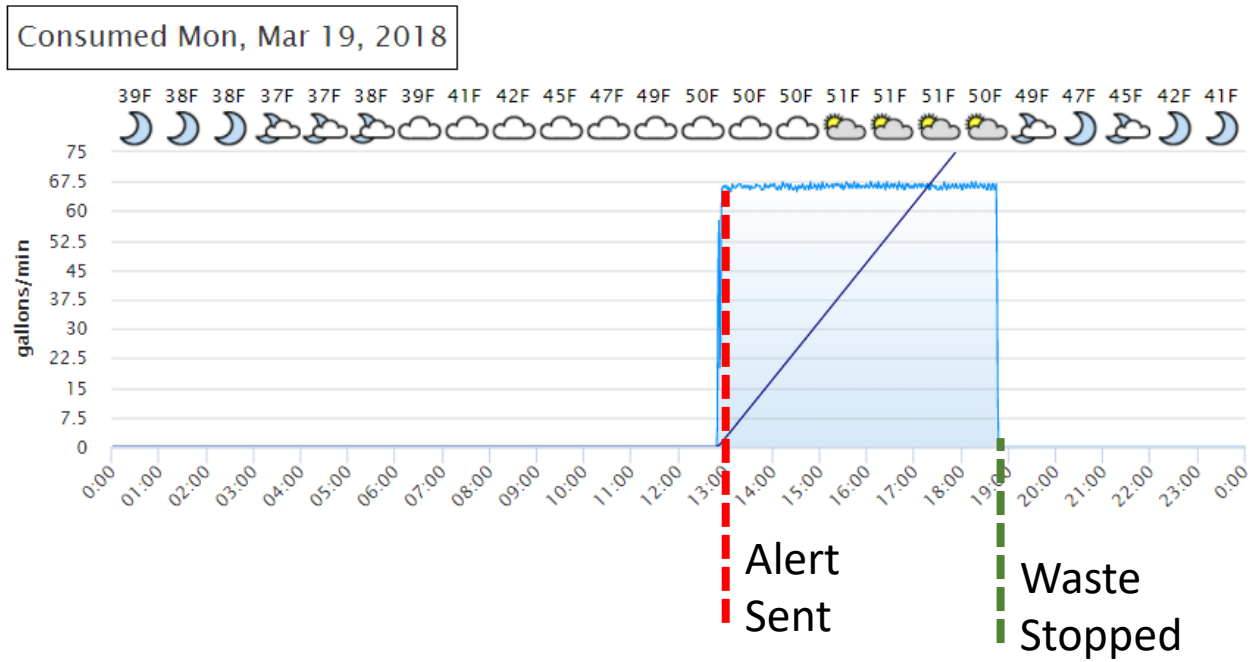
93,000 gal/day Contractor Error

“they were just here, everything is fine”

Location Manager, 13:35

“this would have run all month”

Location Manager, 19:20



NREL
NATIONAL RENEWABLE ENERGY LABORATORY

Field Validation Study Results

Walmart Loveland, CO

IN²

FOUNDED BY: WELLS FARGO | NREL

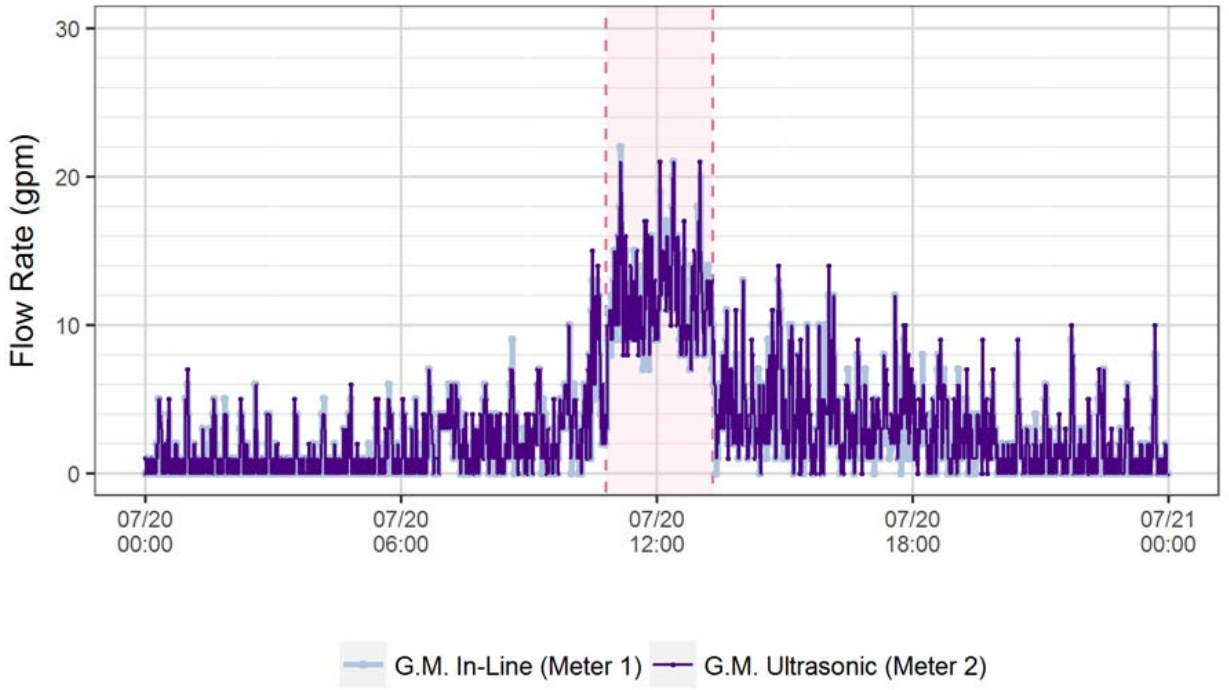
Task 2: Field Validation

3. Validate APANA system response to an abnormal water event
   - The APANA system correctly captured and reported several real excessive water use events during the test period and provided direction to WalMart management for correcting the faults

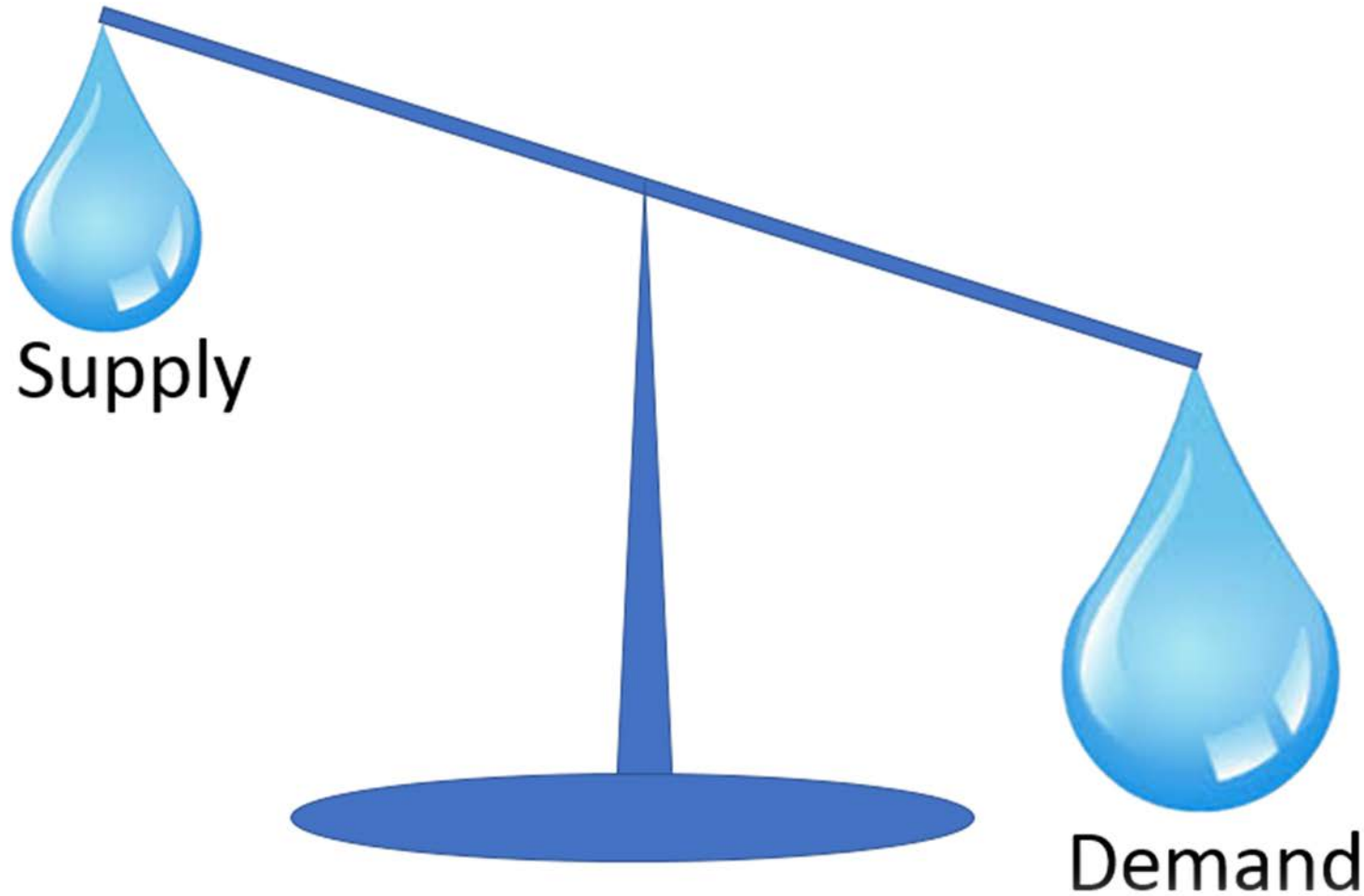
- Manual operation of the portable evaporative cooler resulted in multiple high (3-8 gpm) water events and the APANA system quickly notified the WalMart staff during each event

Task 2: Field Validation

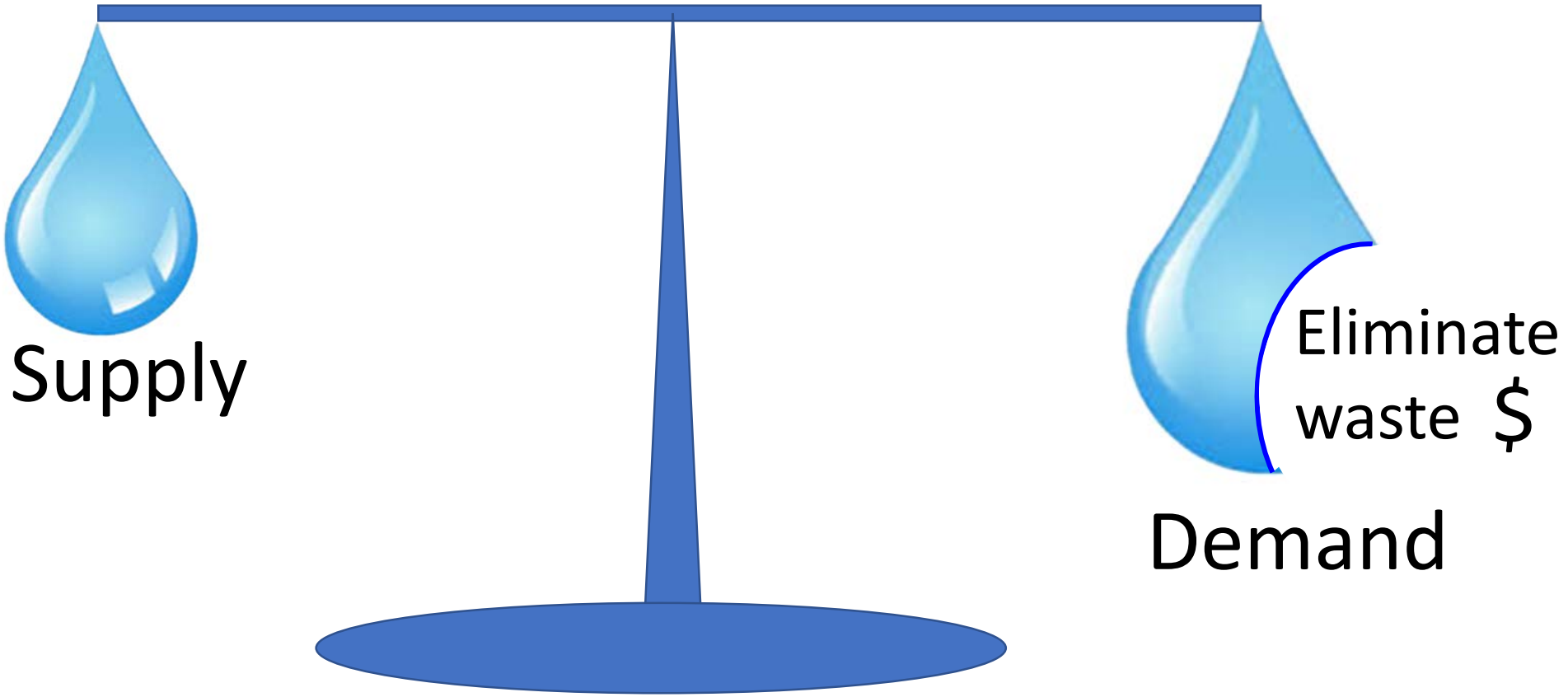
3. Validate APANA system response to an abnormal water event
   - NREL simulated a large leak in the auto center
   - APANA correctly identified an reported the event



How to solve the water crisis?



How to make more water



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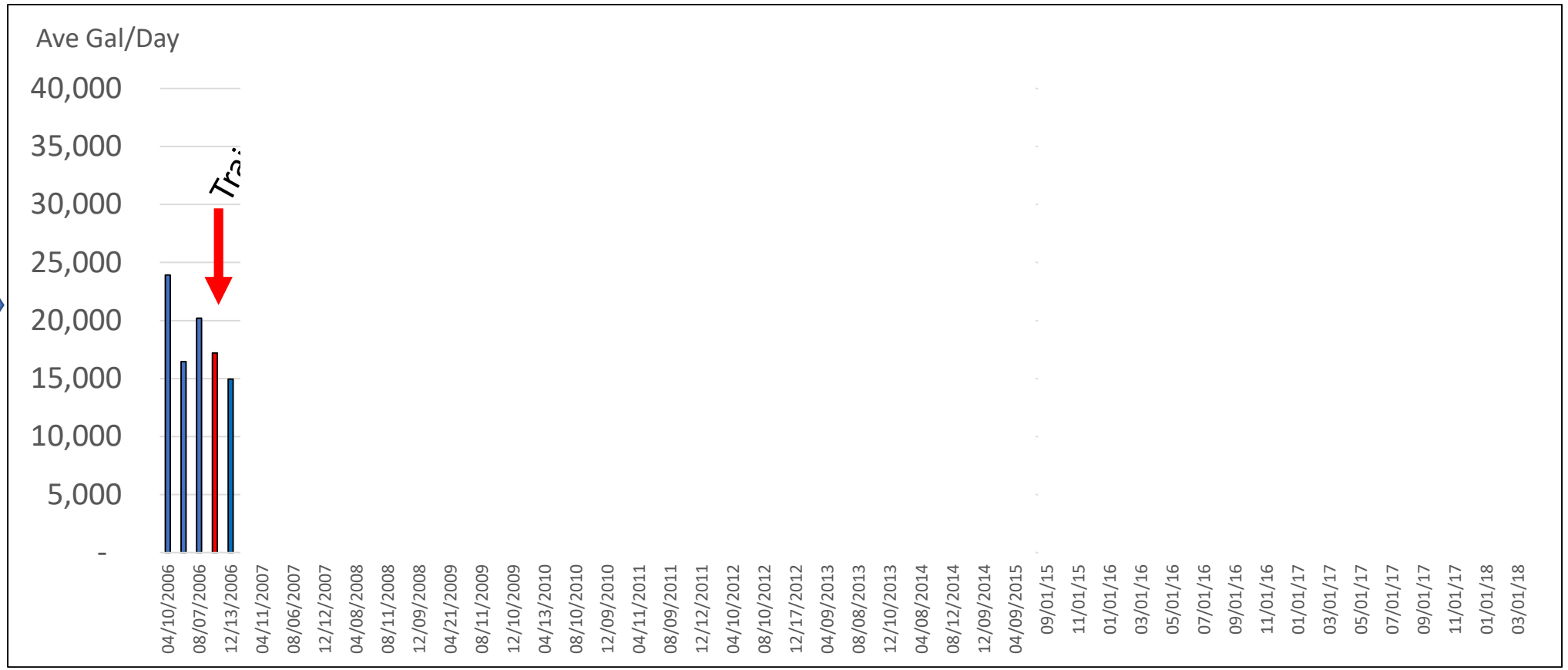
PROBLEM

STUDY
50+page
Report



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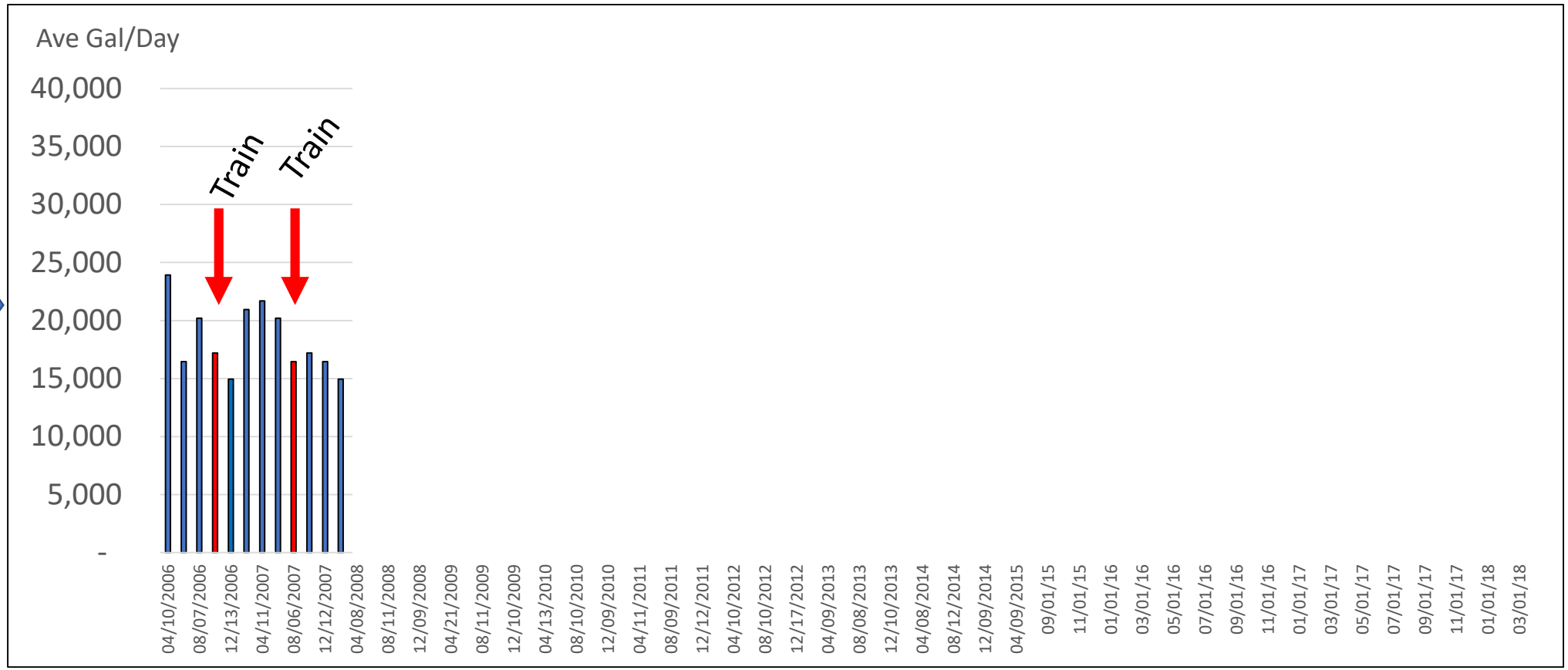

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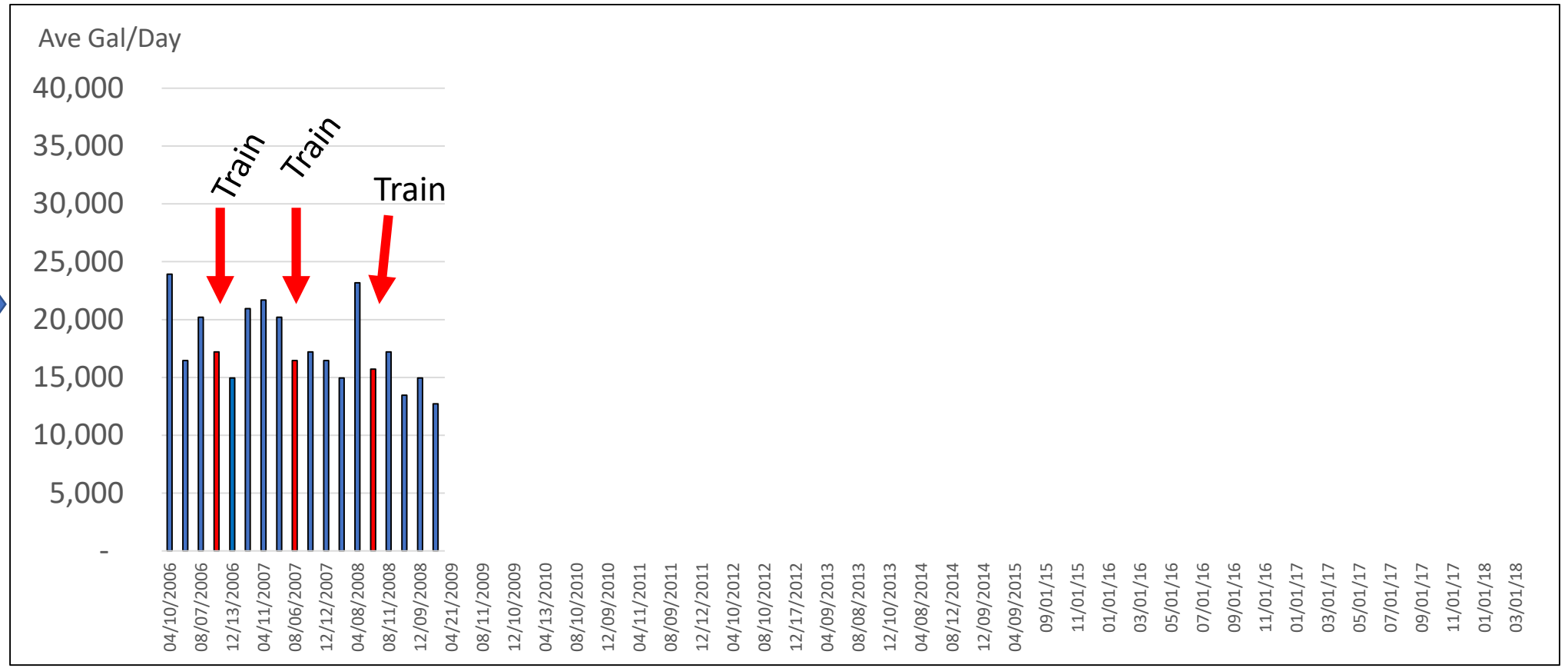

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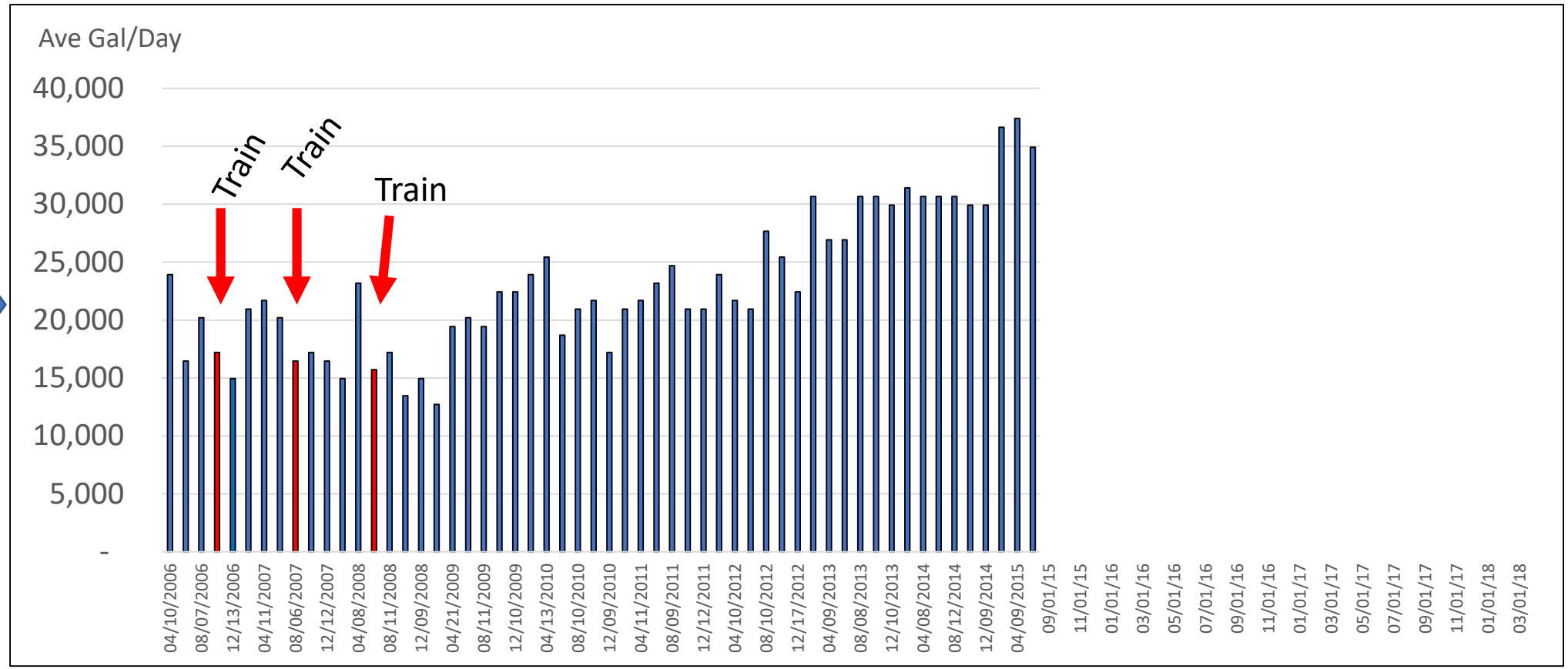

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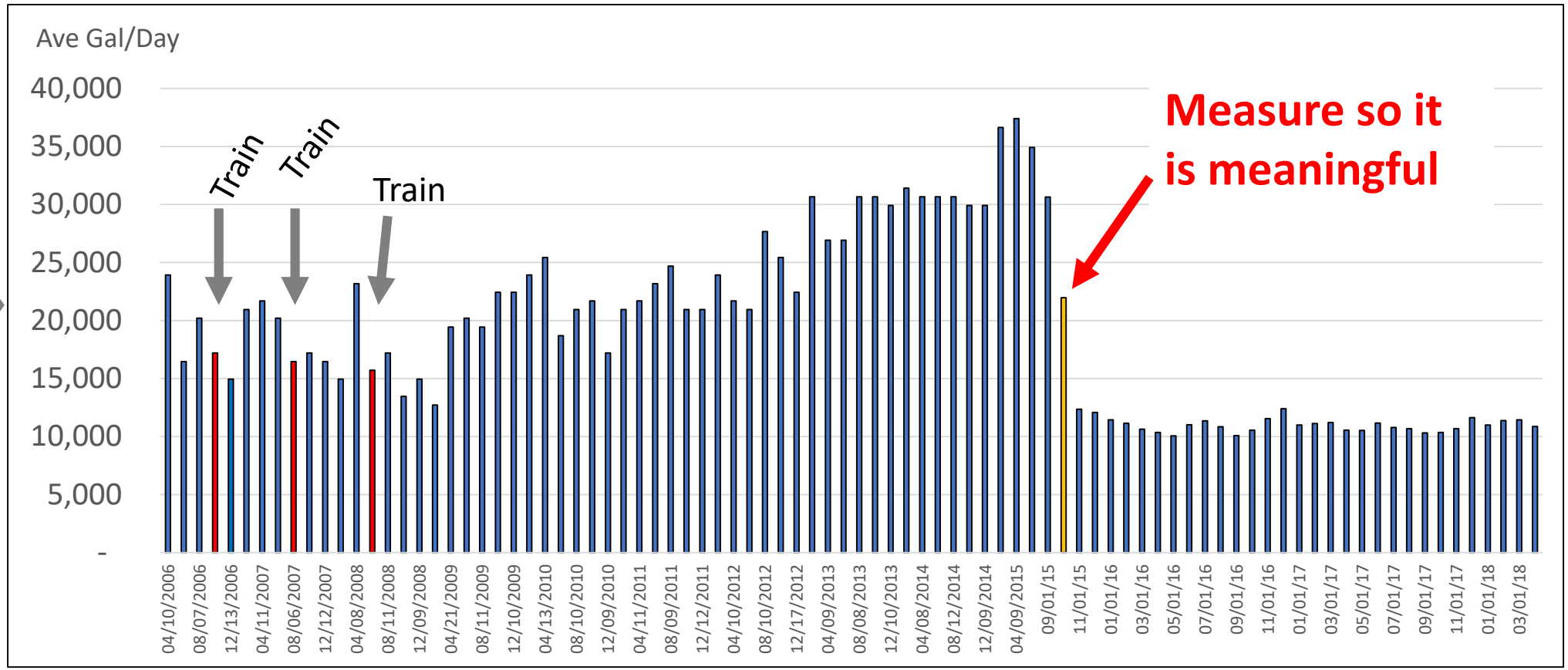

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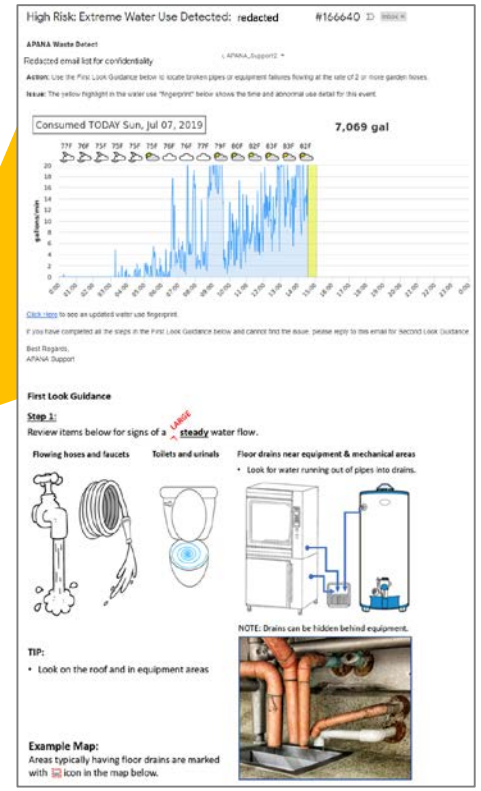
AMI Data or Real Time Data



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APANA
Intelligent Water Management Platform™

Thank you

Digitization

means moving from monthly interval data to real-time water use measurement, analysis, and control.

Frank Burns, Founder APANA, Inc.
Annikki Chamberlain, Senior Solution Specialist, APANA Inc.

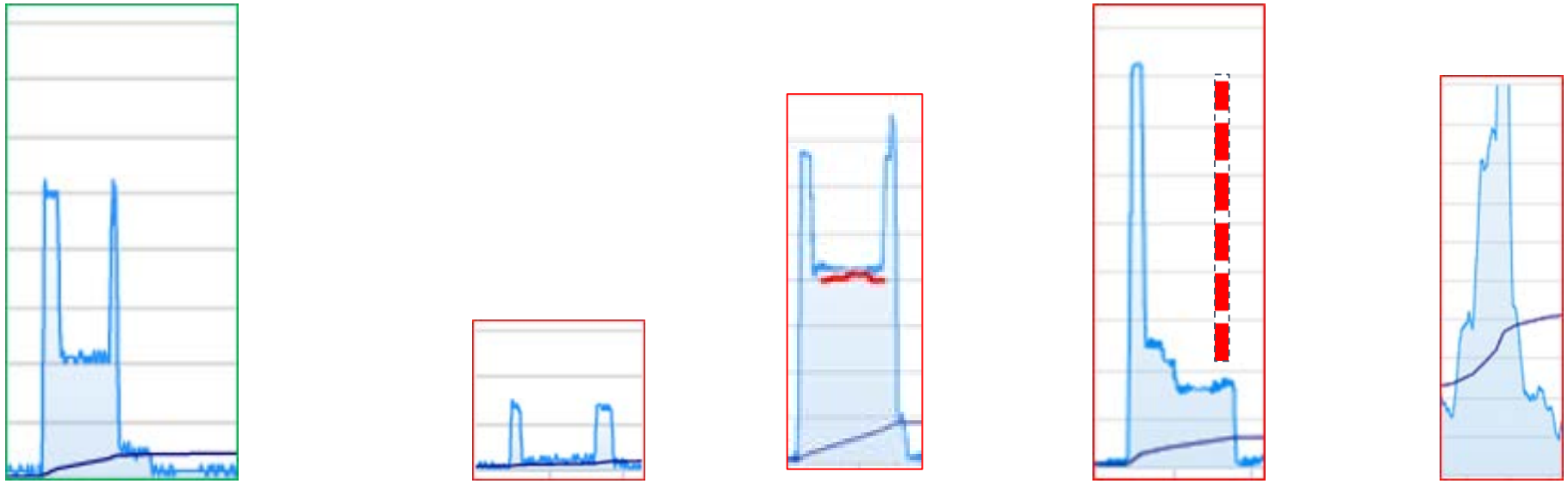
APANA
Manage Water Like Inventory™

AROUND-THE-CLOCK VISIBILITY

Water Softener Regeneration Cycle Example

HEALTHY

FAILURE



Backwash Rinse Brine

No Brine

Too Much Brine

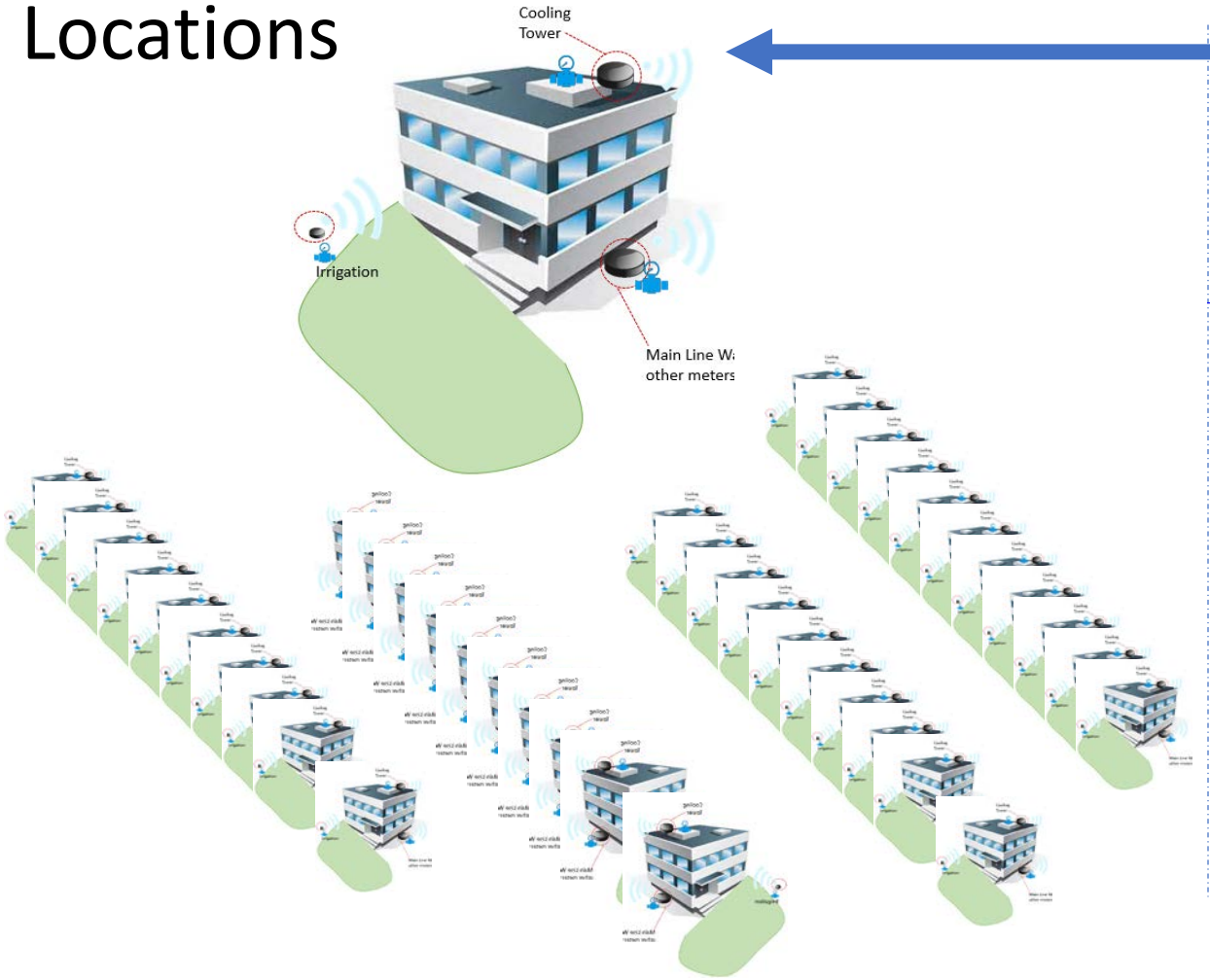
No Rinse

Total Fail

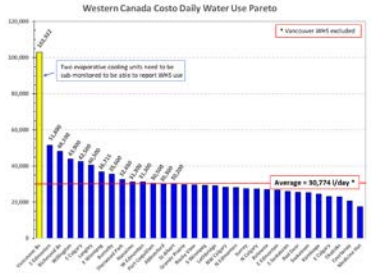
Digitization

Enterprise/ City Scale Insights and function

Locations



Executives

Reporting	Business Intelligence	Executive KPI's
		
		Normalize Drive performance Regulate

About APANA

APANA® is the inventor of the Intelligent Water Management Platform™

APANA® automates real-time water use measurement and analysis

Delivers cost control and operational insights for properties, campuses, and organizations.

NREL Validated 2019.

Commercial water and wastewater domain experts since 1994.

APANA.com

Winner
IoT World Awards 2019