EAST BAY MUNICIPAL UTILITY DISTRICT

EBMUD's Landscape Advisory Committee General Meeting

Irrigation Talk – Tips and Resources

June 14, 2021

Kristin Bowman, EBMUD Water Conservation Representative
Luke Sires, EBMUD Water Conservation Representative
Christine Hawkins, Hunter Industries

Announcements

New Rebates – July 2021

- "Super rebate" pilot $1.50/sf - compost, sheet mulch, 50% CA natives, not planted in the summer. (residential and commercial)
- Commercial median strips pilot $1.50/sf – standard lawn conversion

Mulch and compost coupons: renewed (ebmud.com/watersmart)

New Resources

- Lawn and Landscape Watering Schedule (English and Spanish)
- Videos available: Irrigation Basics (English and Spanish, Getting Started with Water Wise Gardening, Graywater: Laundry to Landscape, Rainwater Catchment, Plant Selection for Beginners, Grow Your Nursery With Low Water Native Plants)

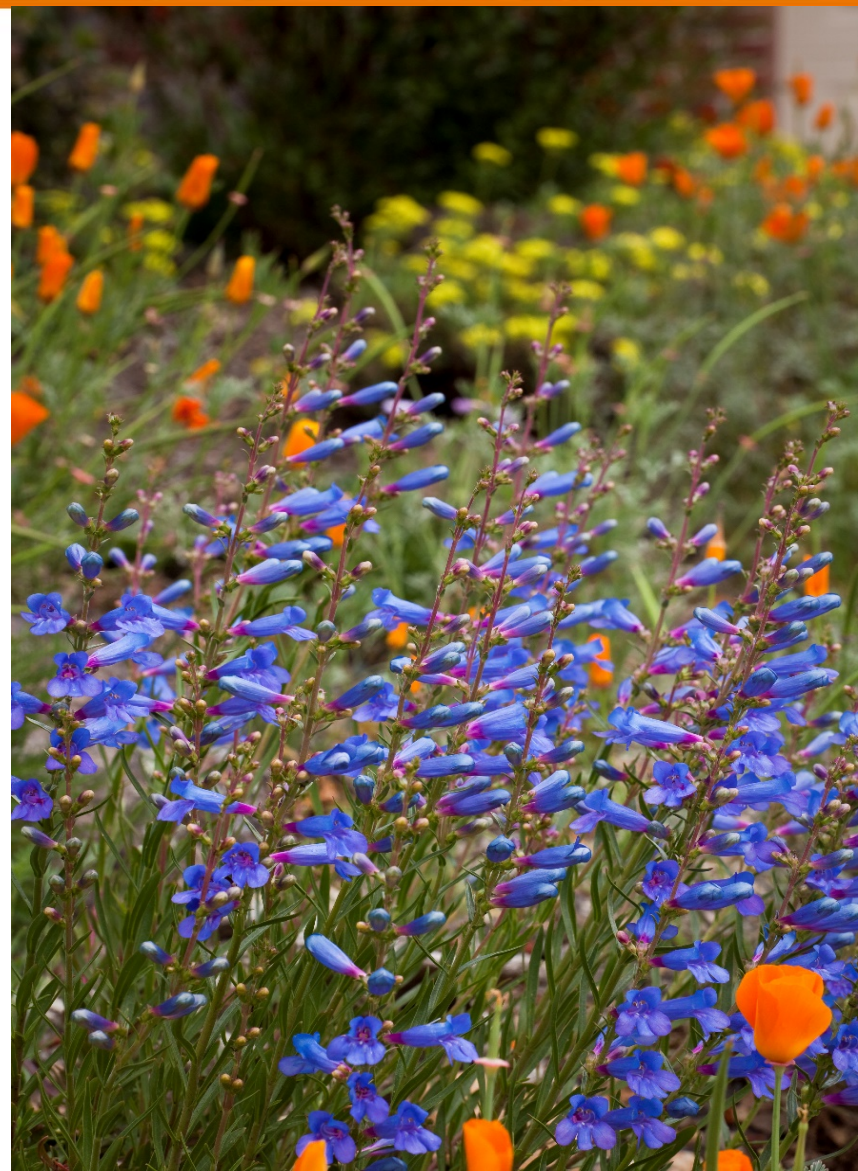
Rate Increase

- 4% water and 4% wastewater in FY22 and FY23 effective July 1, 2021.

CEUS's available

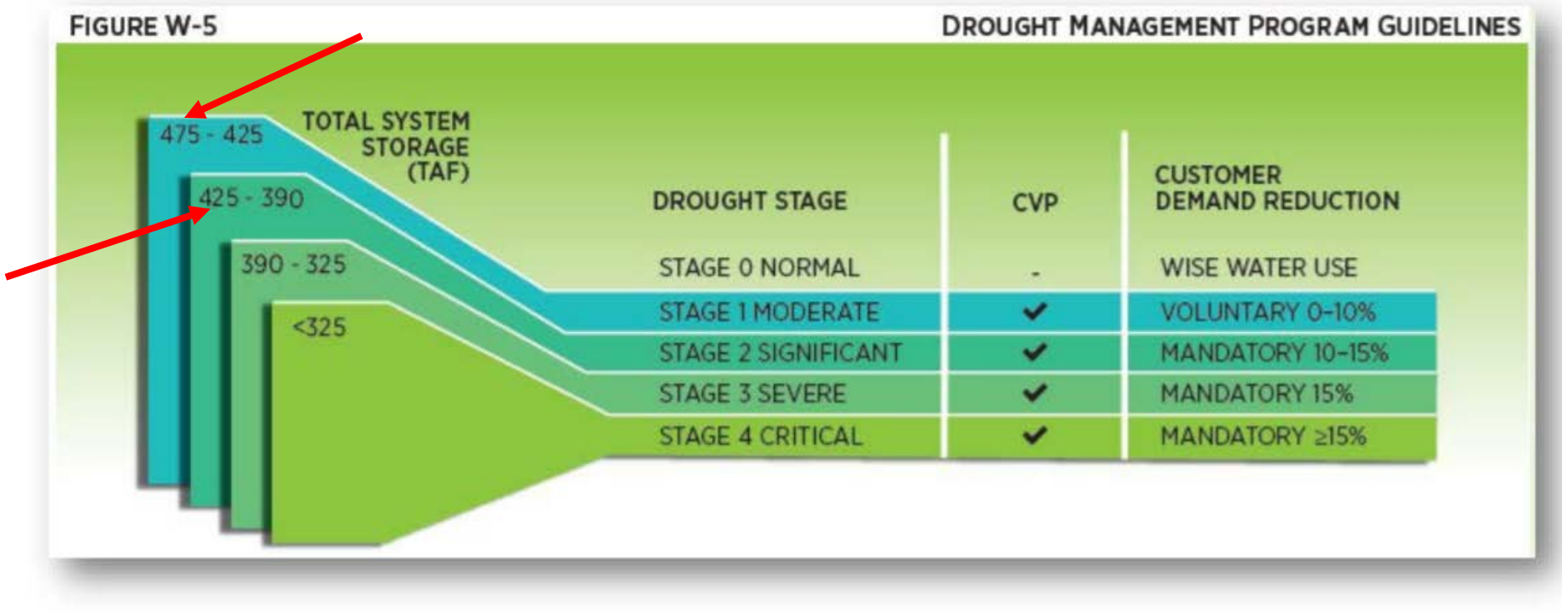
- Rescape, QWEL, Master Gardeners, AWWA, Irrigation Association

Next meeting September 2021



Water Supply and Drought Update

- East Bay precipitation – driest winter on record
- Mokelumne River watershed – second driest winter on record
- Currently Stage 1 drought (ebmud.com/about-us/board-directors/board-meetings/ and ebmud.com/drought)
- In April projected approx. 475 TAF. Due to runoff rapid soil infiltration rates, likely 425 TAF.
- Water Wednesdays, monthly virtual meeting - June 16, 6-8pm



Presentation Overview

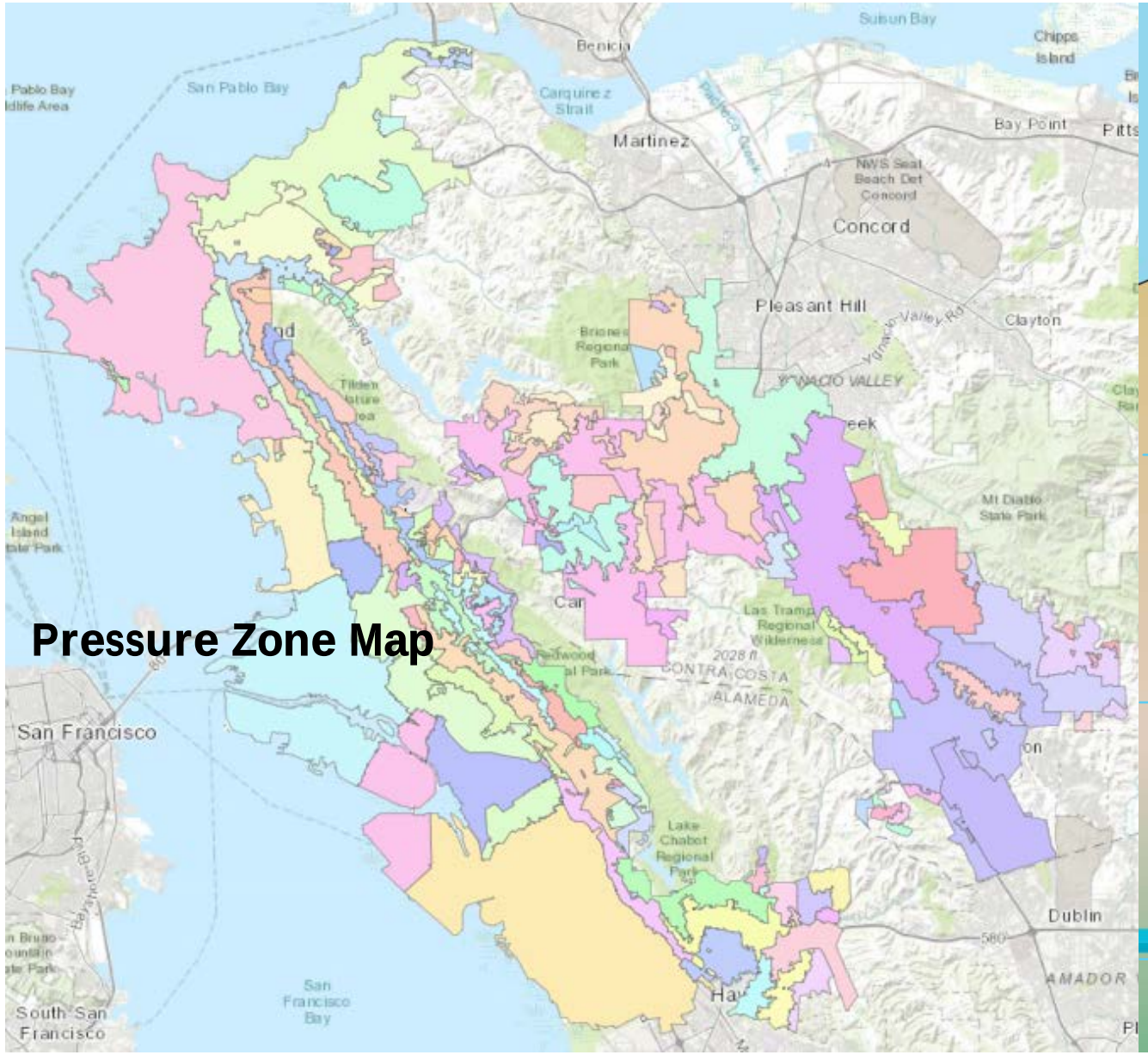
- Pressure zones
- Converting mixed-use to irrigation only meter
- Irrigation system pressure loss
- Controllers, flow and soil sensors
- Irrigation scheduling
- Q and A
- Auditing
- Water budgets
- Leak detection
- AMI meter data
- Flowmeters

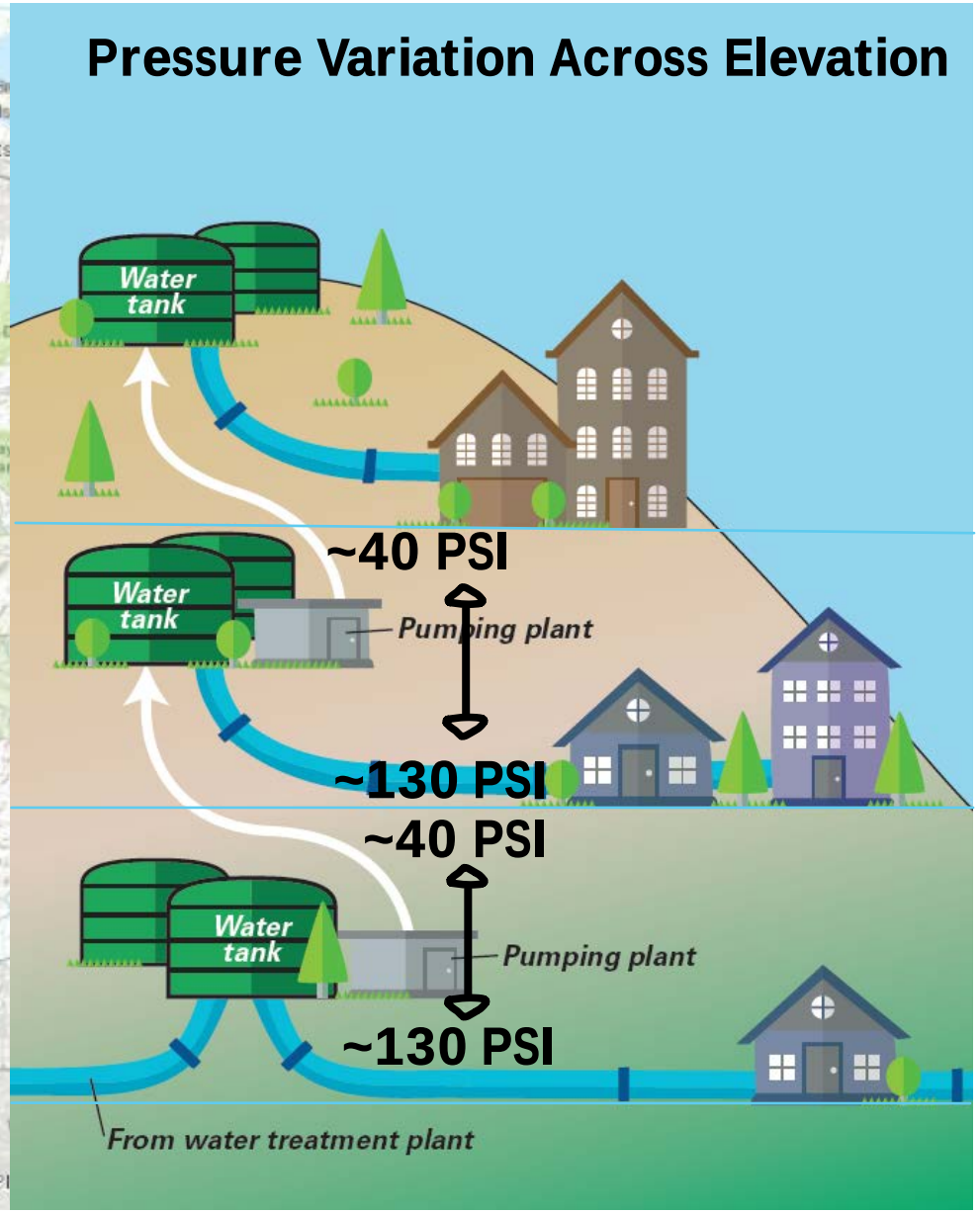
Pressure Zones and Meters

- Pressure
  - Pressure zones
  - Pressure variation across zones
  - Pressure losses in irrigation systems

- Metering
  - Submeters and dedicated irrigation meters
  - New and existing services

Pressure Zones and Elevation Bands





Determine Water Pressure

Use a pressure gauge

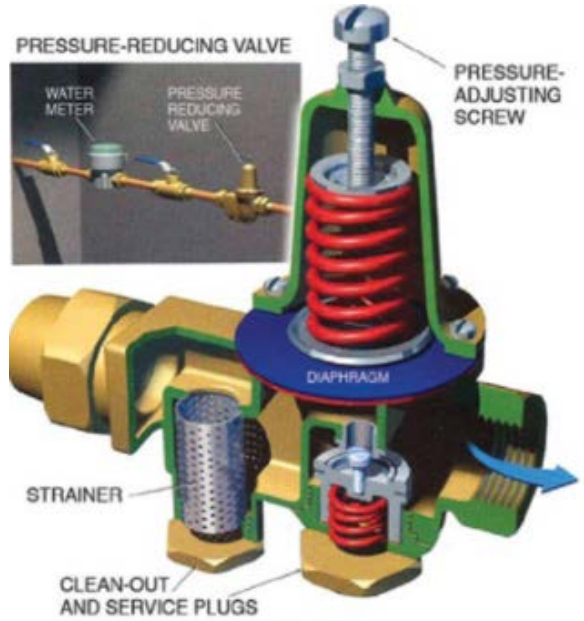


FIGURE 608.2
PRESSURE REDUCING VALVE WITH STRAINER

Reduce pressure as needed

Contact EBMUD

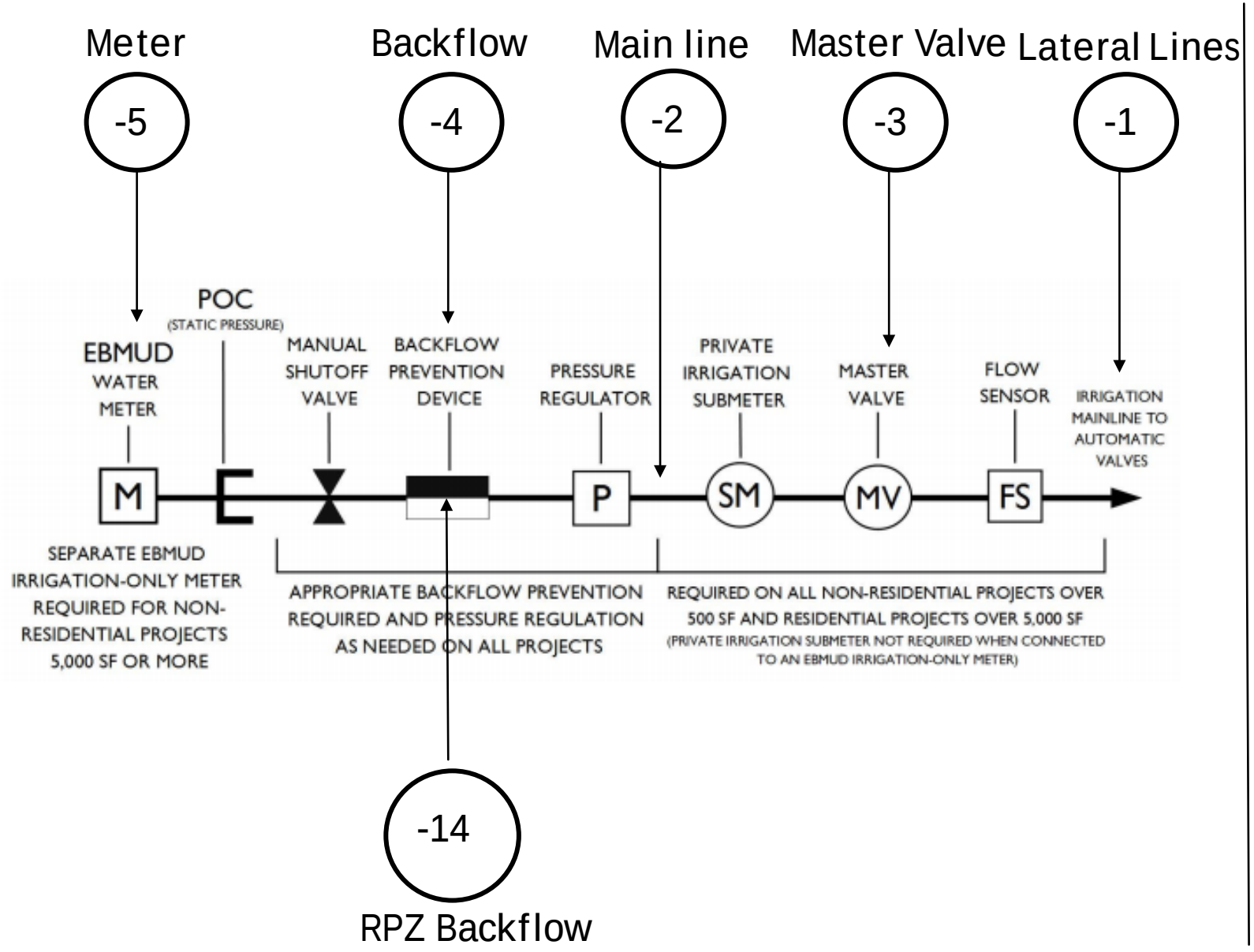
Request pressure information

https://www.ebmud.com/customers/water-pressure/

Online form or call 1-866-403-2683

Source: *2015 Uniform Plumbing Code*

Irrigation System Pressure



Total

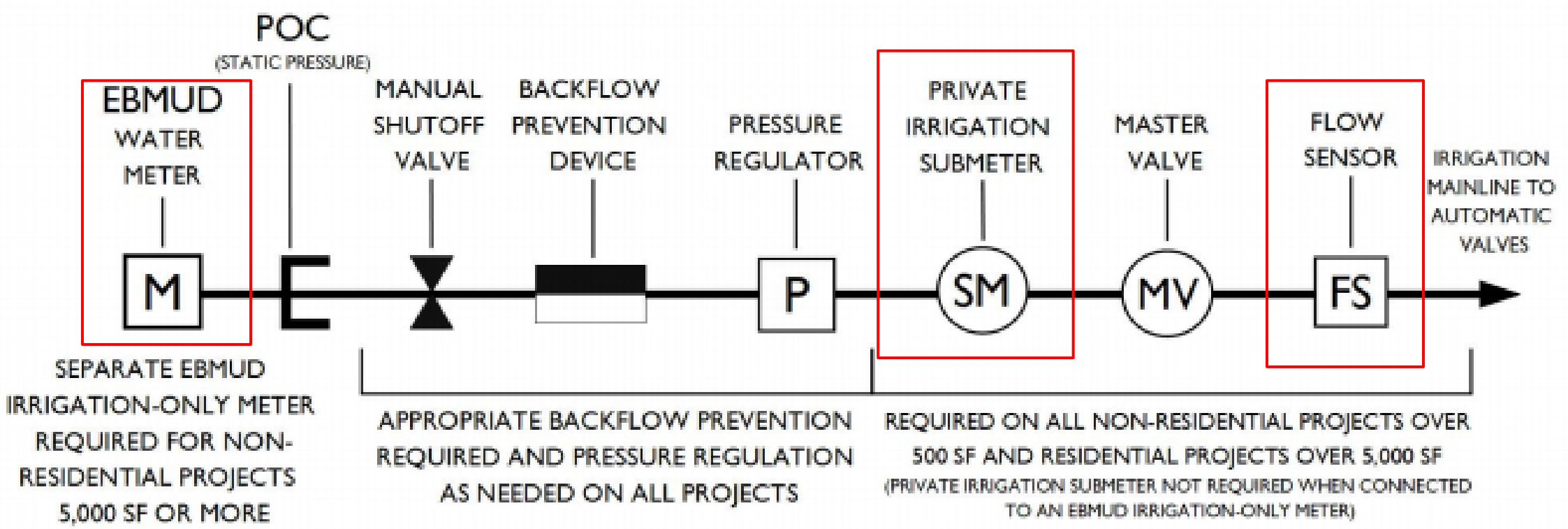
-15 PSI

to

-25 PSI

Emitter Type	Range
Drip Irrigation	15-30 PSI
Fixed sprinklers	15-30 PSI
Rotating sprinklers	30-55 PSI
Rotors	25-65 PSI

Meters, Flowmeters, Flow Sensors



Requirements for New and Expanded Service

District Regulations - Section 31			
Customer Type	Less than 1000 Sq. Ft.	1000-5000 Sq. Ft.	Over 5000 Sq. Ft.
Residential	Optional	Optional	Submeter or Dedicated Irrigation
Non-Residential	Optional	Submeter or Dedicated Irrigation	Dedicated Irrigation Meter

Converting Mixed Use to Dedicated Irrigation Meters

Question

In cities where EBMUD charges for wastewater and sewer treatment, is there a rule of thumb as to when it makes sense for a large multifamily property to decouple irrigation usage from an existing single meter and install a separate irrigation water meter?
(Tom White, Eden Housing)

Considerations

Costs and savings will vary significantly from project to project.

Costs

- New meter service - $30-50k
- Monthly/bi-monthly Water Service Charge for the new meter

Benefits:

- Avoided wastewater fees and sewer fees (varies by city/area)
- Better monitoring water use
- IRIS Water Budget – shows actual water use and budgeted use

Irrigation

HUNTER INDUSTRIES

Built on Innovation®

Christine Hawkins

Controllers

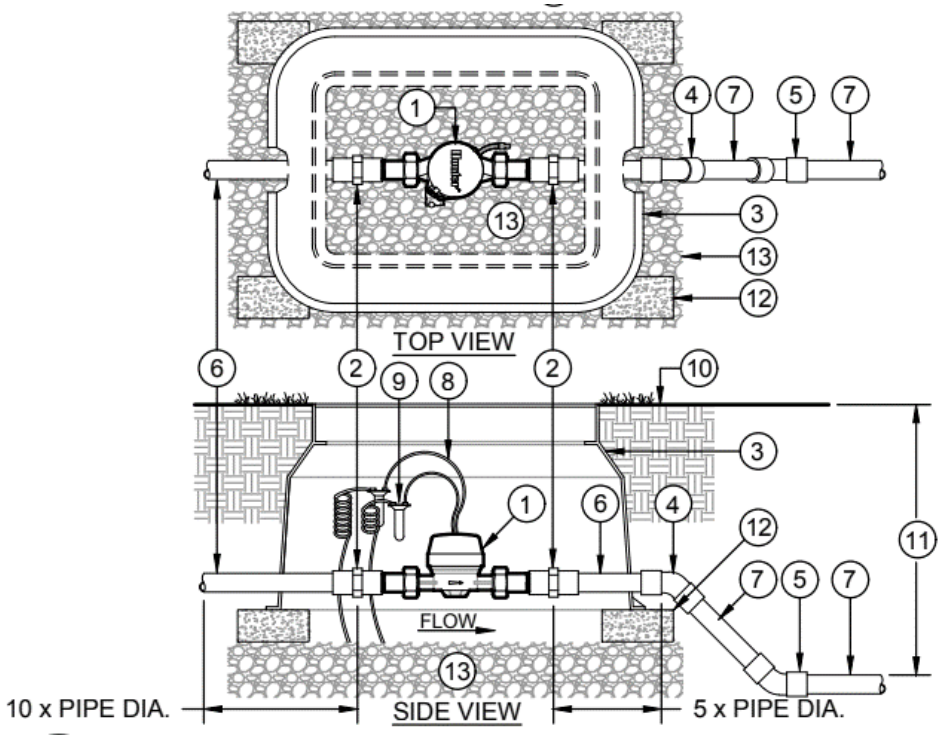
Controllers

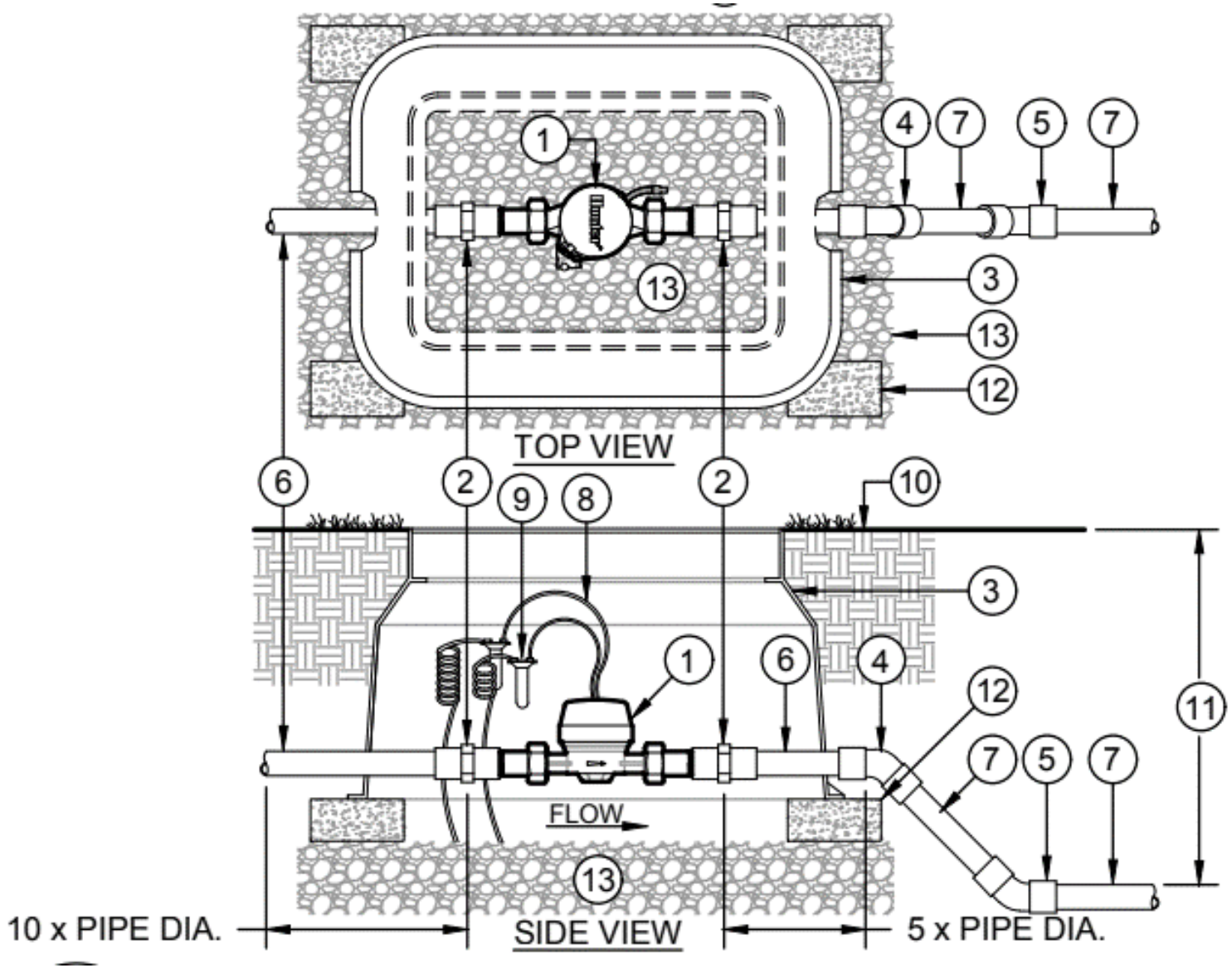
- Location, location, location
- Power source
- Connection to software
- Station count
- Programming
- Sensors

Sensors

Flow Sensors

- Purpose
- Sensor vs. Meter
- Compatibility with controller
- Size per flow
- Install for turbulence
- Follow manufacturer guidelines




TOP VIEW
SIDE VIEW
FLOW
10 x PIPE DIA.
5 x PIPE DIA.
1
2
3
4
5
6
7
8
9
10
11
12
13

Soil Moisture Sensors (SMS)

- EPA Water Sense Certification
- Published Feb 11, 2021
- Read more, here: https://www.epa.gov/watersense/soil-moisture-based-irrigation-controllers

SOIL-CLIK

- Highly efficient water-saver that measures soil moisture within the root zone
- When the probe senses the soil has reached its desired moisture level, it will shut down irrigation and prevent wasted water
- Comprised of a moisture-sensing probe and a control module
- Probe can be installed up to 1,000' (300 m) from the irrigation controller
- Module is used to program desired soil moisture level, and is also equipped with a one-touch manual override to allow sensor bypass for special conditions

WaterSense
Meets EPA Criteria

Scheduling

		PROGRAM A	PROGRAM B	PROGRAM C	PROGRAM D
Days to Water		S **M** T W **T** F **S**	S **M** T W **T** F S	S M T W **T** F S	S **M** T W **T** F S
Program Start Times	1	10:00 pm	3:00 am	7:30 am	3:00 pm
	2	12:30 am	4:30 am	11:15 am	
	3		6:00 am		
	4				
STATION	LOCATION	STATION RUN TIME	STATION RUN TIME	STATION RUN TIME	STATION RUN TIME
1	Field Edge	29:00			
2	Field Edge	29:00			
3	Field Center Left	29:00			
4	Field Center Middle	29:00			
5	Field Center Right	29:00			
6	Drip Perimeter East		21:00		
7	Drip Perimeter West		21:00		

Scheduling

- Programs = frequency
- Run times = duration
- Need to know:
  - Peak water requirement
  - Local codes
  - Other restrictions

		PROGRAM A	PROGRAM B	PROGRAM C	PROGRAM D
Days to Water		S **M** T W **T** F **S**	S **M** T W **T** F S	S M T W **T** F S	S **M** T W **T** F S
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7	Drip Perimeter West		21:00		

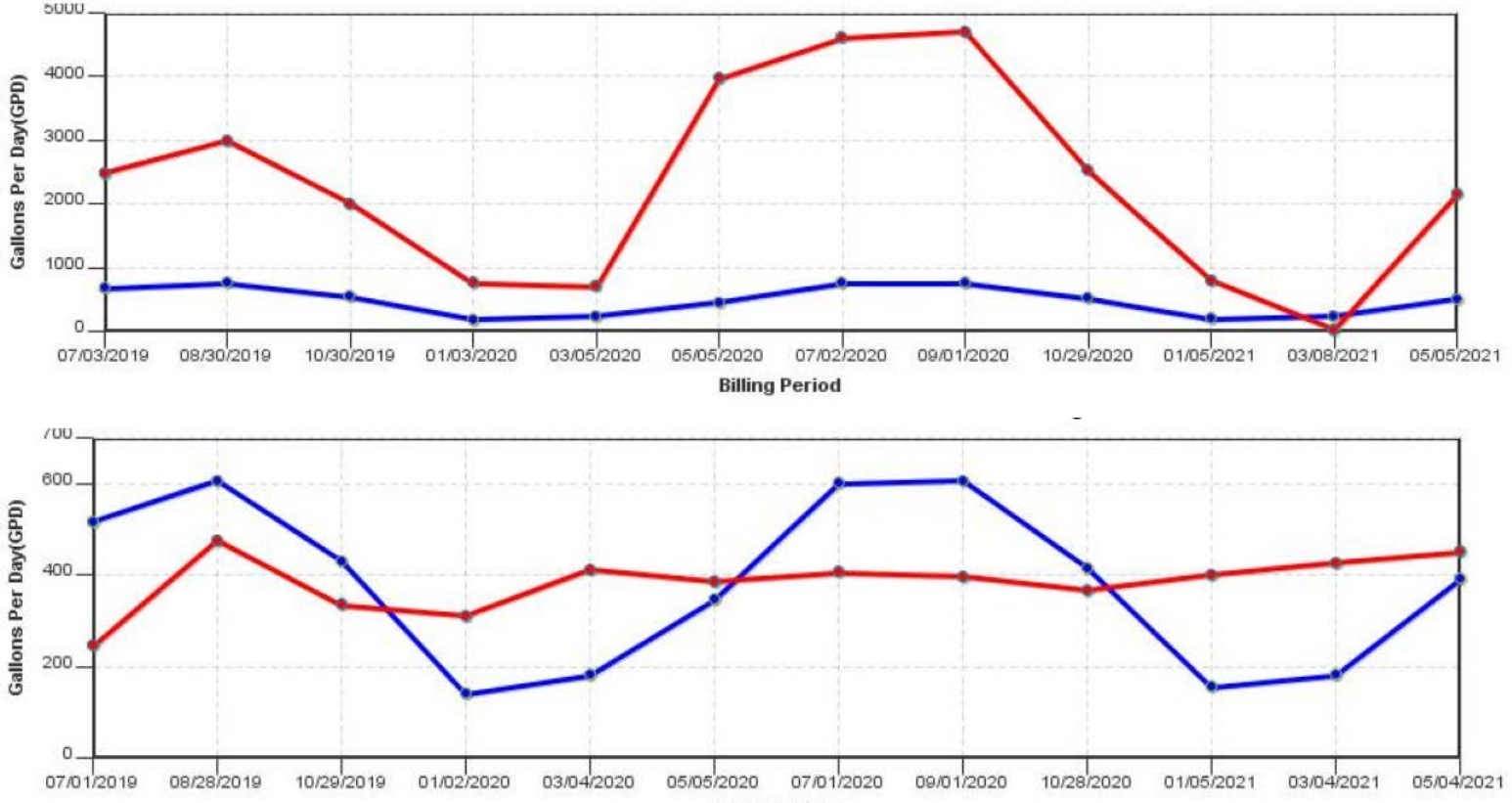
QUESTIONS

- What are some best practices for conforming seasonal irrigation schedules to WELO estimated annual total water usage and maximum allowances? (Tom White)
- I'm hoping that during this webinar, we will learn the actual weather sources of information that various irrigation controllers use and how they use that information. How site-specific is the weather information? Specifically, it would be good to know whether any controllers use or could use CIMIS here in California. (Tom Silva)
- What do you do when you have an existing system and landscape when plants with different water needs are in the same zone? (Lou Bendon)
- How do you program a smart controller for a relatively small zone consisting only of low-water use plants but including various sizes with shallow, medium and deep root systems such as ground cover, shrubs and trees? (Scott Sommerfeld)

Auditing and Smart Controllers

Question

What good is a smart controller absent an efficiently operating irrigation system e.g. misaligned heads, excess pressure, knowing the precipitation rate of heads and ensuring matches precipitation? Considering the above, would you recommend an audit first? (Lou Bendon)



Budget(GPD)

Consumption(GPD)

Irrigation Audits

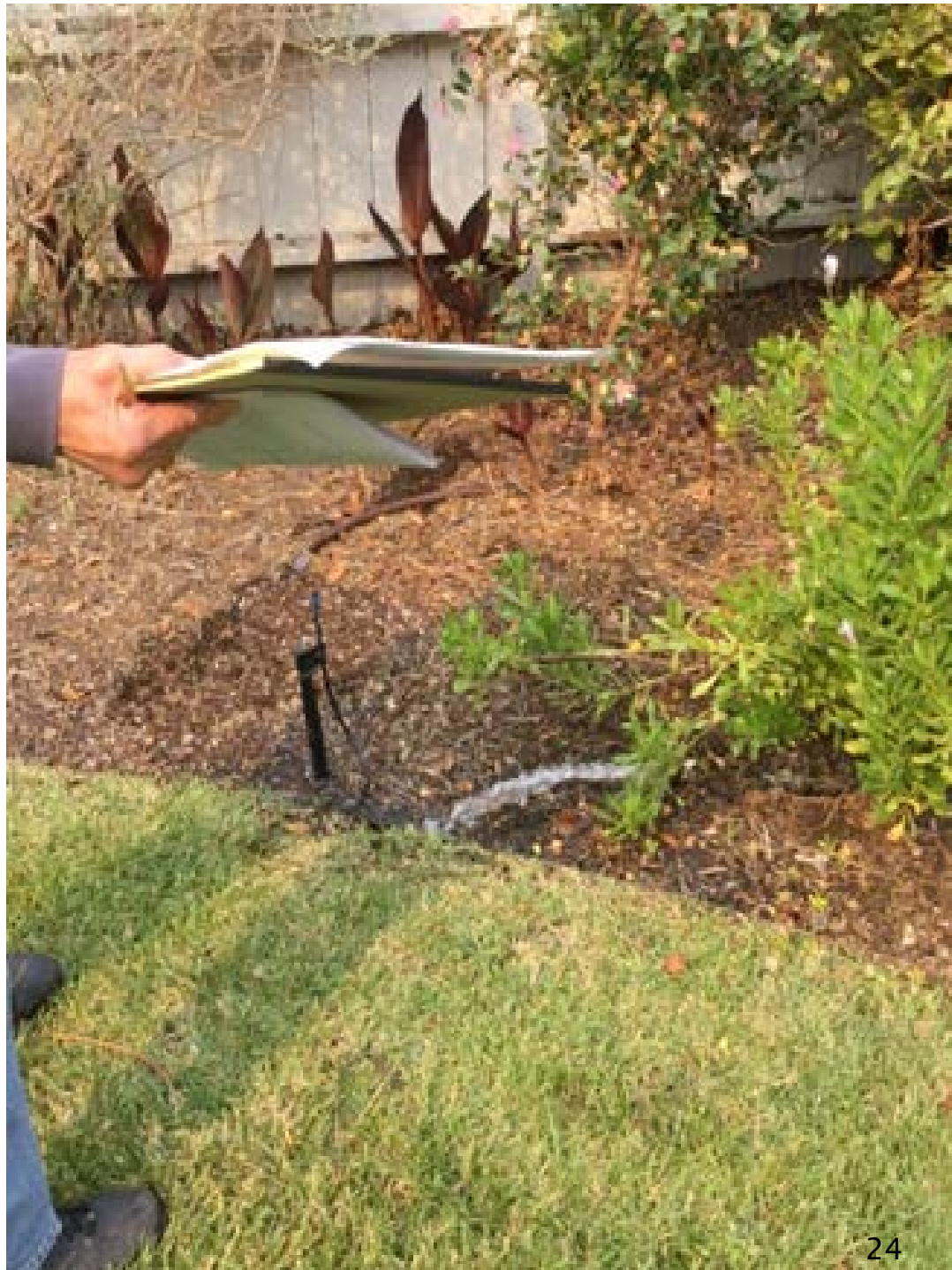
<u>Full System Audits</u>

- Ground up approach with complete scope: soils, creating irrigation schedule to match plant needs for every zone, testing operation.
- Compliance with MWELO or to improving underperforming sites

<u>Basic Audit or Check-up</u>

- Inspect operating condition of system
- Review of schedule and flowrates
- Annual preventative check up or leak detection

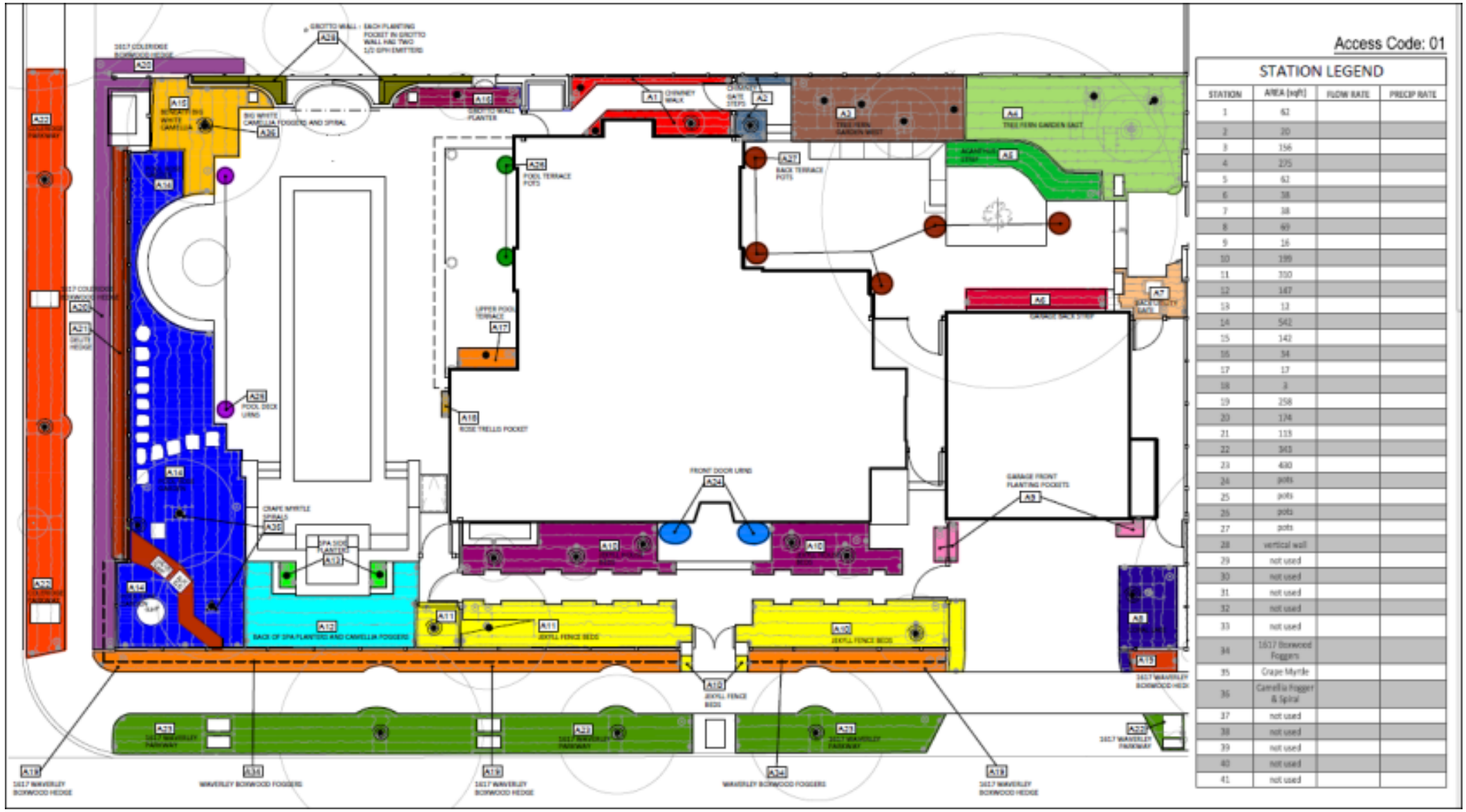
The work completed through MWELO or a detailed irrigation audit supports all future basic audits.



LAWN & LANDSCAPE WATERING SCHEDULE

	LAWN			LANDSCAPE								
SPRINKLER /DRIP TYPE	Pop-Up/ Fixed-Spray Sprinkler	Impact/ Rotor Sprinkler	Multi-stream/ MP Rotator Sprinkler	Pop-Up/ Fixed-Spray Sprinkler	Impact/ Rotor Sprinkler	Multi-stream/ MP Rotator Sprinkler	Drip Emitters 1 gph 2 per plant 0.3" per hour	Inline Drip 0.6 gph 18" spacing 0.43" per hour	Inline Drip 0.6 gph 12" spacing 0.96" per hour	Inline Drip 0.9 gph 12" spacing 1.42" per hour	High Volume Drip 10 gph 1 per plant 1.5" per hour	Micro-Sprays 20 gph 1 per plant 1.6" per hour
												
CYCLES	3 cycles	3 cycles	3 cycles	3 cycles	3 cycles	3 cycles	3 cycles	3 cycles	3 cycles	3 cycles	3 cycles	3 cycles
TIMING	3–6 minutes	7–10 minutes	15–20 minutes	3–6 minutes	9–12 minutes	20–24 minutes	30 minutes	20 minutes	10 minutes	6 minutes	6 minutes	5 minutes
JANUARY	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
FEBRUARY	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
MARCH	1 day per week	1 day per week	1 day per week	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
APRIL	1–2 days per week	1–2 days per week	1–2 days per week	1 day per week	1 day per week	1 day per week	1 day per week	1 day per week	1 day per week	1 day per week	1 day per week	1 day per week
MAY	2–3 days per week	2–3 days per week	2–3 days per week	1–2 days per week	1–2 days per week	1–2 days per week	1–2 days per week	1–2 days per week	1–2 days per week	1–2 days per week	1–2 days per week	1–2 days per week
JUNE	3–4 days per week	3–4 days per week	3–4 days per week	2 days per week	2 days per week	2 days per week	2 days per week	2 days per week	2 days per week	2 days per week	2 days per week	2 days per week
JULY	3–4 days per week	3–4 days per week	3–4 days per week	2 days per week	2 days per week	2 days per week	2 days per week	2 days per week	2 days per week	2 days per week	2 days per week	2 days per week
AUGUST	3–4 days per week	3–4 days per week	3–4 days per week	2 days per week	2 days per week	2 days per week	2 days per week	2 days per week	2 days per week	2 days per week	2 days per week	2 days per week
SEPTEMBER	3 days per week	3 days per week	3 days per week	1 day per week	1 day per week	1 day per week	1 day per week	1 day per week	1 day per week	1 day per week	1 day per week	1 day per week
OCTOBER	2 days per week	2 days per week	2 days per week	1 day per week	1 day per week	1 day per week	1 day per week	1 day per week	1 day per week	1 day per week	1 day per week	1 day per week
NOVEMBER	1 day per week	1 day per week	1 day per week	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
DECEMBER	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

Irrigation Map and Station Legend



Access Code: 01

STATION LEGEND

STATION	AREA (sqft)	FLOW RATE	PRECIP RATE
1	62		
2	20		
3	156		
4	275		
5	62		
6	38		
7	38		
8	99		
9	16		
10	199		
11	100		
12	147		
13	12		
14	542		
15	142		
16	94		
17	17		
18	3		
19	258		
20	174		
21	133		
22	343		
23	430		
24	pots		
25	pots		
26	pots		
27	pots		
28	vertical wall		
29	not used		
30	not used		
31	not used		
32	not used		
33	not used		
34	1617 Boxwood Foggers		
35	Crape Myrtle		
36	Camellia Fogger & Spiral		
37	not used		
38	not used		
39	not used		
40	not used		
41	not used		

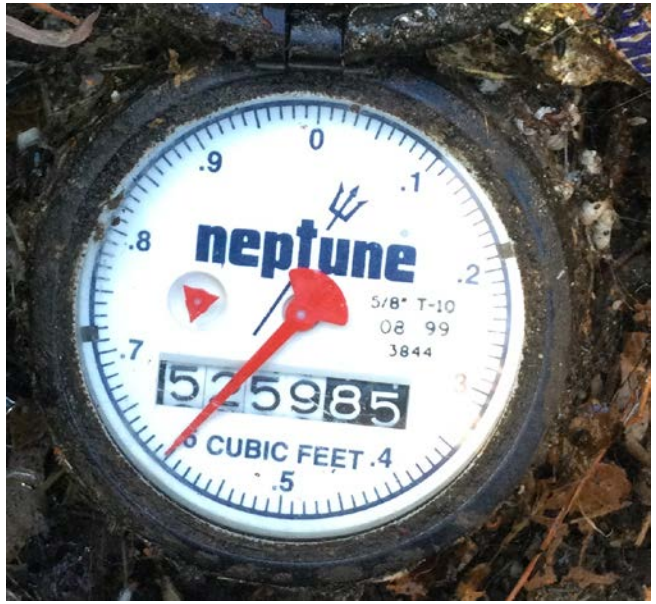
Water Budget Adjustments

	East of Hills		West of Hills	
	ET - Inches	Budget Adjustment	ET - Inches	Budget Adjustment
Month	East		West	
January	1.27	0% - 20%	1.01	0% - 20%
February	1.80	0% - 30%	1.43	0% - 30%
March	3.34	30% - 50%	2.68	30% - 50%
April	4.53	40% - 60%	3.57	50% - 70%
May	6.28	70% - 90%	4.78	70% - 90%
June	7.17	80% - 100%	5.42	80% - 100%
July	7.64	80% - 100%	5.87	80% - 100%
August	6.78	70% - 90%	4.55	60% - 80%
September	4.93	50% - 70%	3.37	40% - 60%
October	3.24	30% - 50%	2.63	30% - 50%
November	1.79	10% - 30%	1.38	10% - 30%
December	1.14	0% - 20%	0.97	0% - 20%
Total ET	49.9	Total ET	37.6	

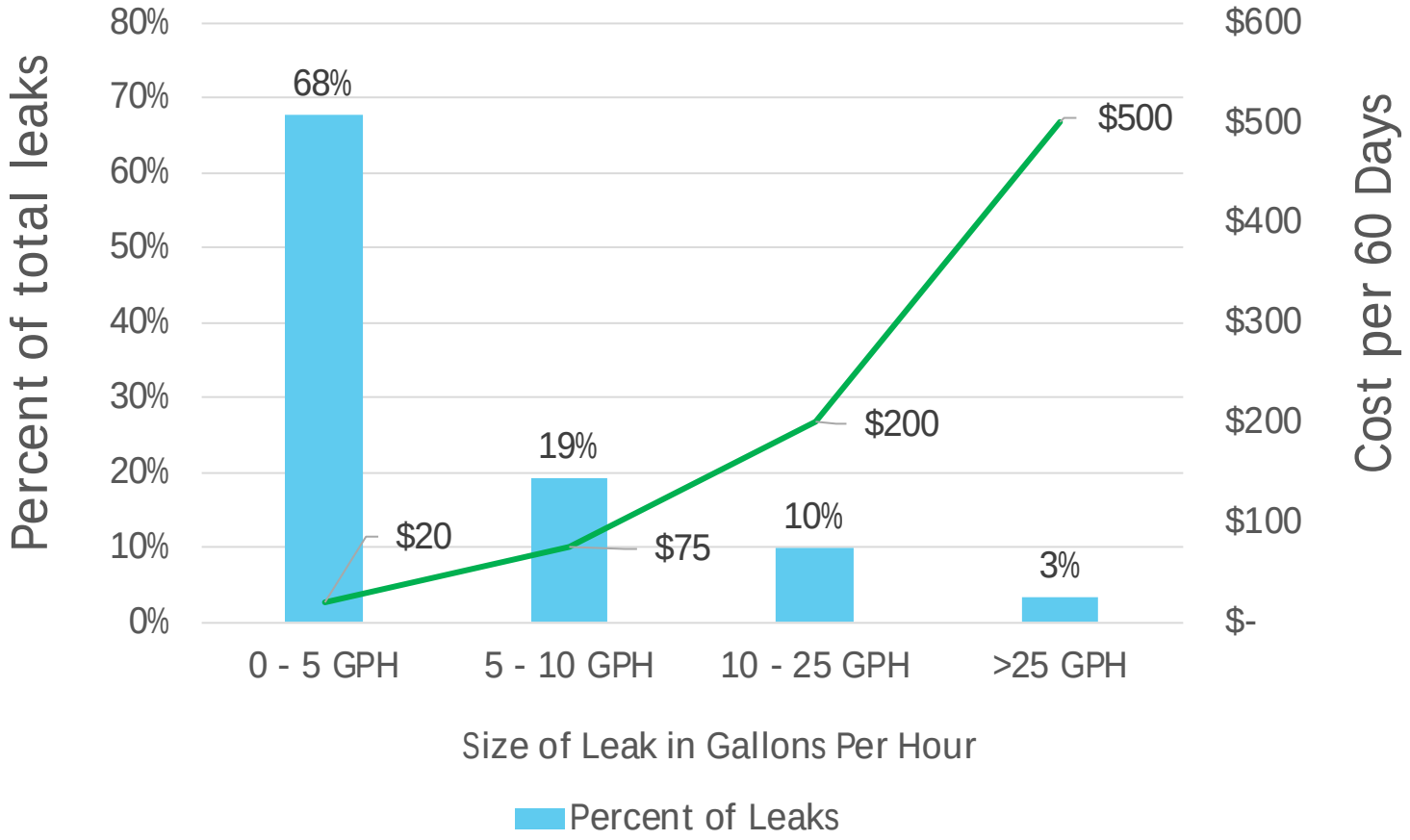
Adjustment factor based on July water use as 100% of schedule time.

Evaluate Water Use Data

- Leaks
- Reading your meter
- AMI meters, flowmeters
- Web portals

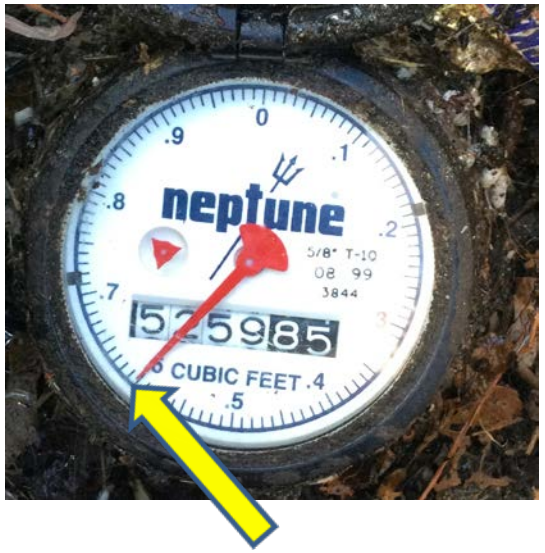


Common Leaks and Costs



Cause of Leak	Count	%
Outdoor Watering System	219	42%
Toilet	124	24%
Pipes	76	14%
Faucet or Shower	66	13%
Other	26	6%

Reading your Meter



Read 1

5	2	5	9	.	8	5	6

Sweep hand or Needle

Cubic Feet

100 Cubic Feet (1 CCF)

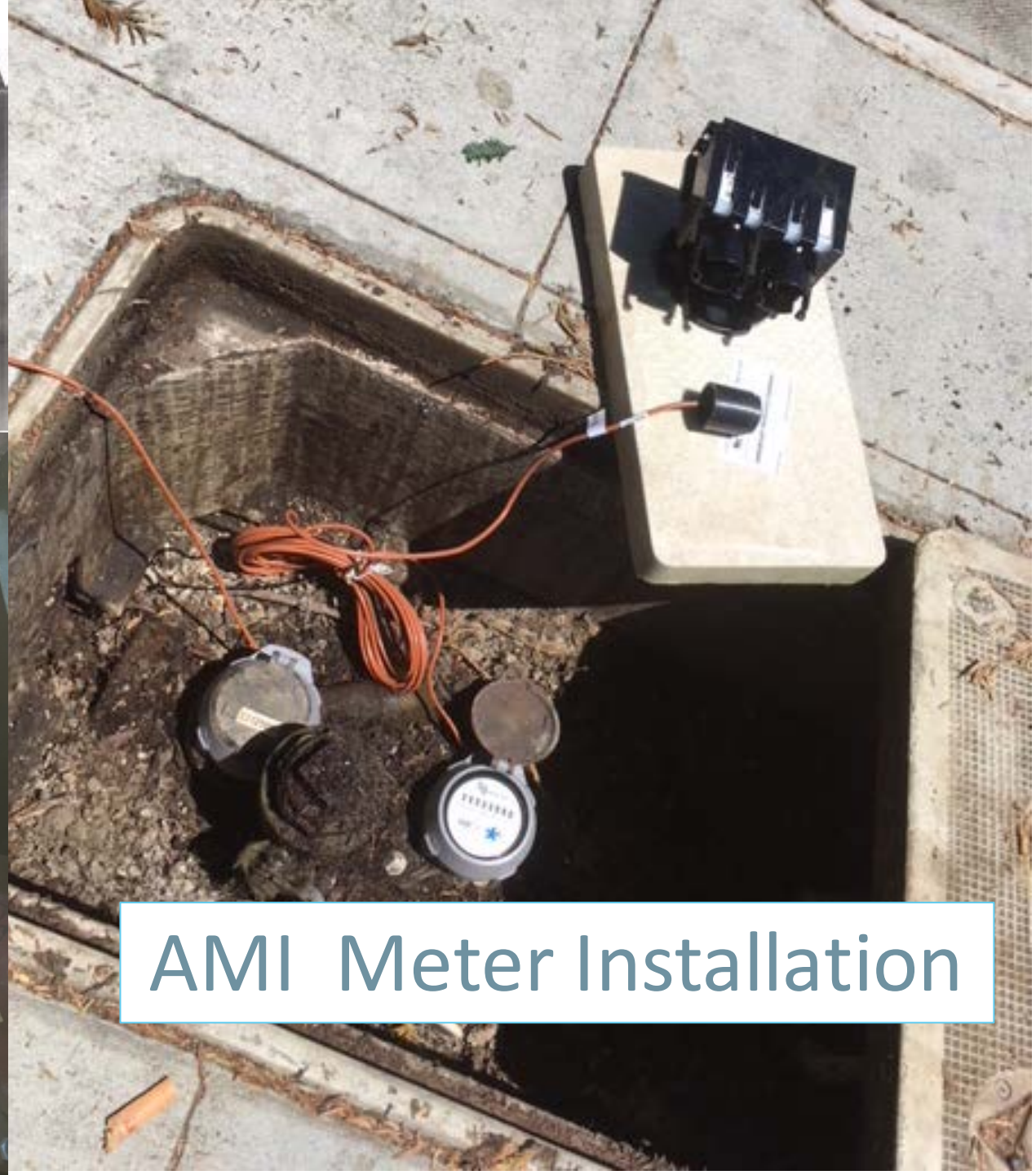
Wait for some time to determine flowrate
For example 1 min.

Read 2

5	2	5	9	.	8	7	1

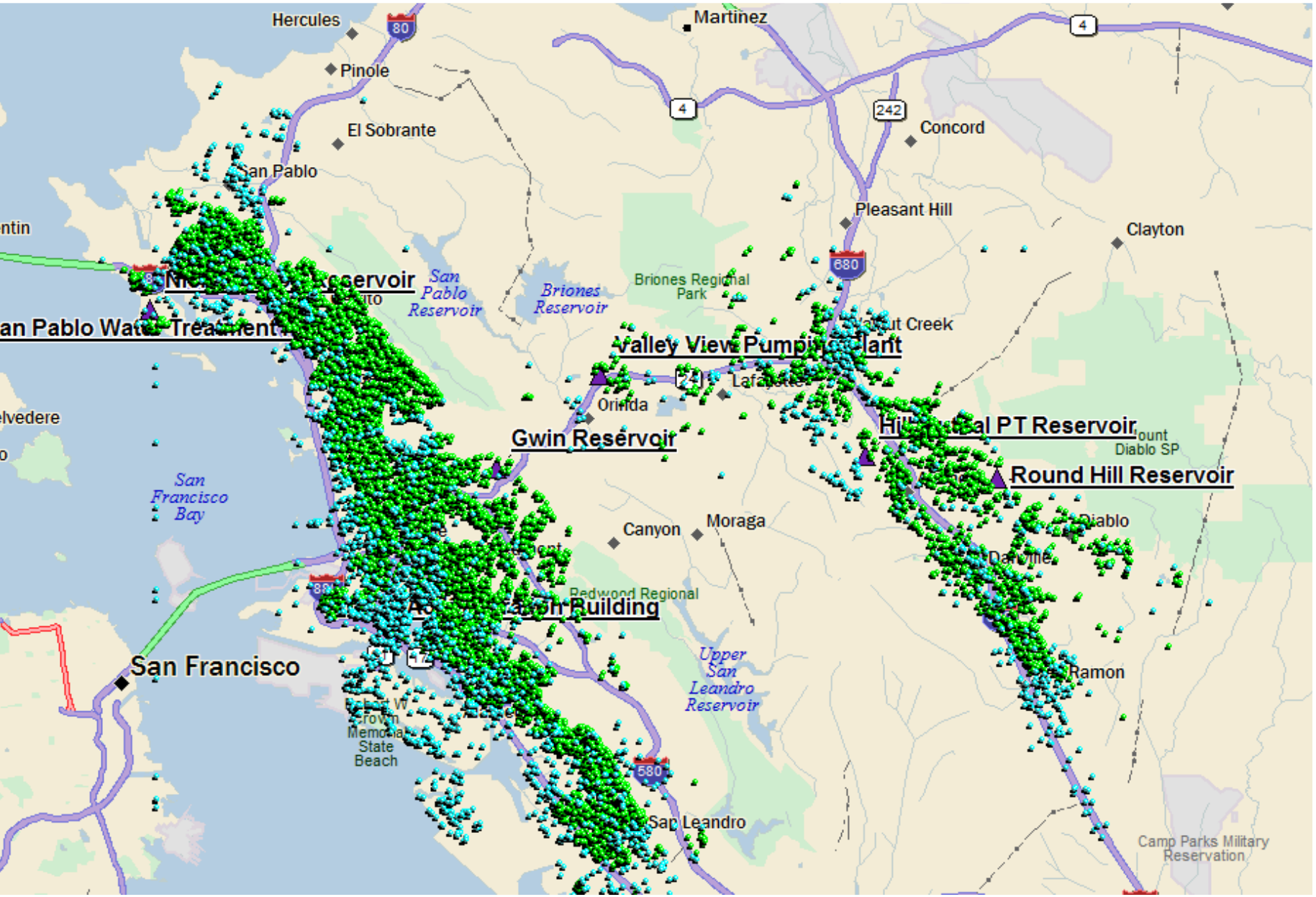
1.5 CF/Minute or 11.2 GPM (1.5*7.48)

Read 2	5	2	5	9	.	8	7	1
Read 1 -	5	2	5	9	.	8	5	6
				0	.	0	1	5



AMI Meter Installation

AMI Meter Installation Map (2019 Pilots)



Flowmeters on the Market

In-line

Flo

Phyn

StreamLabs

In Meter Box or Utility Grade Meter

Alert Labs
Flowie-o

Flume

Hydropoint
WaterCompass

Images are from vendor websites and materials.

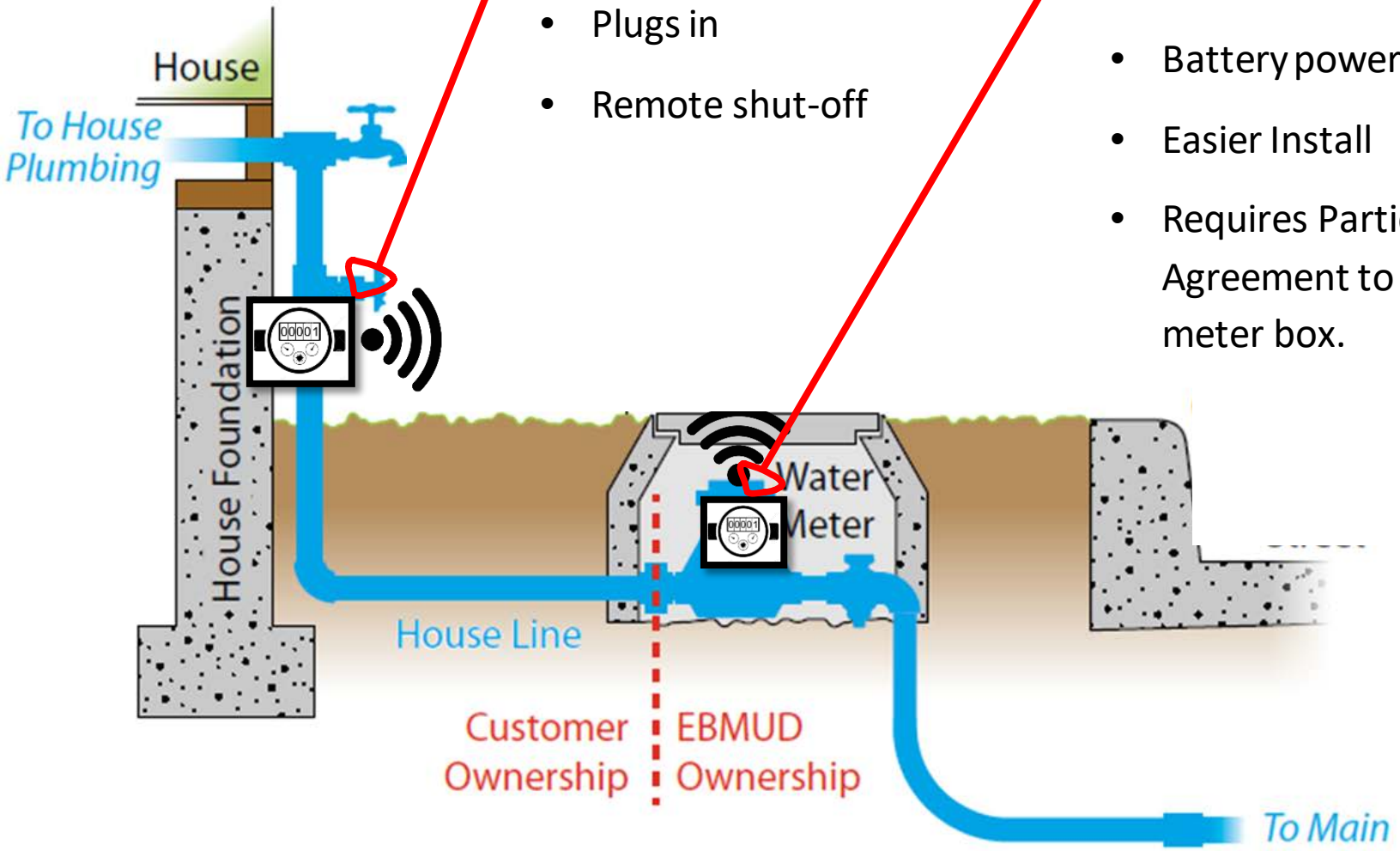
Flowmeter Installation location

In-line flowmeter

- Measures part of system
- Plugs in
- Remote shut-off

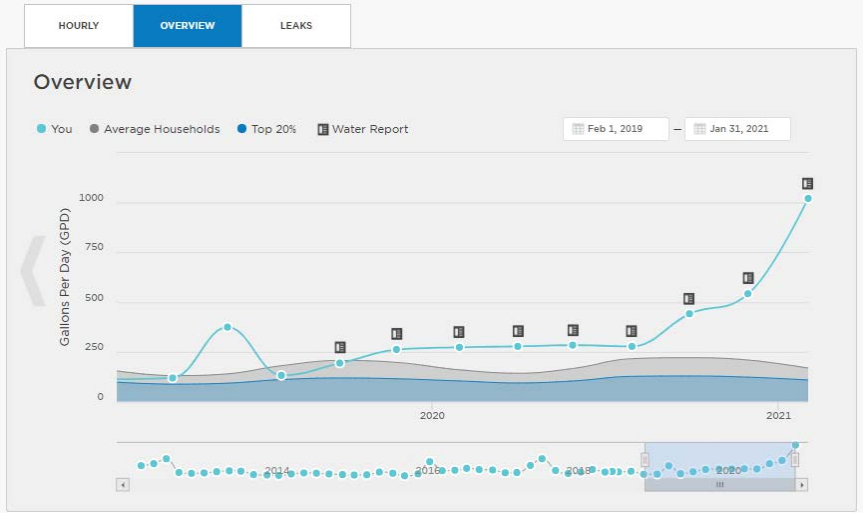
On-meter flowmeter

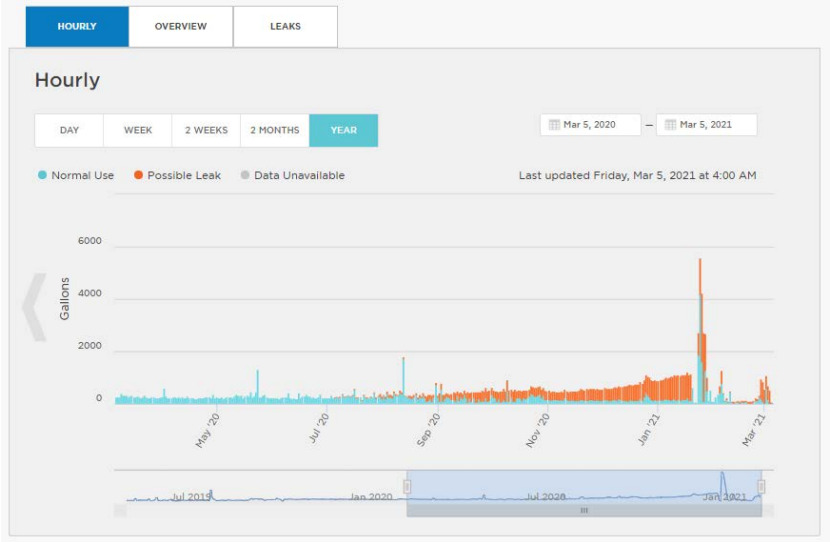
- Measures entire system
- Battery powered
- Easier Install
- Requires Participation Agreement to install in meter box.

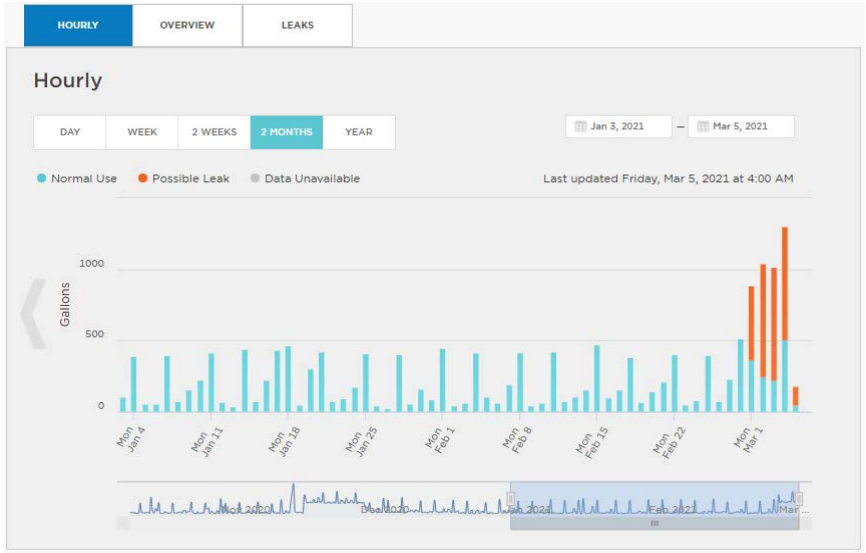


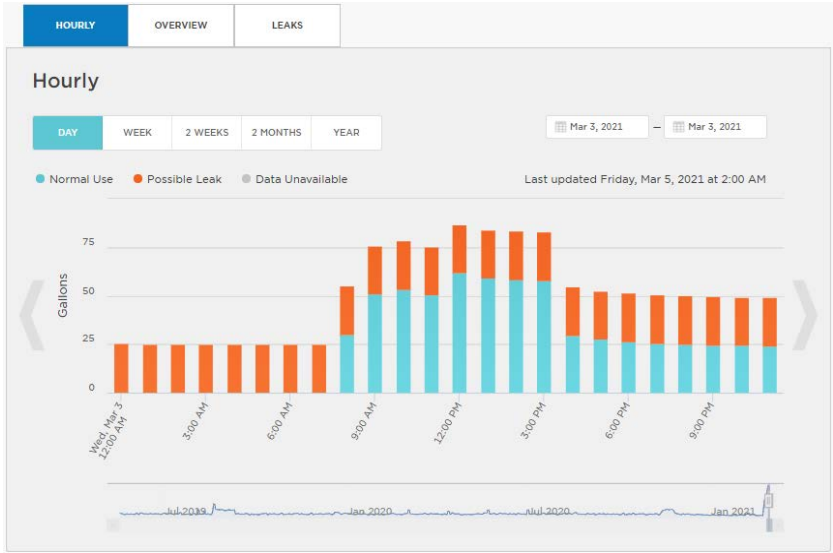
EBMUD Online Water Use Portal

Home | $ Billing | Track | Take Action | Settings









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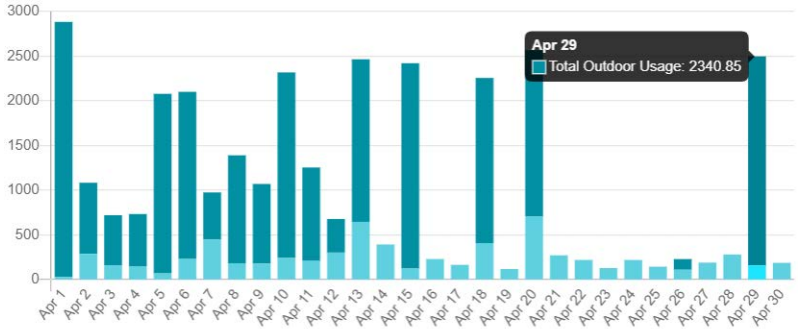
Example Flowmeter Portal

Monthly

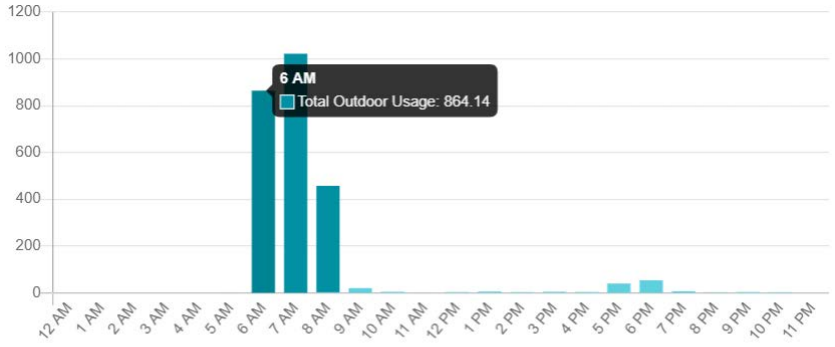
Outdoor Total: 53488.95 gallons
Indoor Total: 25286.58 gallons

Daily



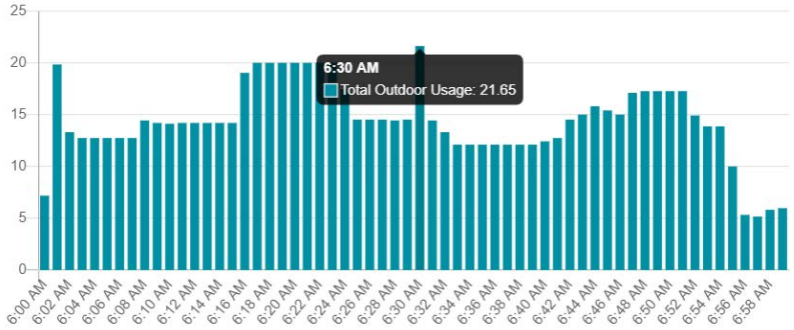
Outdoor Total: 25092.62 gallons
Indoor Total: 7155.69 gallons

Hourly



Outdoor Total: 2340.85 gallons
Indoor Total: 157.12 gallons

Minutely



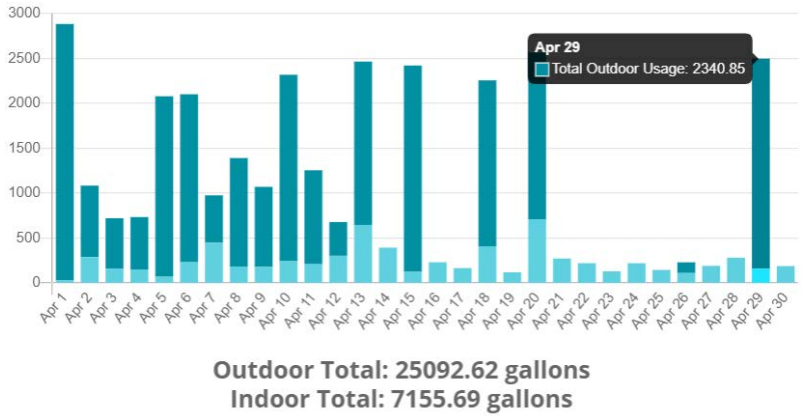
Outdoor Total: 864.14 gallons
Indoor Total: 0.00 gallons

Image Source: Flume user dashboard

Dashboards

Question

Do you recommend using a single dashboard for remotely monitoring real time irrigation flows and schedules across a portfolio of properties vs. monitoring multiple platforms from different manufacturers' irrigation controllers? (Tom White)



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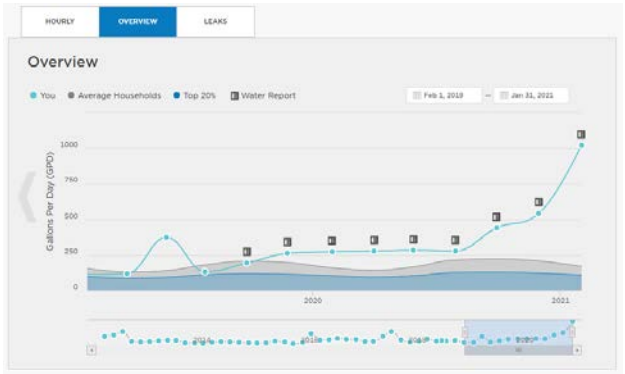
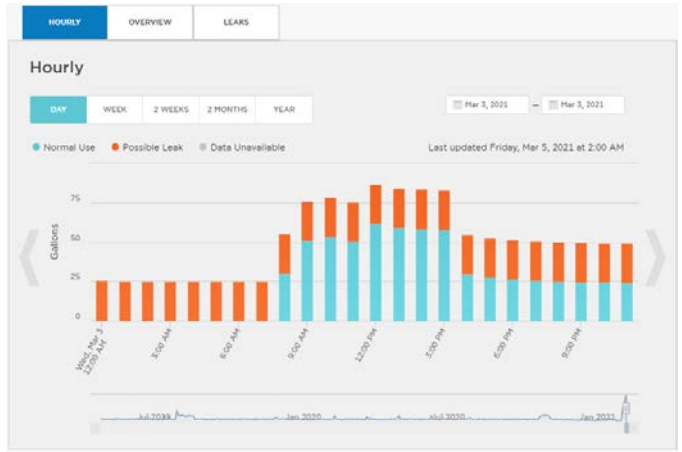
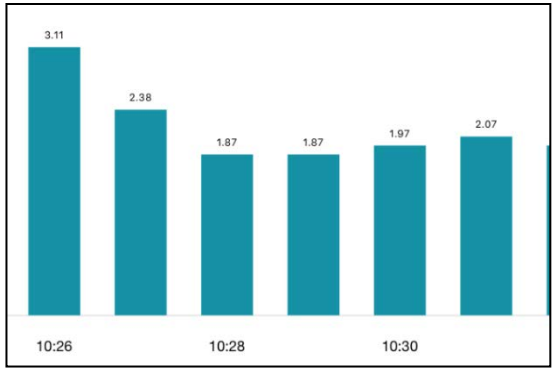
Indoor Total: 7155.69 gallons





Flowmeter Rebate Program

- 50% match on cost, up to $200/device
- 2-year agreement, including data sharing
- On meter flowmeters require Participation Agreement
- Visit https:// www.ebmud.com/rebates for more information



Images are from vendor websites and materials.

Thank you!!!

Kristin.Bowman@ebmud.com

Luke.Sires@ebmud.com

Christine.Hawkins@hunterindustries.com