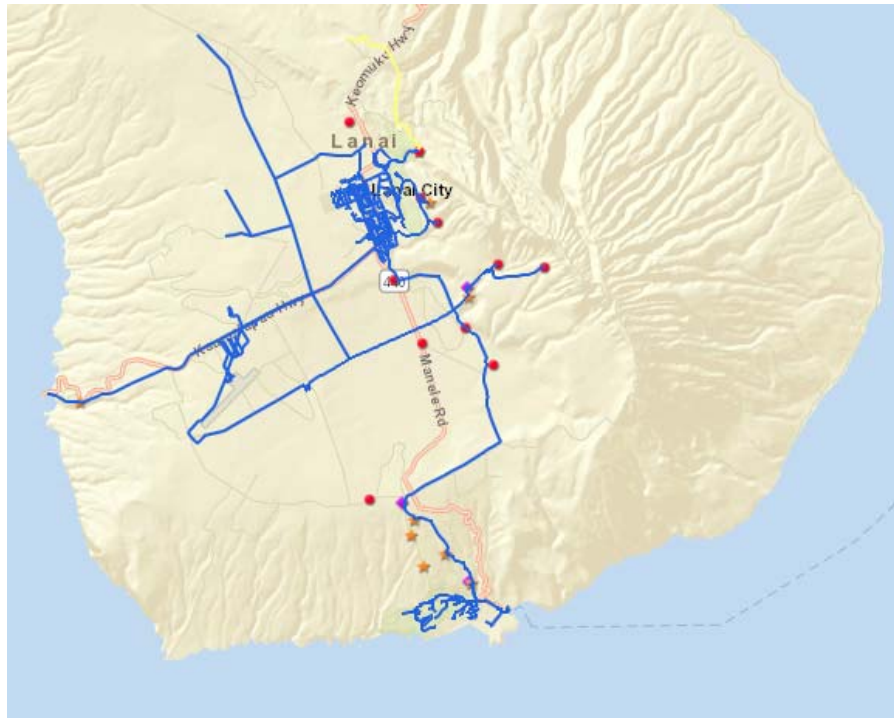


# Lanai Water Systems



9/21/21 – DLNR CWRM's Water Commission

# Drinking Water Systems



- \* PWS – 237 Lanai City Water System
  - \* Wells 3, 6, 7\*, and 8
  - \* 3 reservoirs totaling 2.77 MG
  - \* 36.5 miles of water mains
  - \* 1,394 customers
  - \* Averages  $\approx$  0.57 MGD
- \* PWS – 238 Manele Water System
  - \* Wells 2 & 4
  - \* 2 reservoirs totaling 2 MG
  - \* 31 miles of water main
  - \* 135 customers
  - \* Averages  $\approx$  0.42 MGD

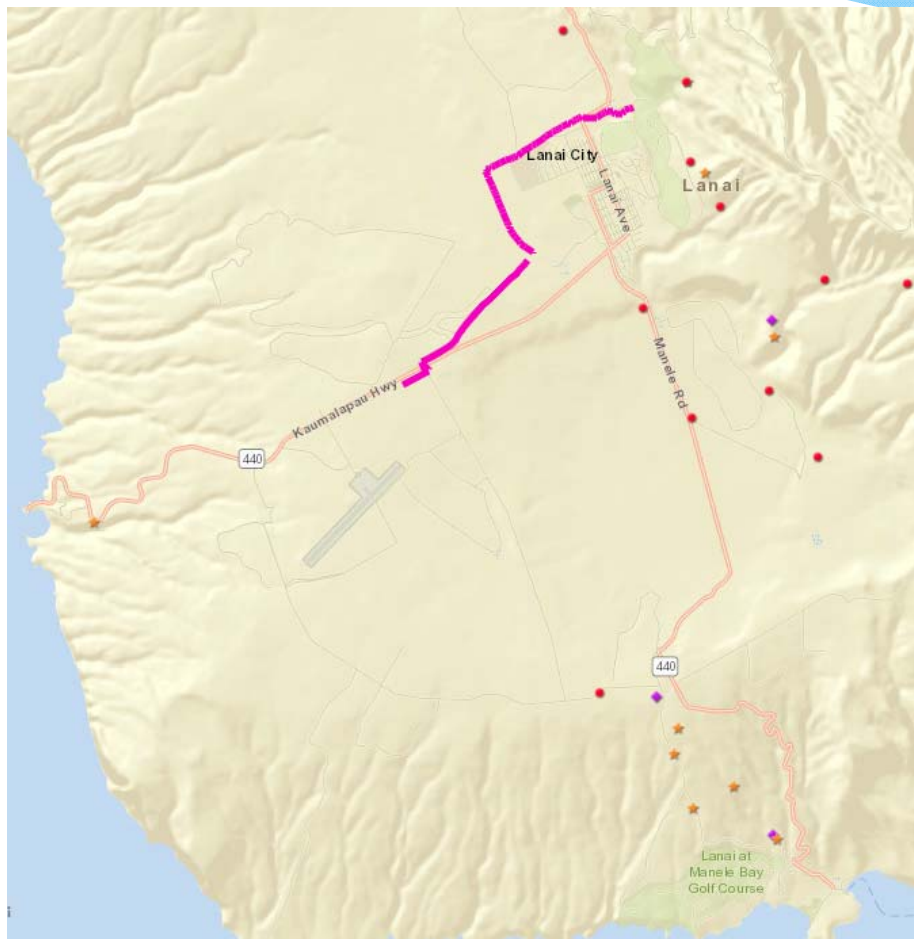
# Brackish/Irrigation Water System



## \* Brackish Irrigation System

- \* Wells 1, 9\*, 14, and 15
- \* 3 Reservoirs totaling 15.08 MG
- \* 11 miles of water mains
- \* 48 customers
- \* Averages  $\approx 0.57$  MGD

# Recycled Water



- \* Two R1 Plants
  - \* Lanai Auxiliary Wastewater Treatment Facility
  - \* Manele Wastewater Treatment Plant (100% re-use at golf course)
- \* Capacity of recycling 100% of the wastewater on island

# Recycled Water



\* <https://www.youtube.com/watch?v=8MxEgUPYC2Q>

VOS6-7 Full Episode - Water Reuse

296 views · Aug 19, 2019

👍 5 🗨️ 0 ➦ SHARE 📌 SAVE ⋮



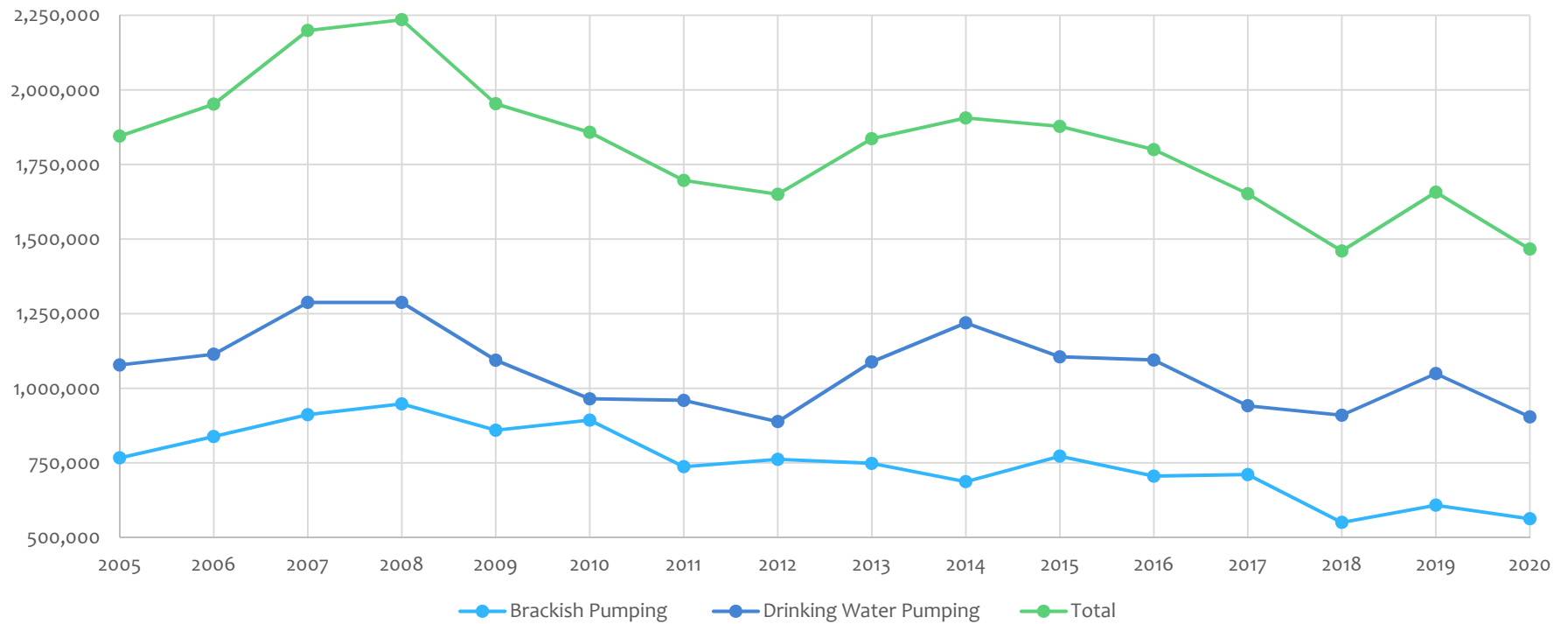
Voice of the Sea TV  
4.04K subscribers

SUBSCRIBE

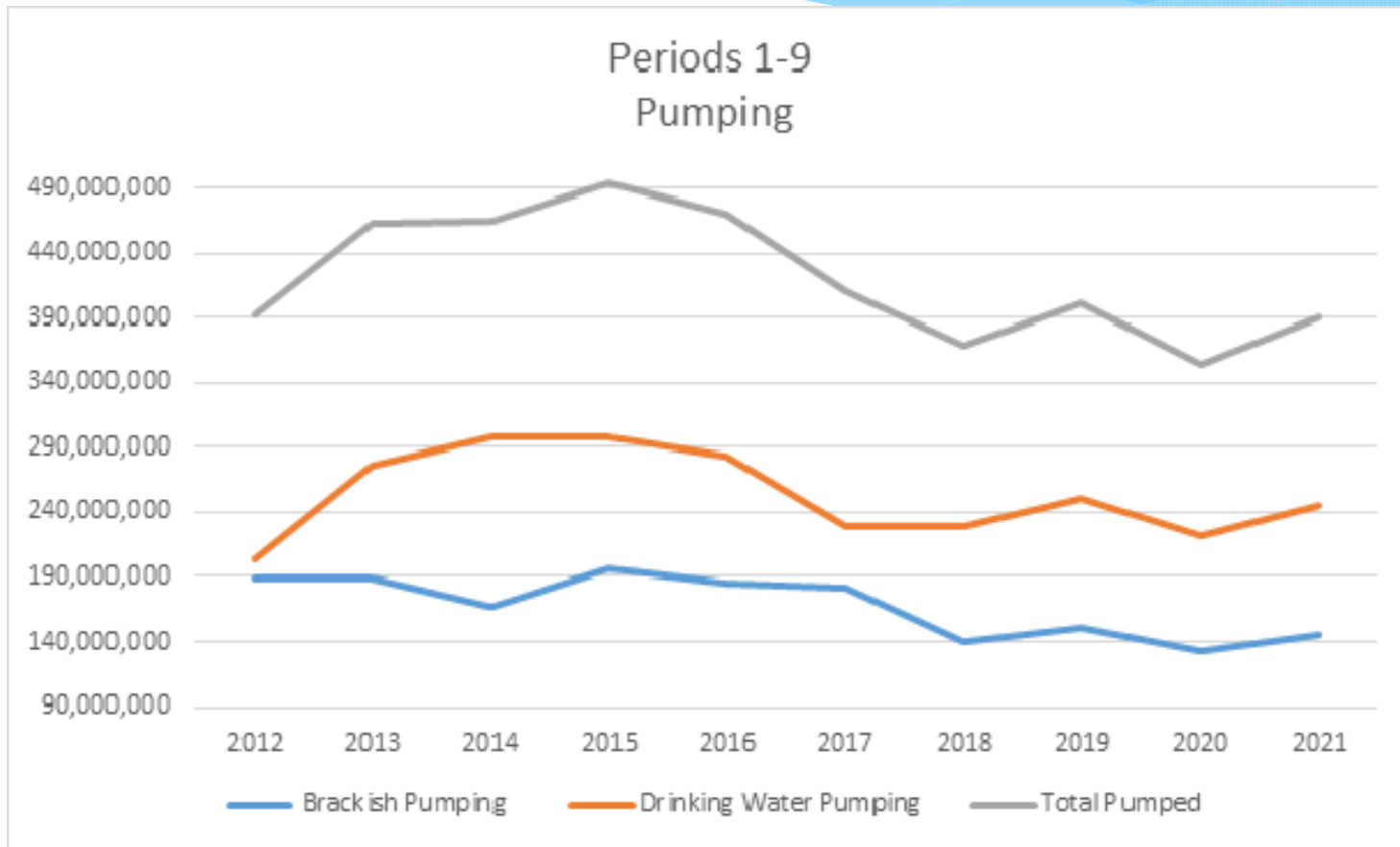


# Lanai Pumping Amounts

Lanai Water Pumping Rates  
Sustainable Yield = 6MG/Day



# Periodic Water Reports – Every 28 Days

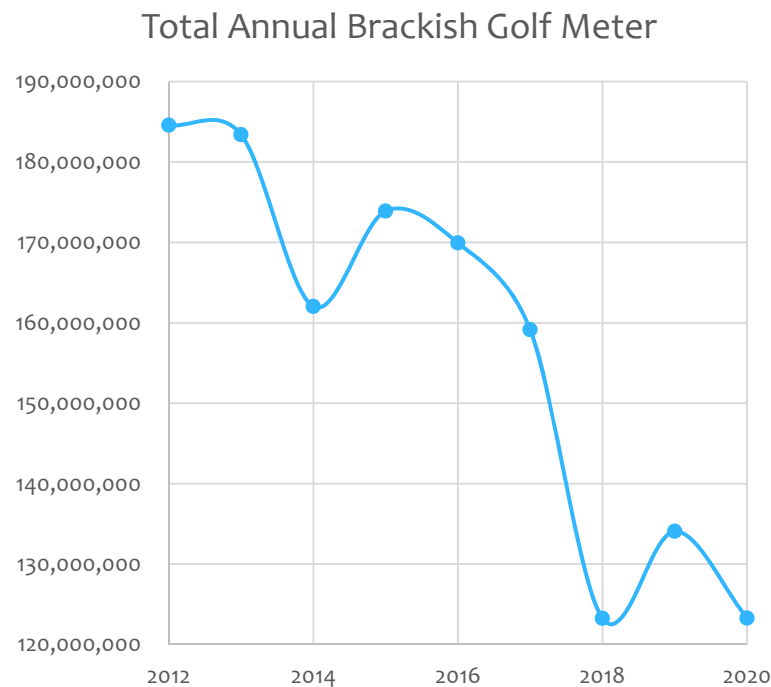


# Trend Analysis – 0.5% pumping reduction since change in ownership





# Traditional Waterline & Irrigation Improvements



- \* Miki Basin Waterline Replacement
- \* Smart Irrigation at the Manele Golf Course and replacement of irrigation system. Savings of 60M Gal/year.

# Understanding Existing Use

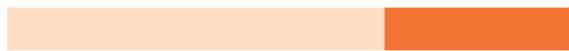
- \* Completed an AWWA Water Audit in 2017 utilizing 2016 data.
  - \* Non-revenue water higher than desirable.
  - \* Meters from the late 80s and 90s.
  - \* Antiquated utility billing system
  - \* Utility maps lacked water lines to existing meters and meter locations were tracked solely by the meter reader. 4 meter readers in a period of a little over 2 years.
- \* Primary focus in 2017/2018 was to improve the validity of the water audit data by focusing on water meters and utility billing.

# Smart Meters - Advanced Meter Reading

## Leak Count

180

Out of 1,712 Meters

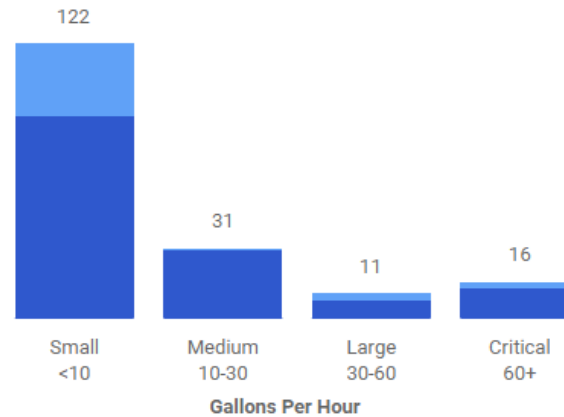


120 67%  
Without EyeOnWater

60 33%  
With EyeOnWater

## Leak Flow Rates

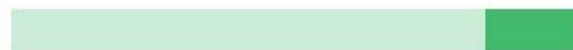
Over 7 Days New



## Accounts with EyeOnWater

17%

Out of 1,527 Accounts



1,267 83%  
Without EyeOnWater

260 17%  
With EyeOnWater

## User Count

126

EyeOnWater Users

Active in the last 30 days



Active in the last 24 hours



# Smart Meters – Eye On Water

## New Sign-ups

8

Sign-ups in Last 6 Months



\* Typically about 20 NEW leak letters mailed every month. Leak letters reset in January and everyone with an active leak receive a new letter. Typically around 250 letters a year in total.

\* DLNR provided a grant for partial funding of Phase II of the smart meters



# Customer Example



Why such a big jump in July?  
What happened in August?  
How do leaks act?

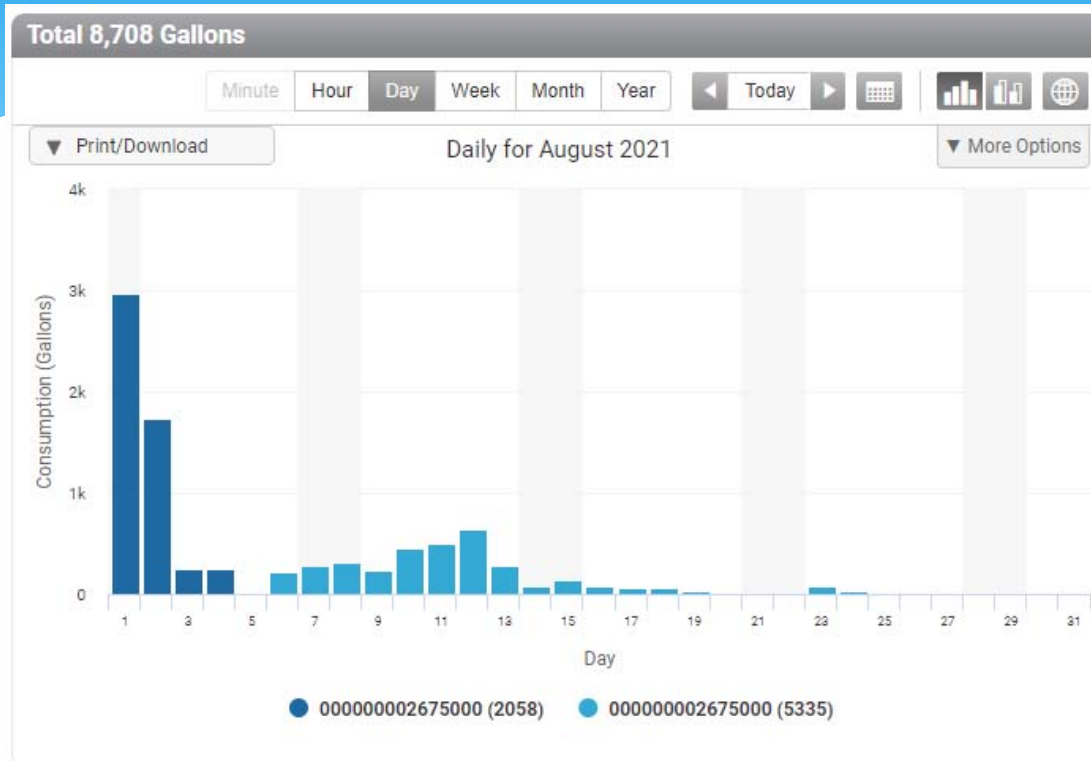
Cards

Sort By: Relevance

Login As Add Note Tags | 1 Edit Alert More

	<b>Aug 10-16</b> <b>2,164</b> Gallons	<b>Aug 17-23</b> <b>263</b> Gallons	<b>Account ID</b> 000026750000	<b>Class Code</b>	<b>Meter ID</b> 5335
			<b>Account Name</b> GANNON JOY	<b>Service Address</b> 812 PU'ULANI PL LANAI HI 96763	<b>Cycle</b> 2000
			<b>Service Agreement</b> Start: Jan 6, 2017		<b>Route</b> 2

# Customer Example



Leaking Toilet repaired at Beginning of the month.

Leak alert triggered.

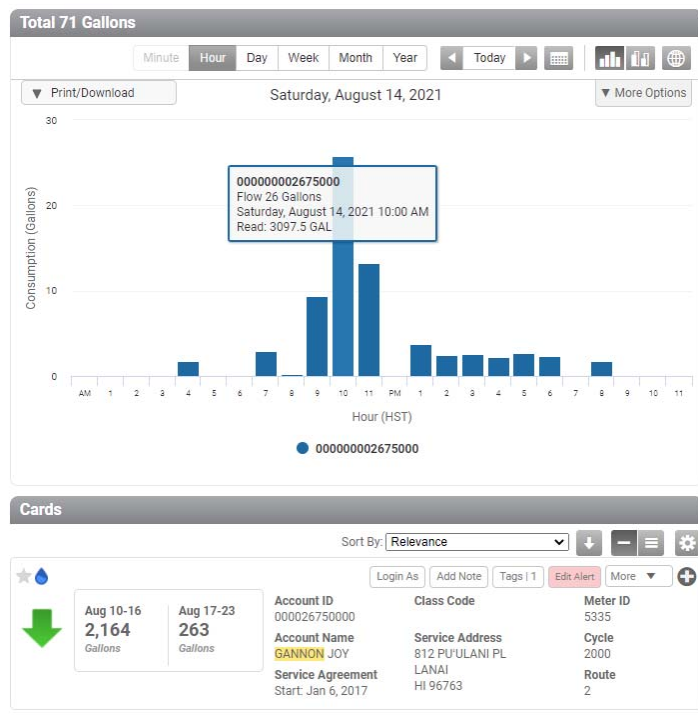
Sort By: Relevance

Login As Add Note Tags Edit Alert More

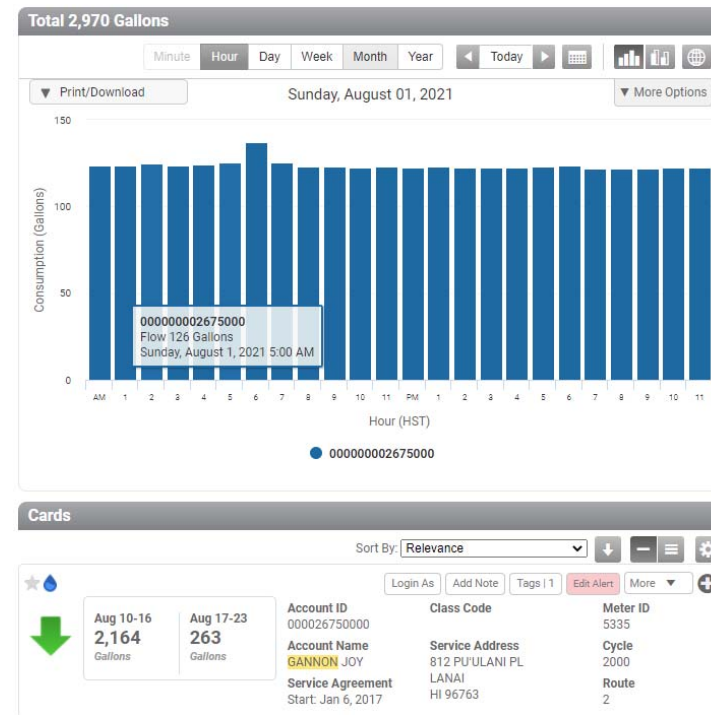
★	Aug 10-16 <b>2,164</b> Gallons	Aug 17-23 <b>263</b> Gallons	Account ID 000026750000	Class Code	Met ID 5335
↓			Account Name GANNON JOY	Service Address 812 PU'ULANI PL LANAI HI 96763	Cycle 2000
			Service Agreement Start: Jan 6, 2017		Route 2

# Customer Example

## Normal Day

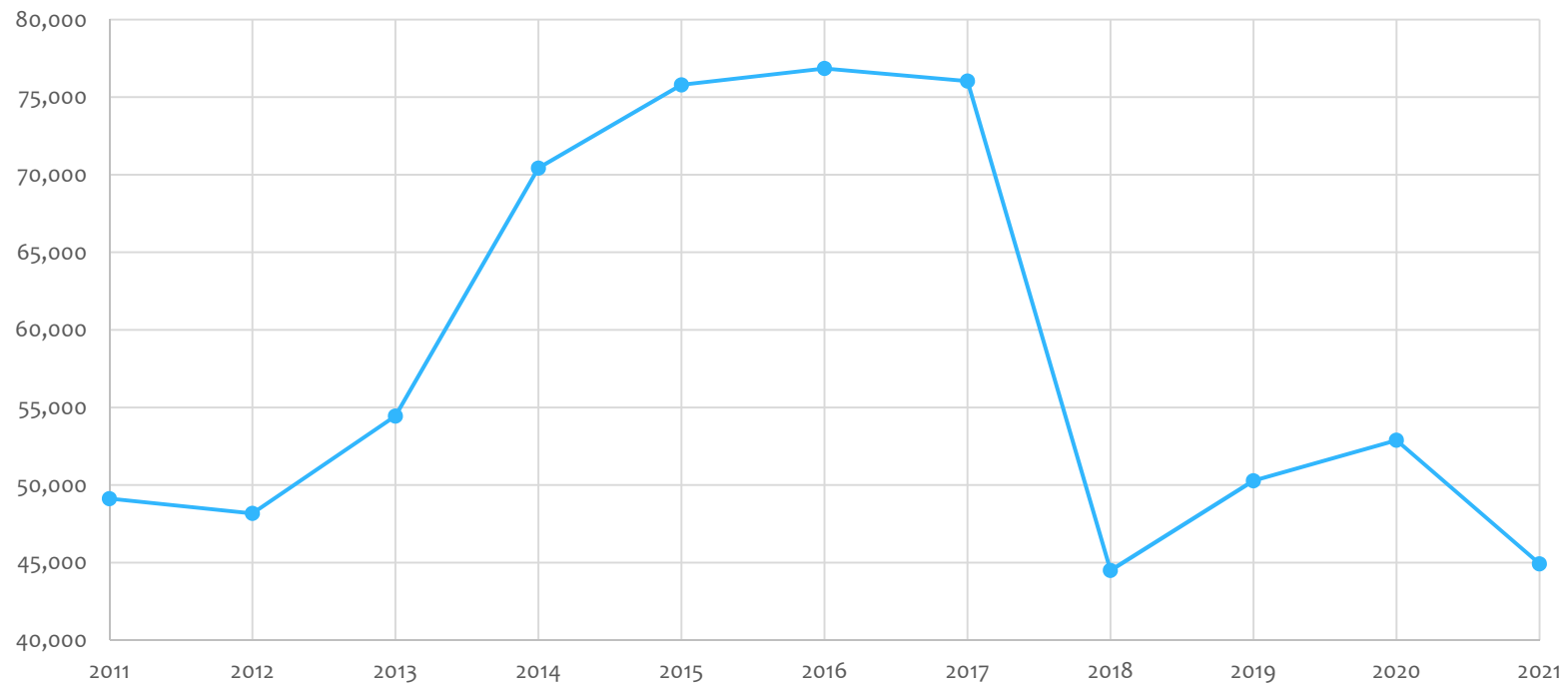


## Leak Day



# Smart Meters and Irrigation Use

Other Brackish Irrigation Roadside irrigation (GPD)





# Smart Meter Implementation

- \*  $\approx$  12 MG Year Brackish Water Savings
- \*  $\approx$  10 MG Year Drinking Water Savings
- \* Ability to set up leak notifications
- \* Underutilized – but once adopted – loved.

# Annual 3<sup>rd</sup> Party Validated Water Audits with CWRM



## Level 1 Validation Summary Notes/Certificate

This document includes detailed notes about utility practices as reviewed during third-party level-one water audit validation.

### Call Information

#### Utility

System Name: Lanai City (237)

Audit Period: CY2020

System Participants: Joy Gannon, John Bowman

Call Date: 7/6/2021

#### Validator

Validator: Neal Fujii, Nicholas Ing, Jeremy Kimura

Validator Qualifications: CWRM Staff

Validator General Comments: Comparing CY2019 with CY2020, WS decreased 25MG, AC decreased 2MG, Water Loss decreased 22.9MG. Apparent Loss decreased 9.6MG, Real Loss decreased 13MG. The causes of the discrepancy between WS and AC is unknown. The following activities were described by Lana'i Water Co. staff (e-mail):

- Throughout 2019, the large Koele Hotel was under construction and opened in December of 2019. There were a number of issues that occurred during construction including finding the contractor tapped into the system without a meter and damage to a large meter.
- The global pandemic greatly reduced all activity on the island including construction activity. Many of the water systems leaks are associated with construction traffic or activity. Without that activity, there was only one large leak on PWS 237 during 2020.
- We complete a monthly audit and are checking or replacing meters that have questionable or unusual reads. All major leak events are noted.
- We installed an additional tracking meter on the Kalamapau line in the vicinity of the cat sanctuary to identify a leak on the line in a more timely manner.

# 2020/2021 Changes - More tracking meters!

Total 221,049 Gallons

Map Satellite

Kaunapau Hwy

440

Kaupili Rd

Lanai Cat Sanctuary  
Rescue & care center for feral cats

Google

Keyboard shortcuts | Map data ©2021 Imagery ©2021, Maxar Technologies | Terms of Use

Cards

Sort By: Relevance

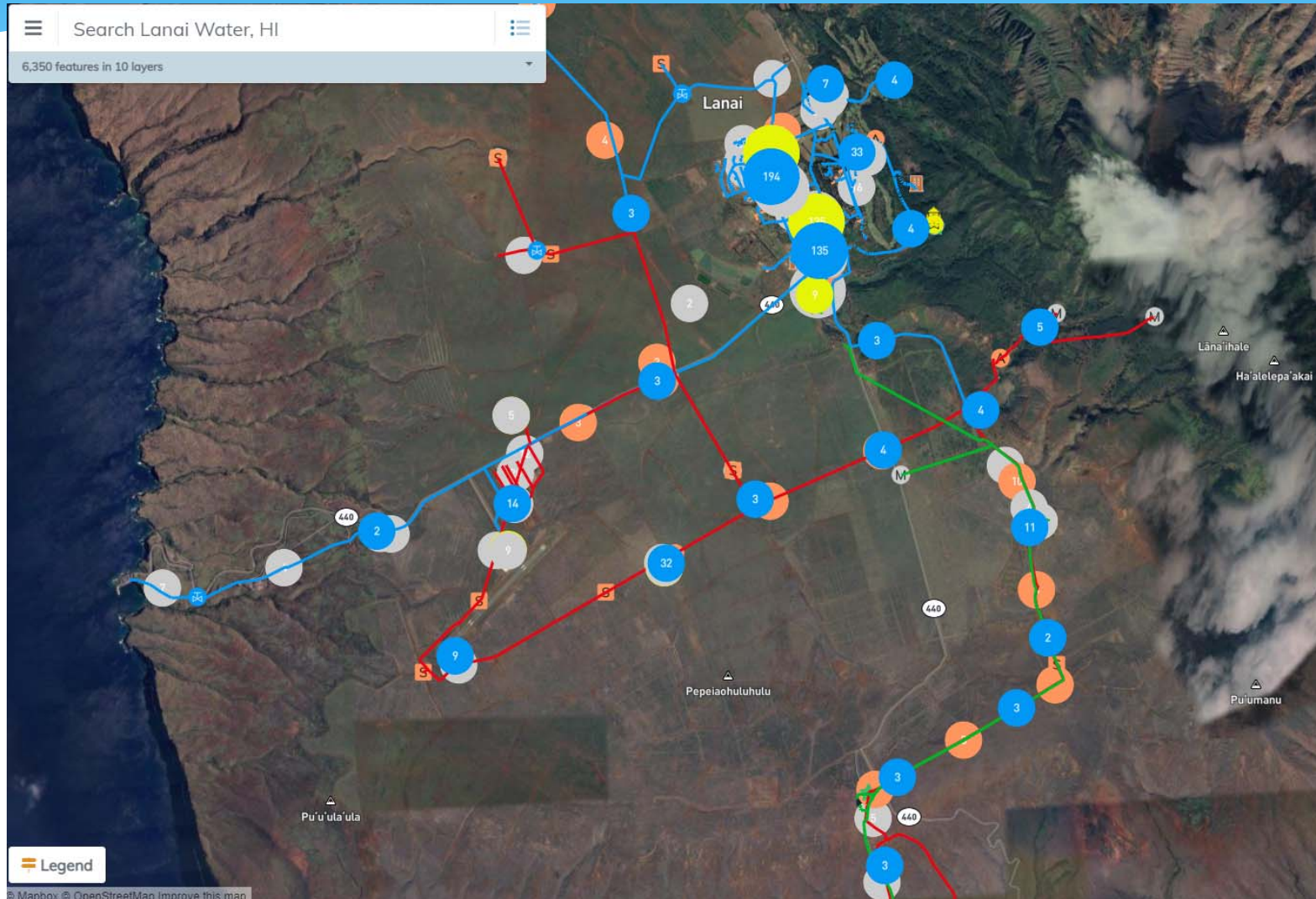
⚠ Leak Detected: 68 Gallons/hour beginning Mar 22, 2021 20:14 HST

★

Add Note Tags | 1 Set Alert More

Aug 31-Sep 6 <b>87</b> KGal	Sep 7-13 <b>129</b> KGal	Account ID 000095120230	Class Code	Meter ID 5203
Account Name LRL/UGA - UTILITIES	Service Address K-PAU TRACKING METER	Service Agreement Start: Dec 24, 2020	LANAI CITY HI 96763	Cycle LHI
				Route LHI

# 2020/2021 Changes – GIS System





# 2020/2021 Changes – GIS System

The image displays a GIS web application interface for 'Search Lanai Water, HI'. The main map area shows an aerial view of a residential area with a network of blue pipes overlaid. Numerous circular markers in various colors (yellow, blue, red, green) are scattered across the map, representing individual water features. A search bar at the top left contains the text 'Search Lanai Water, HI' and indicates '6,350 features in 10 layers'. A detailed data popup is open in the bottom right corner, showing the following information:

Field	Value
Pinhole Man	4356
Public Water System	237
Pipe Size	11
Pipe Type	Ductile Iron
Year Installed	1990
Length	649.87556649
Depth	0
Discussion	Add a comment



# 2021 Changes – Leak detection via drone flying over pre-loaded water map



# Redesign of SCADA – Supervisory Control and Data Acquisition



Verizon LTE VPN 1:15 PM 47%

Ignition! light

Well	Level	Status	Flow	Comm
1	INOP	HMI HAND	INOP	Good
2	118.4	HMI OFF	0	Good
3	99.9	HMI AUTO	0	Good
4	244.3	HMI AUTO	900	Good
6	41.1	HMI AUTO	288	Good
8	60.3	HMI AUTO	582	Good
14	INOP	HMI OFF	INOP	Good
15	478.5	HMI HAND	376	Good

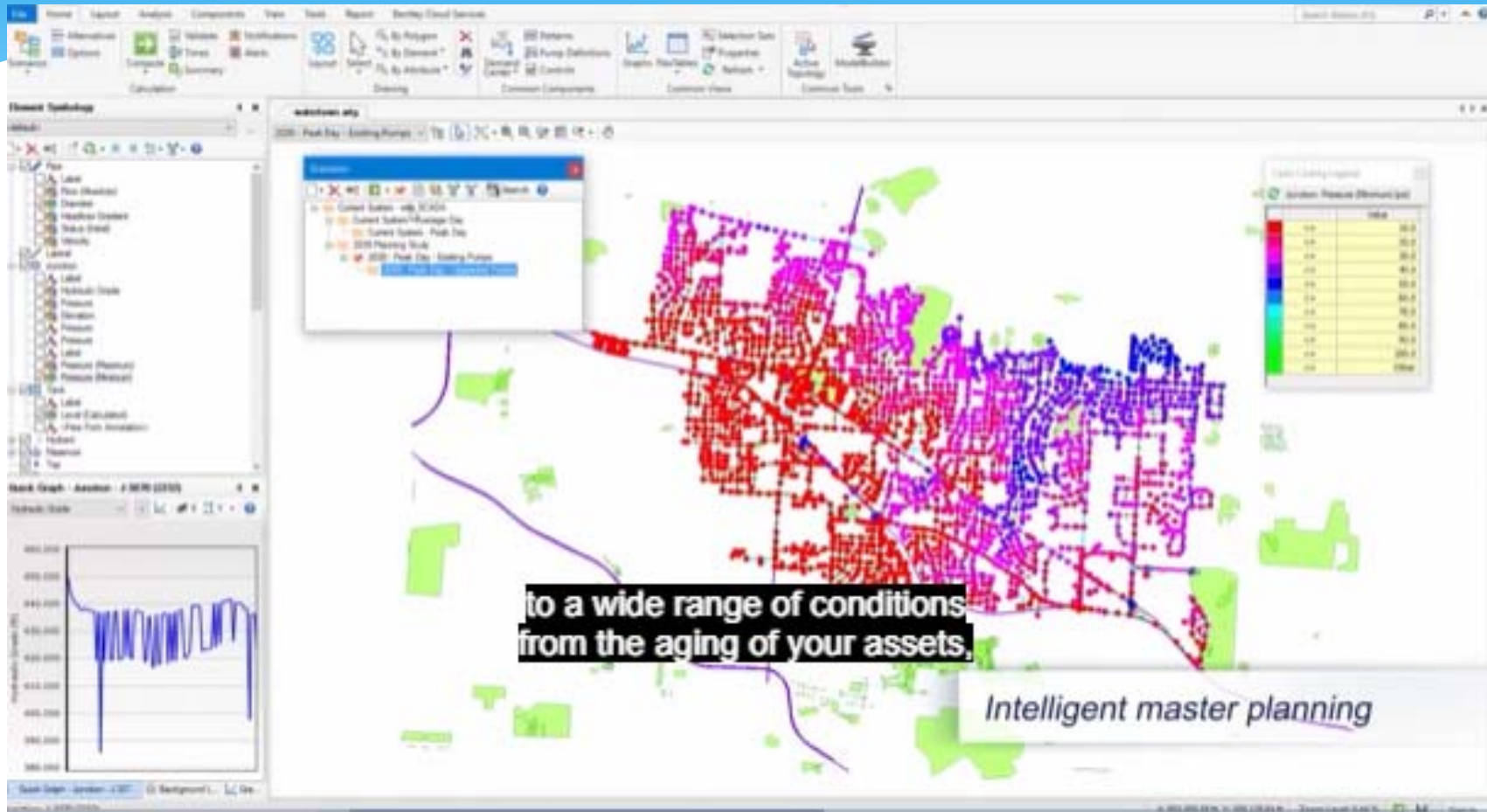
  

Tank	Level	Comm
2MG City	32.4	Good
Koele	27.7	Good
KPau	13.3	Good
Hii	20.8	Good
HB1	12.1	Good
HB2	11.1	Good
HB3	11.2	Good
Manele Res	17.0	Good

↑



# 2020/2021 Changes – Hydraulic Water Models



<https://www.bentley.com/en/products/product-line/hydraulics-and-hydrology-software/watercad>

# Living Document

Lanai Water Company  
Water Conservation Plan Update  
2019





Questions?