# FLORIDA RURAL WATER ASSOCIATION 2024 Daytona

Master Planning, Whole of Life Costs, Advances in Technology

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Founder and President

Flovac Vacuum Sewer Systems

# Septic to Sewer
## GUIDANCE DOCUMENT

APRIL 2018

Prepared by: JonesEdmunds

On behalf of: Florida Water Environment Association UTILITY COUNCIL

Prepared for: Florida Department of Environmental Protection



## Sewer Technologies – Cost Comparisons

| Sewer System Technology | On-lot/ERC* | Project Cost/ERC | Annual O&M Cost/ERC | 40-Yr Present Worth/ERC |
|---|---|---|---|---|
| Low Pressure (STEP) | $7,675 | $13,200 - $14,250 | $870 - $980 | $30,740 - $32,700 |
| Gravity | $2,258 | $20,000 - $23,300 | $270 - $380 | $27,600 - $30,900 |
| Vacuum | $2,258 | $13,200 - $15,000 | $420 - $540 | $21,100 - $25,500 |

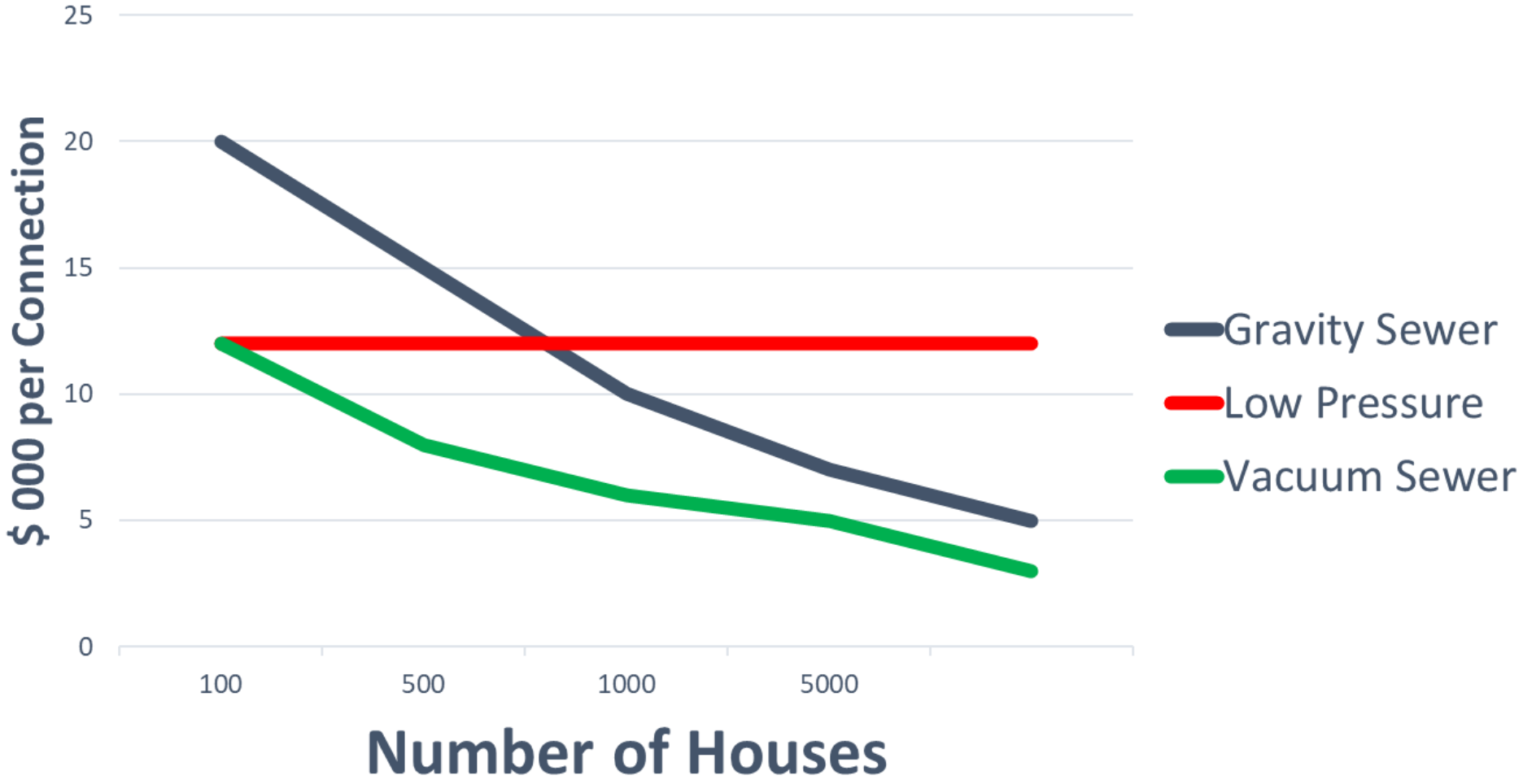
Assumptions:

1. * - On-lot costs shown without construction contingency.
2. Average lot frontage is 80 feet
3. At least 350 lots
4. All lots developed
5. Interest: 4%

According to EPA's Informational Overview on Water and Wastewater Pricing (Office of Wastewater

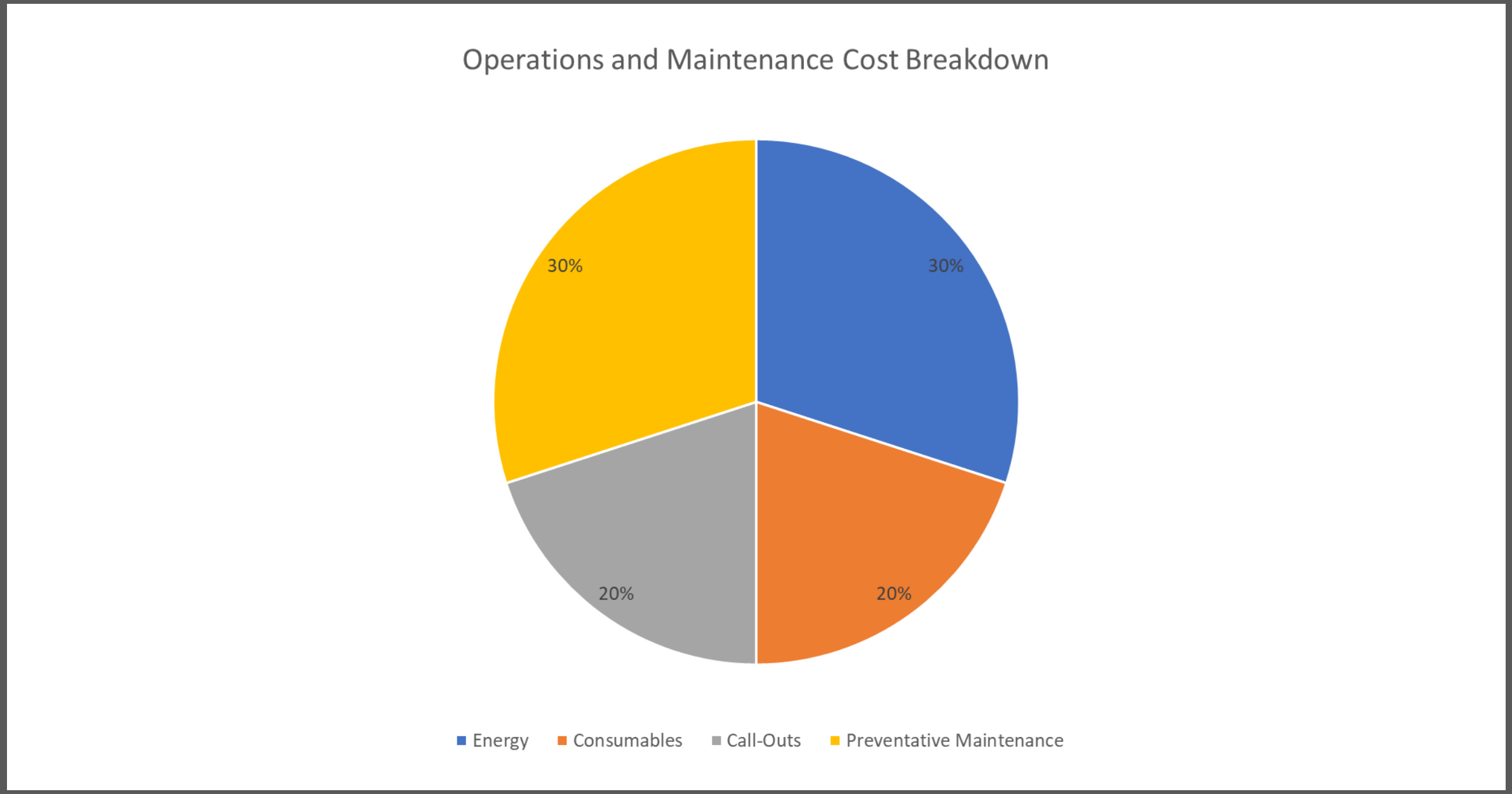
household income in this country (Congressional Budget Office, Future Investment in Drinking Water

# Capital Cost per House per Sewerage System Type




** Based on a typical high-water table/flat terrain project, dealing in difficult ground conditions*


Master Planning
Number of Gravity Pump Stations
Number of Vacuum Stations
Number of Grinder Pumps
Number of Vacuum Collection Pits


Operations and Maintenance Cost Breakdown
30%
30%
20%
20%
Energy
Consumables
Call-Outs
Preventative Maintenance

# Florida Administrative Code

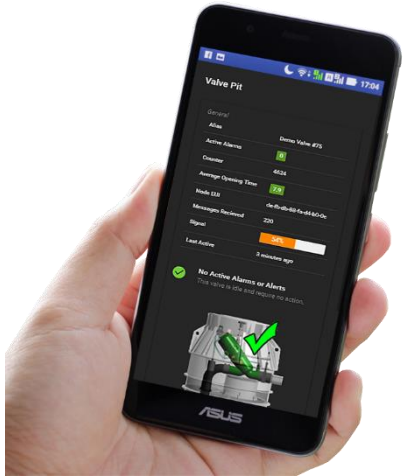
## 62-600.705 Collection/Transmission Systems

### Proactive Approach to System Evaluation:

The regulations require a deliberate and proactive approach to evaluating the collection/transmission system, including pipes, manholes, pump stations, and other equipment over a 5-year planning horizon. This is to be done using various investigative techniques to detect infiltration, inflow, and leakages. Vacuum sewer systems, with their ability to provide precise and real-time data on system performance and integrity through wireless monitoring, align perfectly with these requirements by enabling early detection of potential failures or infiltration

# Features in Vacuum Monitoring

- Valve Status
- High Level Alarms
- Vacuum Levels
- Remotely Valve Activation
- Battery operated
- Easy Installation
- Logging



# ENERGY COSTS 30%

## Costs

Sewage Pump Costs

Too Much Liquid

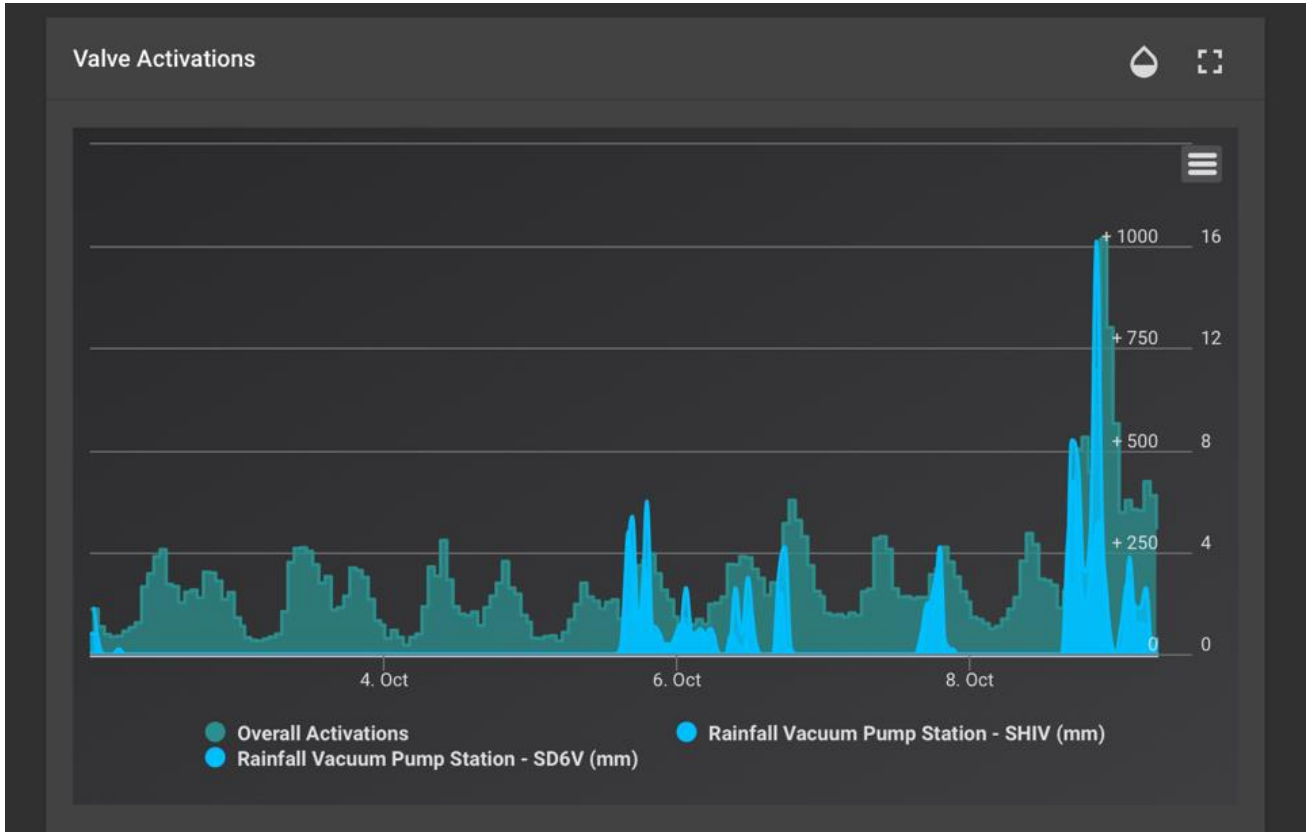
Vacuum Pump Costs

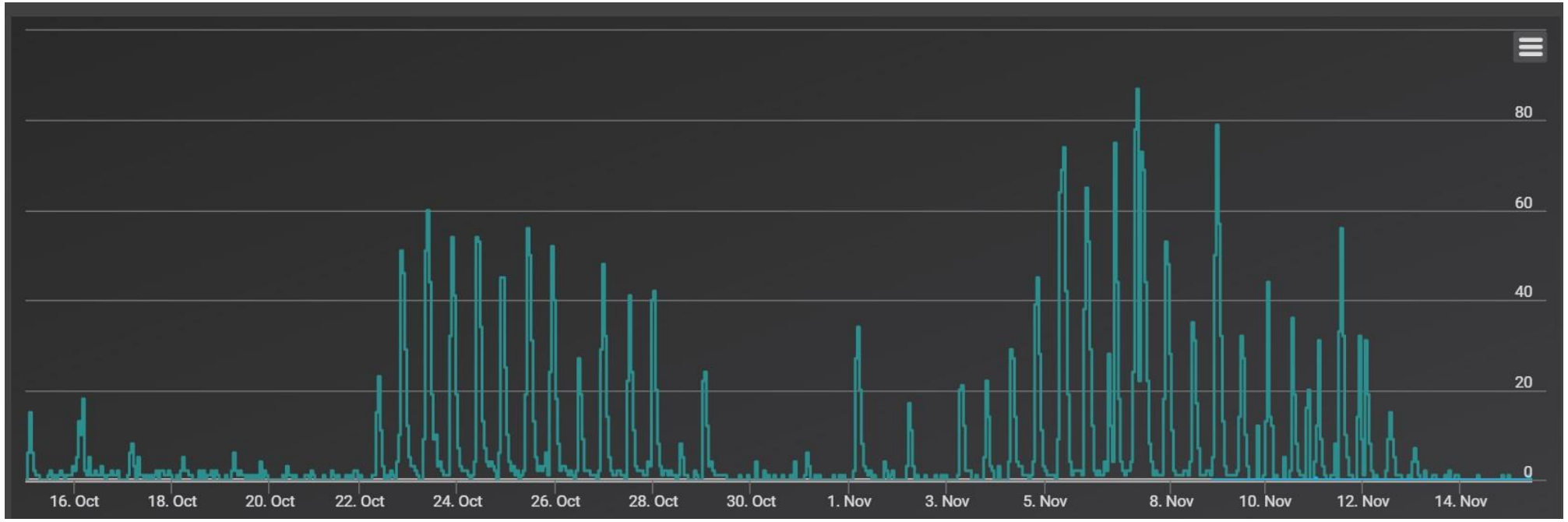
Too Much Air

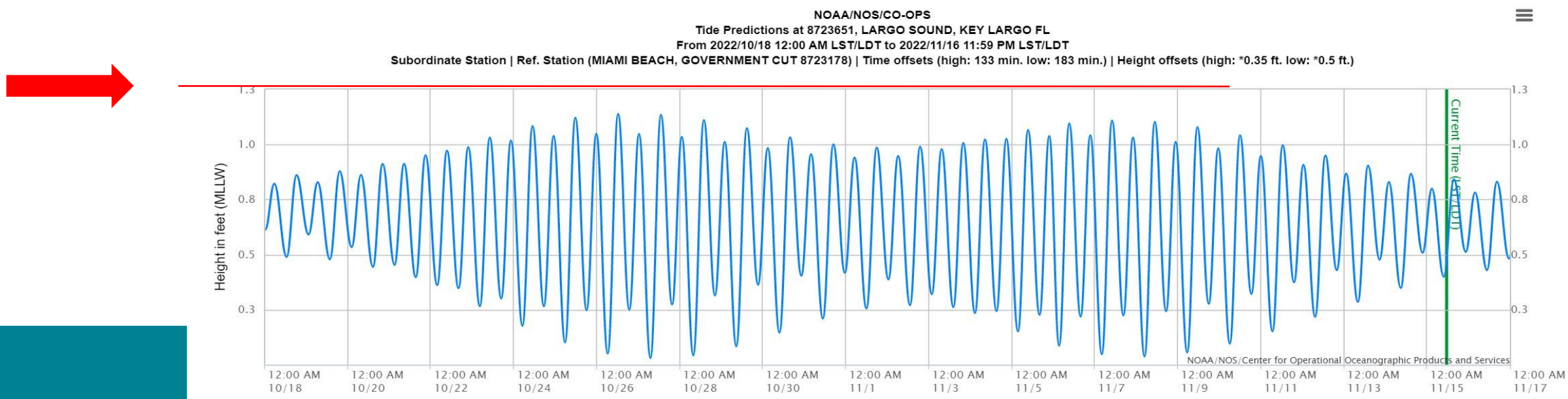
## Causes

Infiltration & Inflow (I&I)

Tuning of the System correcting the air to liquid ratio



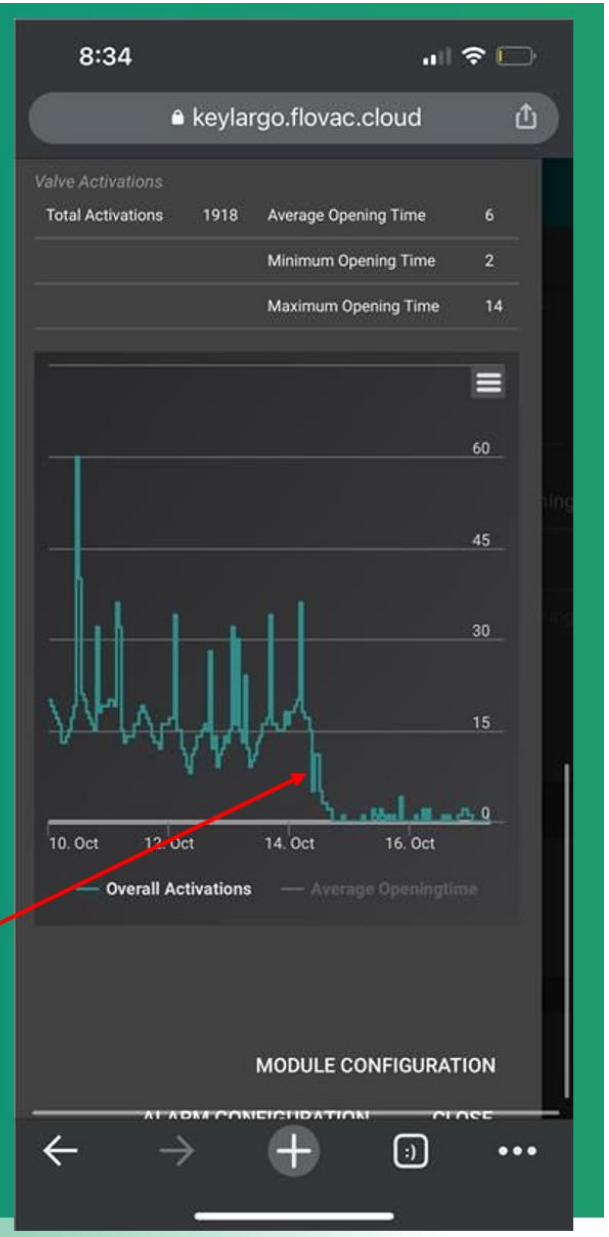

80
60
40
20
0
16. Oct
18. Oct
20. Oct
22. Oct
24. Oct
26. Oct
28. Oct
30. Oct
1. Nov
3. Nov
5. Nov
8. Nov
10. Nov
12. Nov
14. Nov


NOAA/NOS/CO-OPS
Tide Predictions at 8723651, LARGO SOUND, KEY LARGO FL
From 2022/10/18 12:00 AM LST/LDT to 2022/11/16 11:59 PM LST/LDT
Subordinate Station | Ref. Station (MIAMI BEACH, GOVERNMENT CUT 8723178) | Time offsets (high: 133 min. low: 183 min.) | Height offsets (high: *0.35 ft. low: *0.5 ft.)
Height in feet (MLLW)
1.3
1.0
0.8
0.5
0.3
Current Time (LST/LDT)
NOAA/NOS/Center for Operational Oceanographic Products and Services
12:00 AM 10/18
12:00 AM 10/20
12:00 AM 10/22
12:00 AM 10/24
12:00 AM 10/26
12:00 AM 10/28
12:00 AM 10/30
12:00 AM 11/1
12:00 AM 11/3
12:00 AM 11/5
12:00 AM 11/7
12:00 AM 11/9
12:00 AM 11/11
12:00 AM 11/13
12:00 AM 11/15
12:00 AM 11/17


Flow:
7000+ Gallons collected per day.

Cause:
Broken PVC wye fitting located along a gravity lateral adjacent to the valve pit.

Reductions in valve activations (flow) once fitting was replaced



# Consumables 20%

## Collection Network

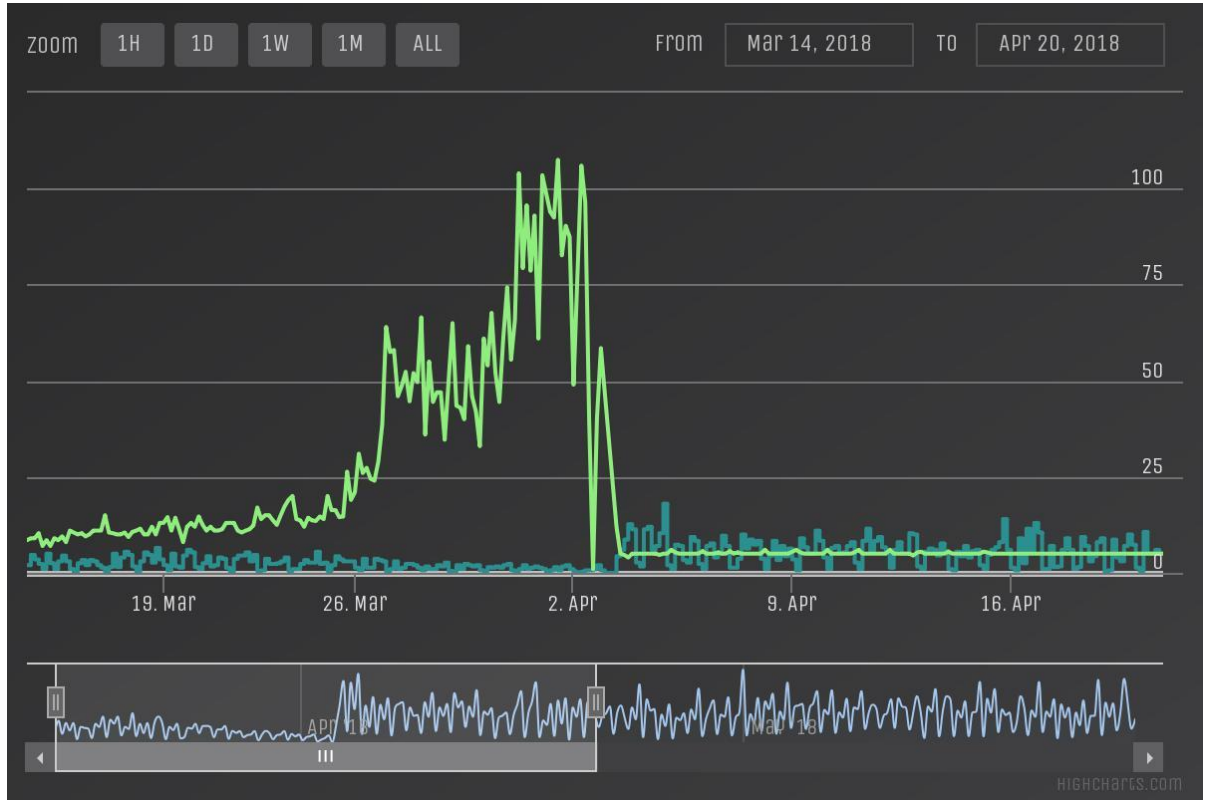
Vacuum Valve and Controller Replacement Parts

- Every 10 Years
- Under $100 plus time

## Vacuum Pump Station

Vacuum Pump Oil and Filters

- Alternate Pumps or better Tuned System



Create Event

Maintenance Task Comment

Assign To

High Priority

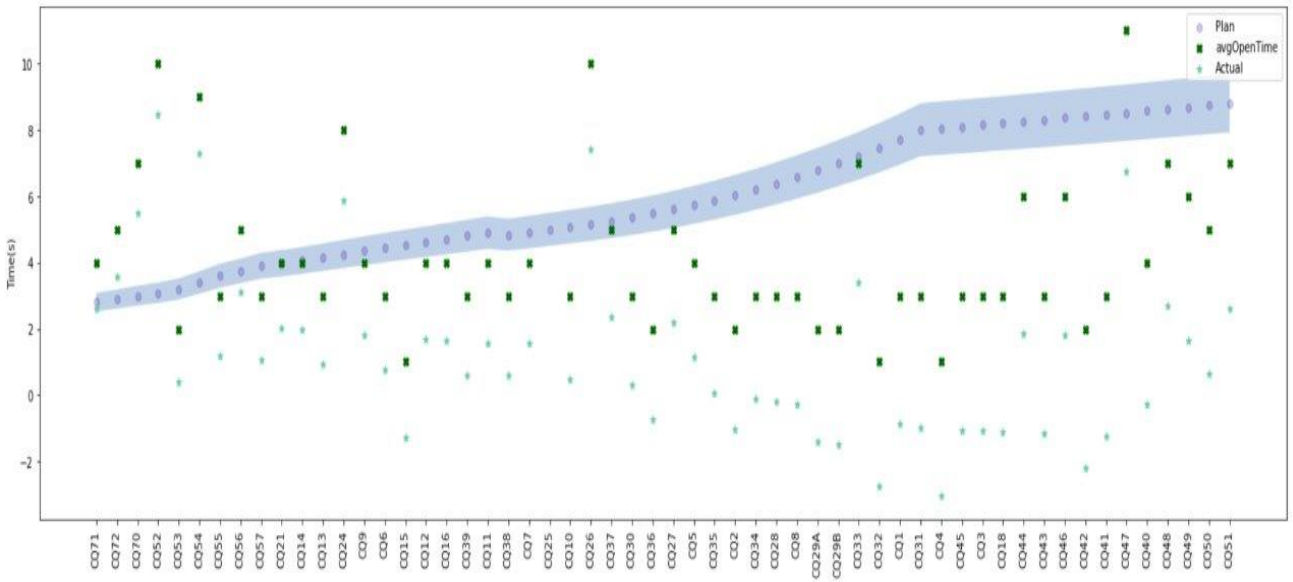
Message

Advised Controller Timing = 5 seconds

Controller SN: FV899472, Cycles Since install 5,239
Valve SN: FV204589, Cycles since install 2,386
Controller

ATTACH PHOTOS

BACK SAVE



# Call Outs 20%

## Time Spent

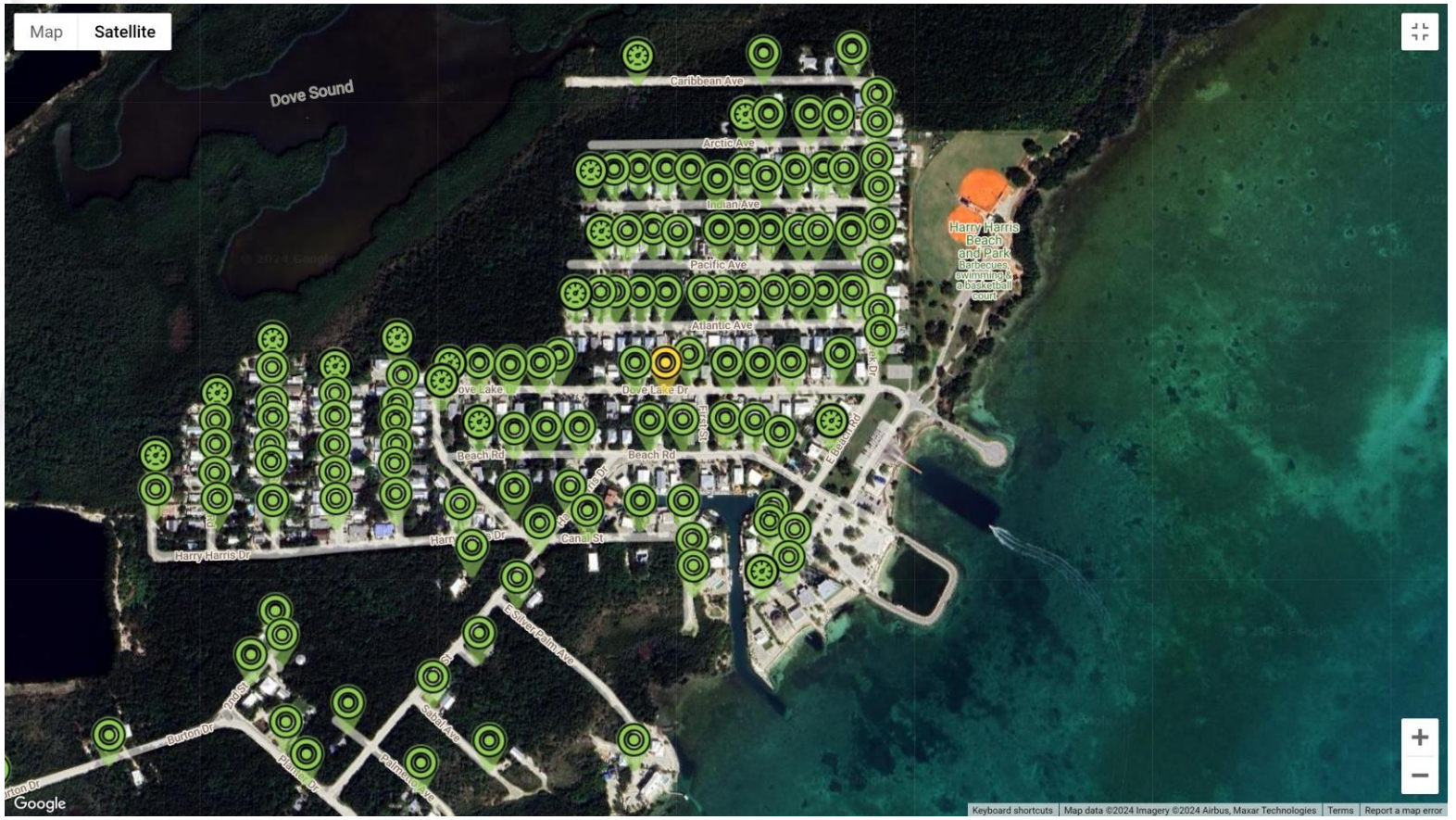
Locating System Problems

## Major Weather Events

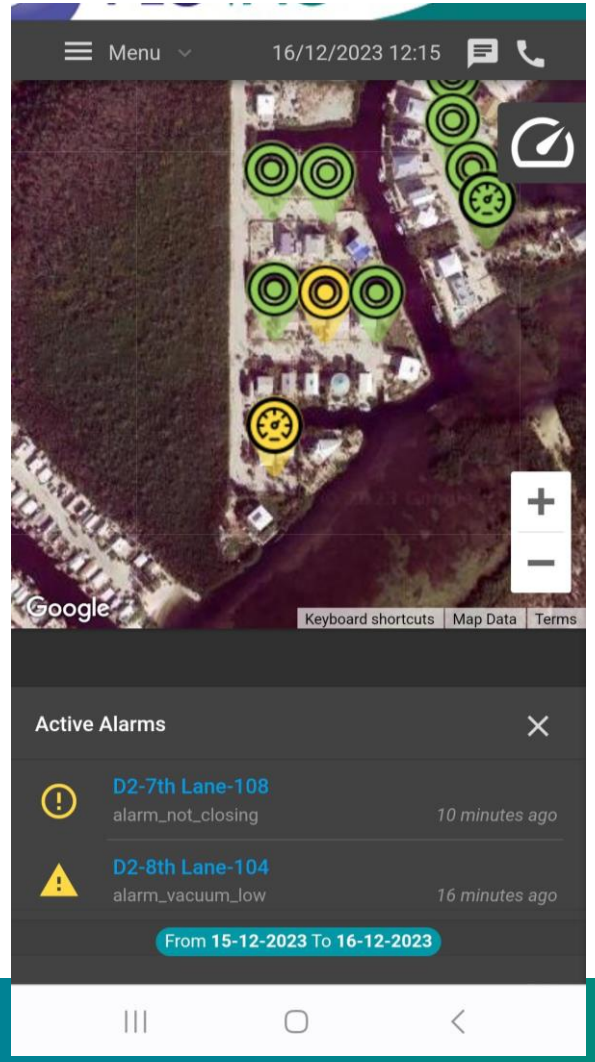
System Resilience

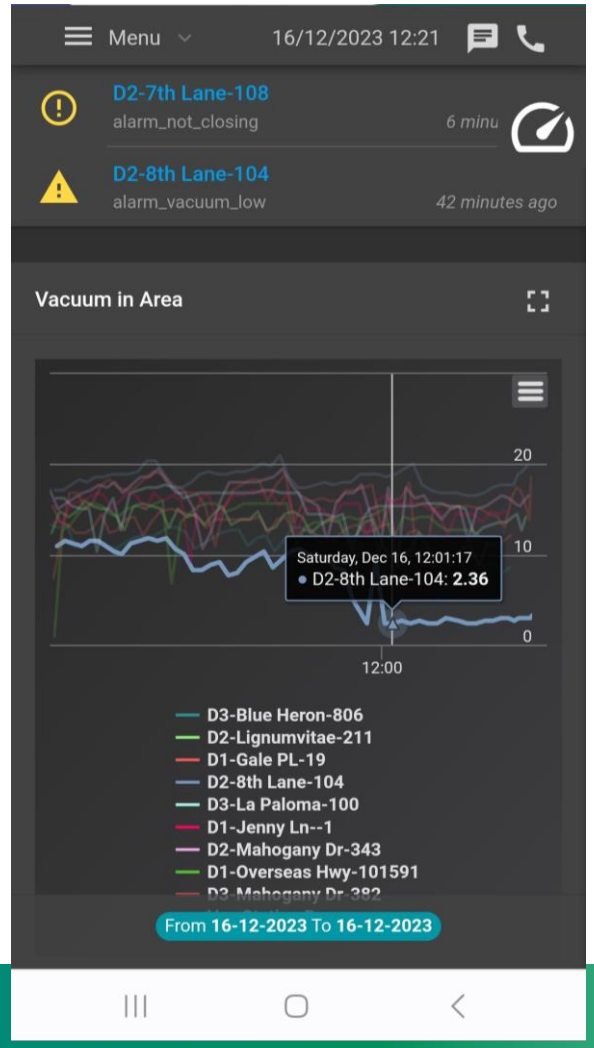
Hurricane Hardness

Flood Resistant



# Hurricane Hardness
# Key Largo





It's hung open it's the valve. Pits about 4 inches underwater. Headed to get a ring to pump it out.

Station cycled even with the pit hung open.

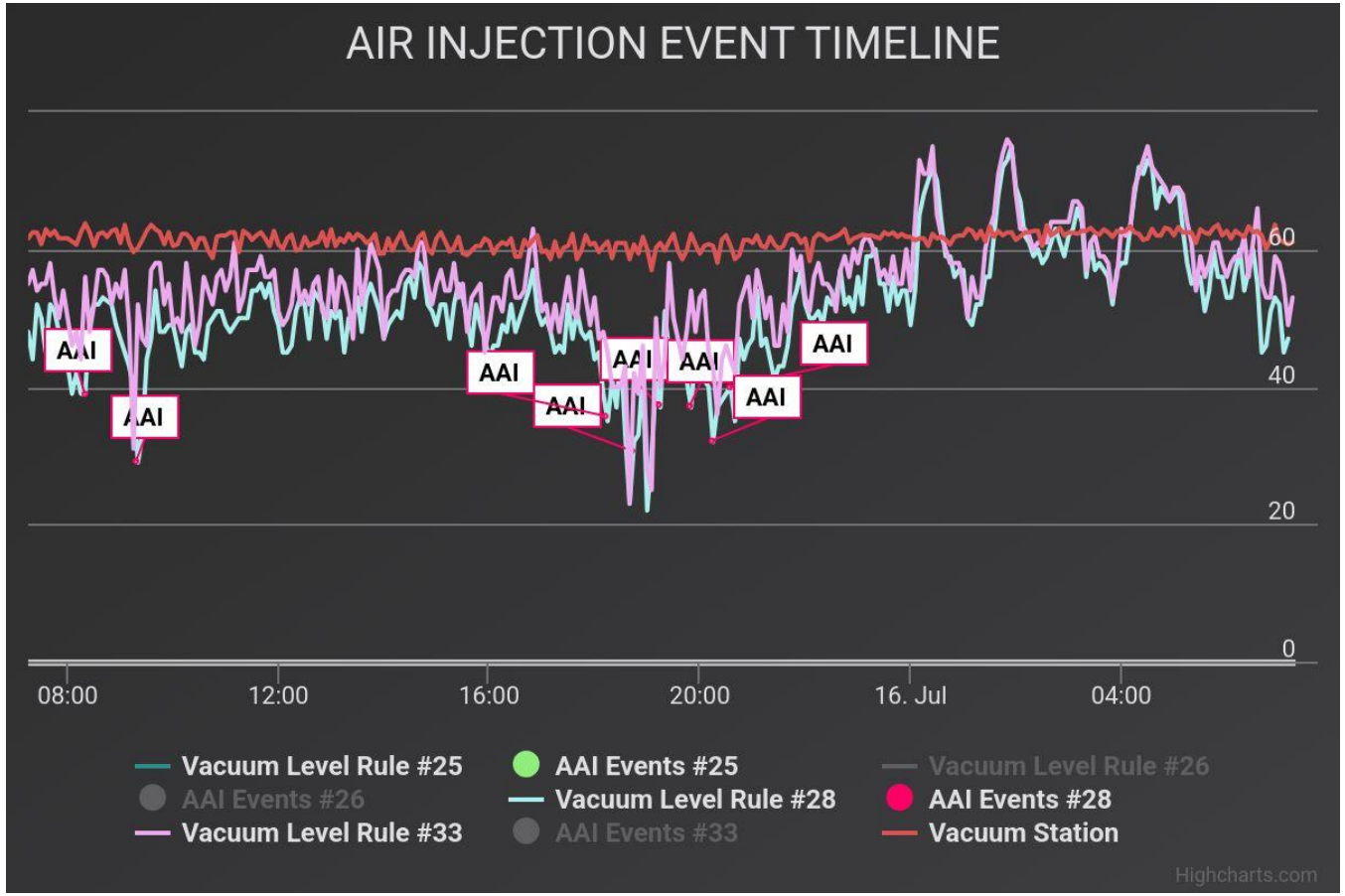
# Preventative Maintenance 30%

## Reactive

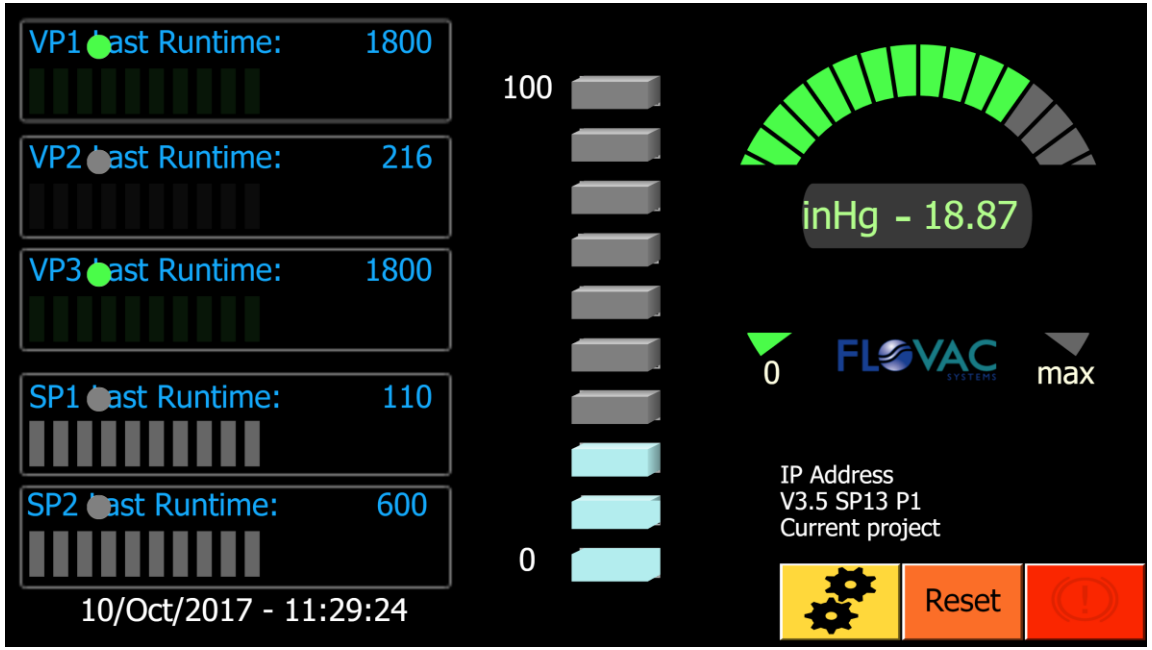
Wait till there is a problem

## Proactive

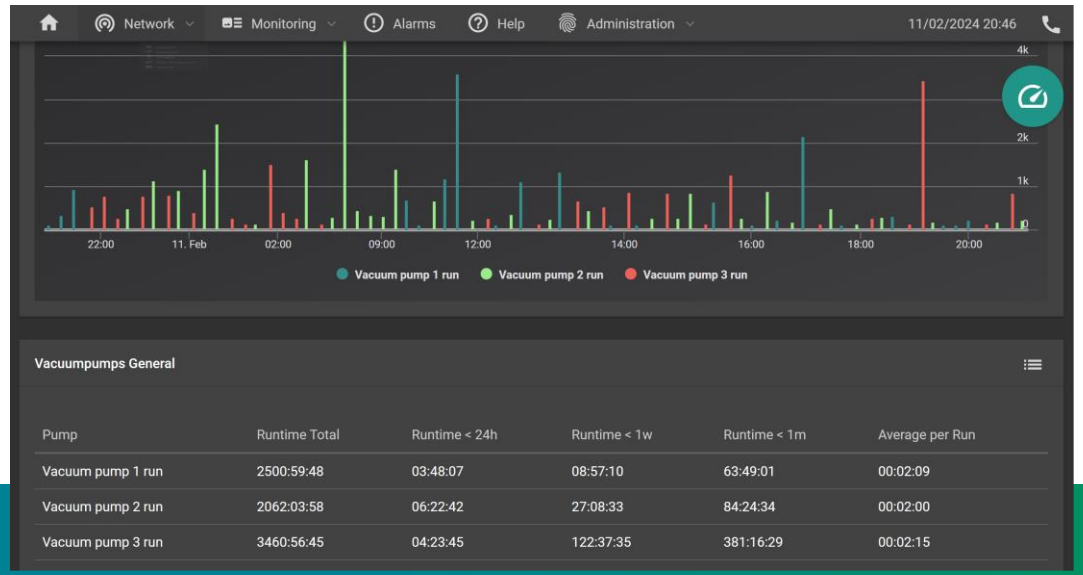
Be aware of a potential change in your network

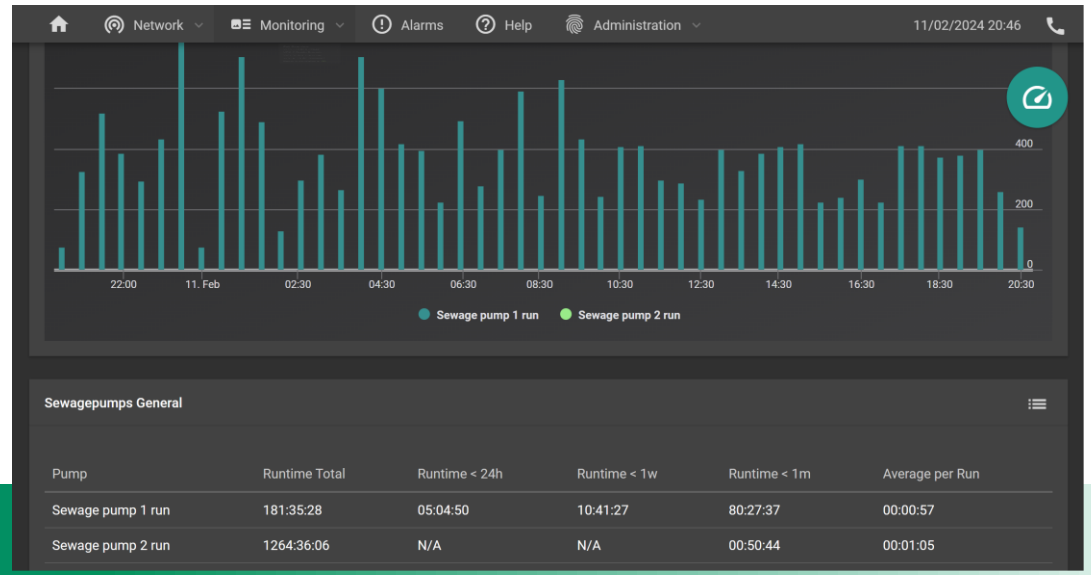


# Station Monitoring








FLOVAC
VACUUM SEWERAGE SYSTEMS