

Creating a Perfect "View" of Municipal Assets



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Case 1: City of Boca Raton Florida

The Boca Raton Wastewater Treatment Plant is part of the city's Utility Services complex situated on Glades Road near Interstate 95. The plant meets the city's wastewater treatment needs while minimizing environmental impact, including operating a 100% reuse system



Waste Water Treatment

- Service Population: 86,000
- Wastewater Plant: 17.5 MGD Capacity
- Lift Stations: 240
- Lime Softening Plant: 30 MGD
- Nanofiltration plant: 40 MGD

Boca Raton – Opportunity

In 2011 the Boca Raton utilities were controlled by GE Proficy iFix SCADA platform. The existing solution had over 22,000 tags but the Classic Ifix Historian was limited to 2500 tags.



Need

“We needed the ability to collect, store and monitor all 22,000 tags to provide both real-time and historical data access and trending capabilities.”

Boca Raton – Solution

After evaluating GE's newly released iHistorian and other alternative platforms the team ultimately selected and implemented the Canary Historian.

Canary Historian Benefits

- Provided the ability to Collect and Store all 22,000 tags.
- Scalable for future growth.
- Support for redundant historians.
- Open Data Access
- Trend Link a thick client trending control that could be embedded in the GE Proficy iFix displays.



Case 2: City of Lake City – The Gateway to Florida

The City of Lake City is located at the intersection of Interstate 75 and Interstate 10 and is therefore known as "The Gateway to Florida."



City Facts

- Population – 12,600
- Deep Civil War history, including the Battle of Olustee, the largest Civil War battle fought in Florida.
- The City offers outdoor activities like hiking, fishing, and tubing at Ichetucknee Springs State Park.
- The area also has many natural springs.
- Come and Visit!

Water & Wastewater Treatment Utilities

The City has 1 Water Treatment plant and 3 Wastewater Treatment Facilities.



Price Creek Water Treatment Plant

Price Creek WT

- 20,488 Service Customers
- 4 Ground Wells
- Ozone Treatment - Disinfection
- Chlorine and Ammonia Injection
- Phosphate Injection

Saint Margarets WWT: Aeration 3.0 MGD

Kicklighter WWT: Aeration 3.0 MGD

North Fl Water WWT: 4 Stage .5 MGD Bardepho Process Plant

Distributed Lift Stations: 64

Initial Challenges

Control systems were acquired over time with no established OT standards. Each site is unique and requires various system drivers.

Existing SCADA & Control Solutions

- Kicklighter WWTP: Ignition
- Price Creek WTP: GE Proficy iFix
- Saint Margarets WWTP: Currently installing SCADA system with Ignition.
- North Florida Mega MPI: VTScada
- Lift Stations: Dataflow HT4
- Weather Station: Columbia Weather
- Rockwell Hardware: PLC's & Power Meters.

Wastewater Treatment Plant



Opportunity & Goals

There was an opportunity to improve operational performance if we could centrally collect, store and analyze data from all site systems in one centralized and accessible platform.

Goals

- Make all SCADA data available to supervisors at the administrative level without compromising network security.
- Get everyone on board with the Idea – IT department and plant Operations are the biggest hurdles.
- Ensure that the solution was completely secure. (Recent Ransomware attack – Strict guidelines must be met.)
- Ensure that the final solution is simple and easy to use.
- Leverage graphical displays to aid user navigation.



Solution

Implement a Enterprise Historian on the enterprise network to collect data from all underlying control systems and devices to make all data available to management and plant operations without creating vulnerability on the SCADA network.

Canary Selection

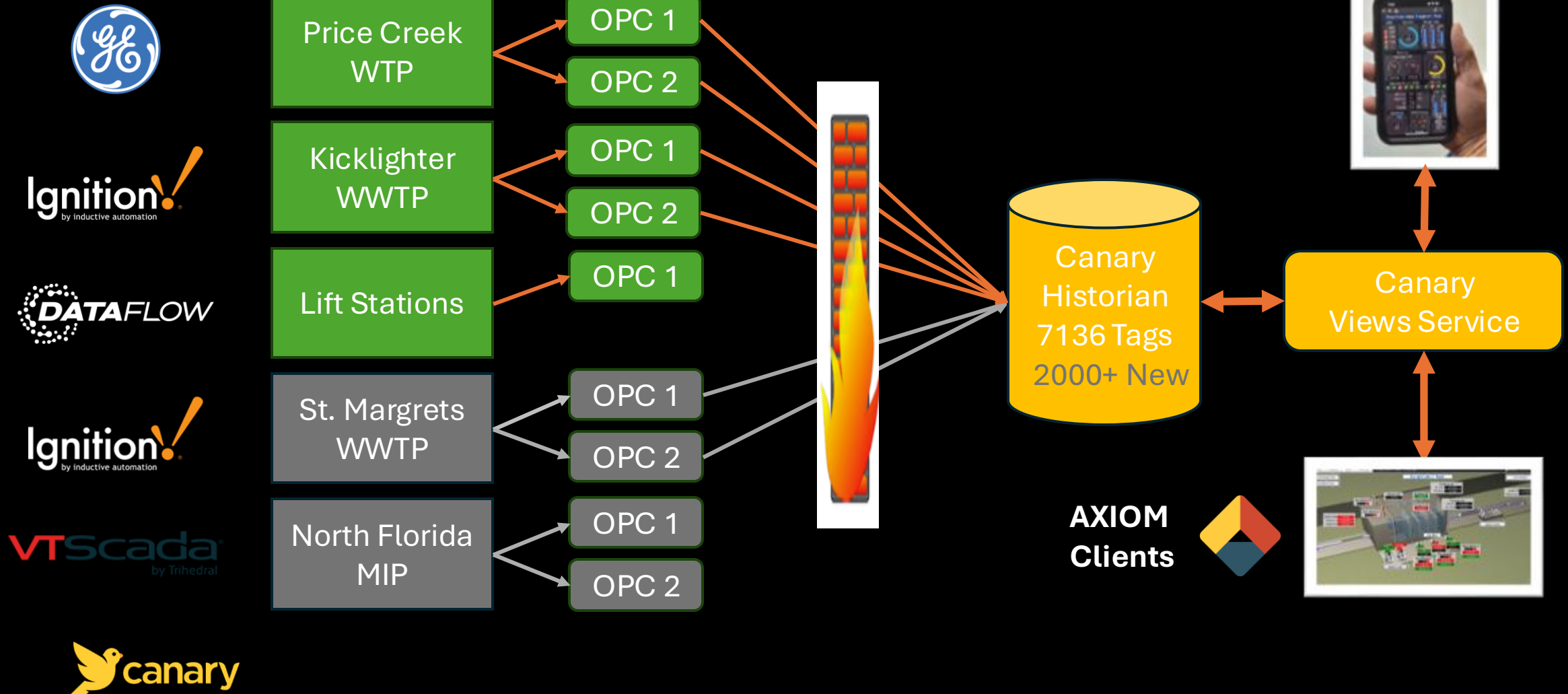
- Previous experience and success with Canary at my previous position for the City of Boca Raton.
- Ability to meet challenges and goals.
- Flexibility of Axiom to create graphical displays similar to existing SCADA displays.
- High Level of security with ISP and data encryption support.
- Open Data Access to support integration and data sharing with third party solutions.



Basic Architecture

Control Network

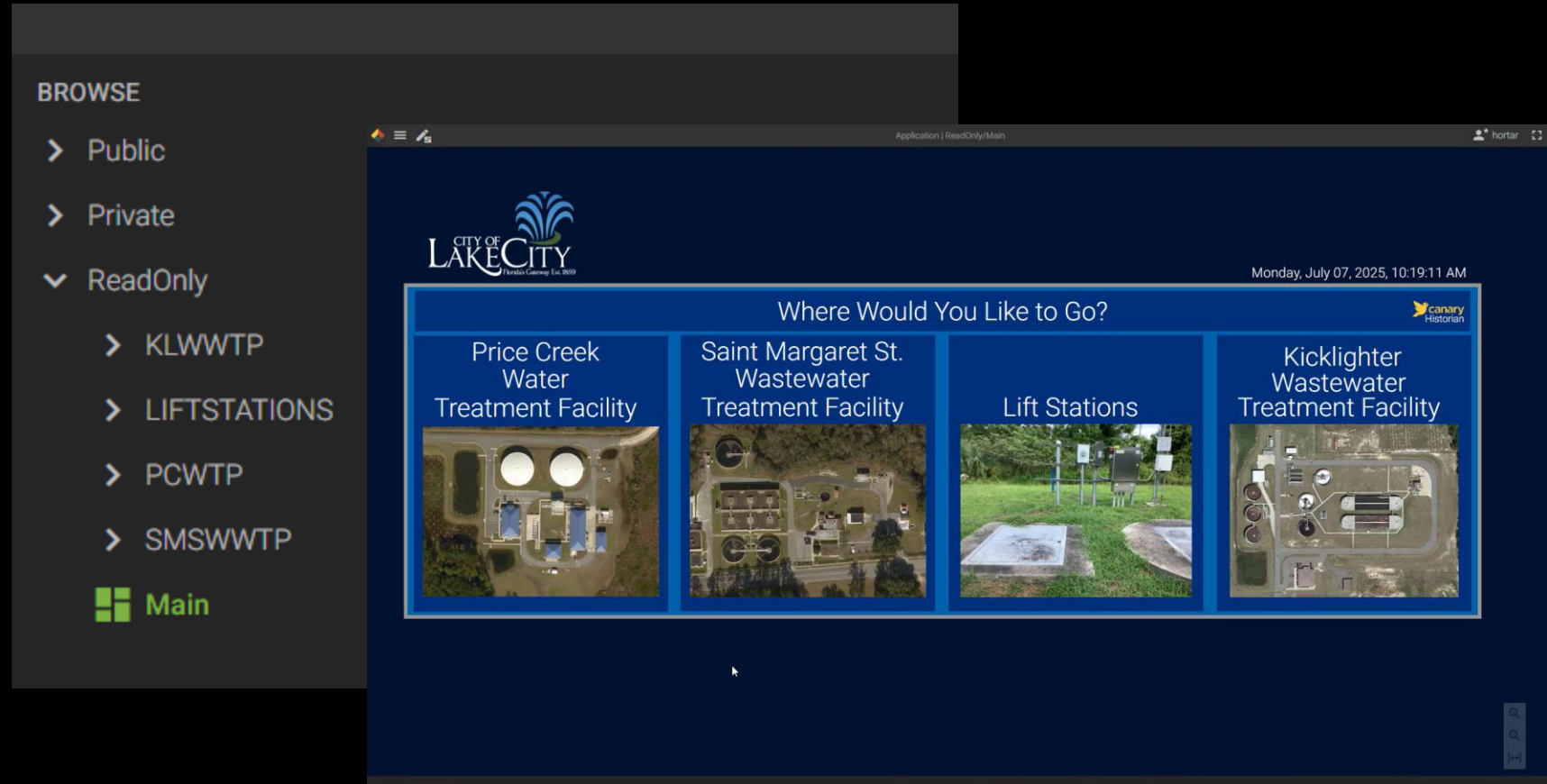
Enterprise Network



Axiom - Main Navigation Screens

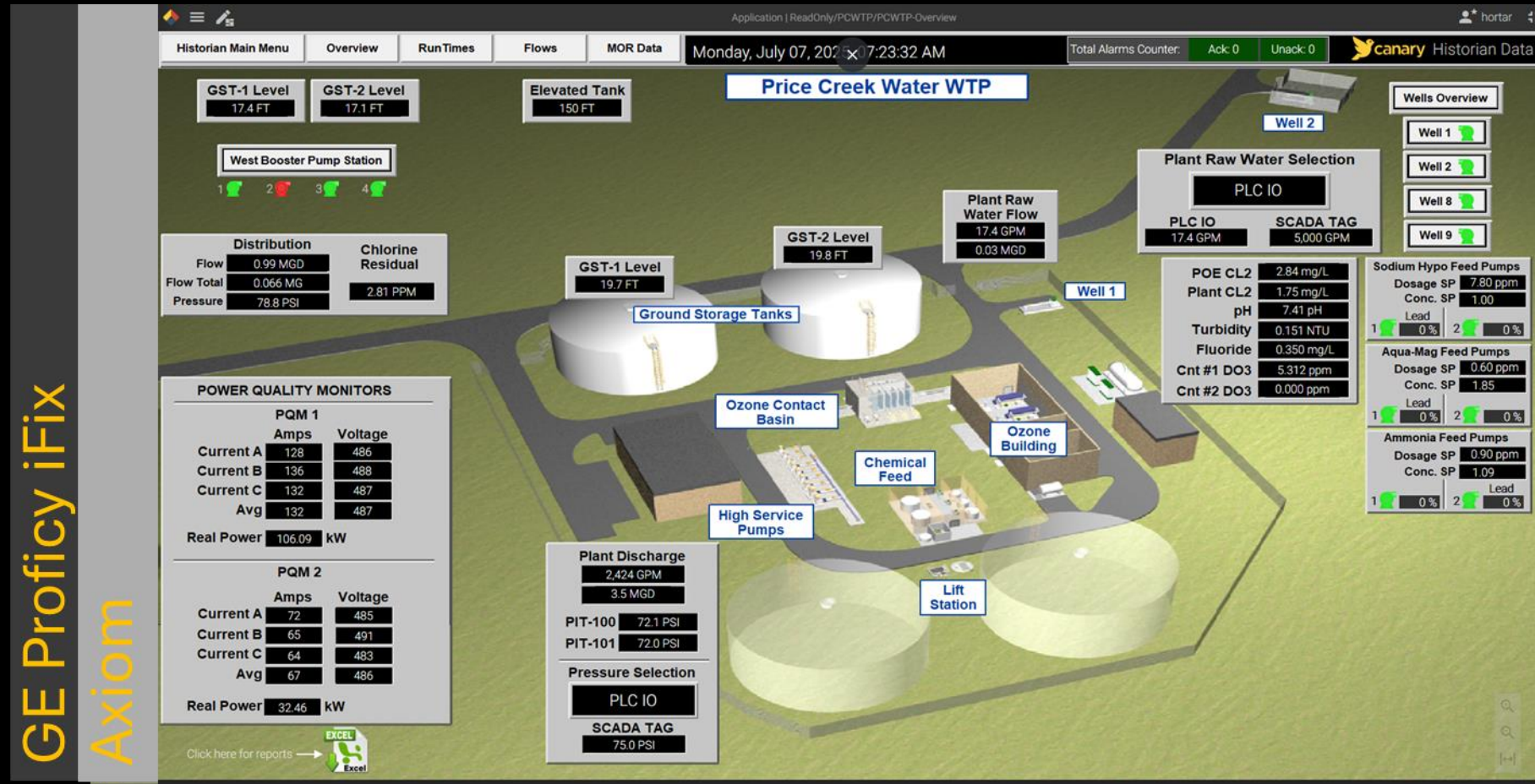
Design Goals

- Easy to Navigate
- Visual to provide users with physical location awareness.
- Graphics are Drillable to dive deeper into each asset.



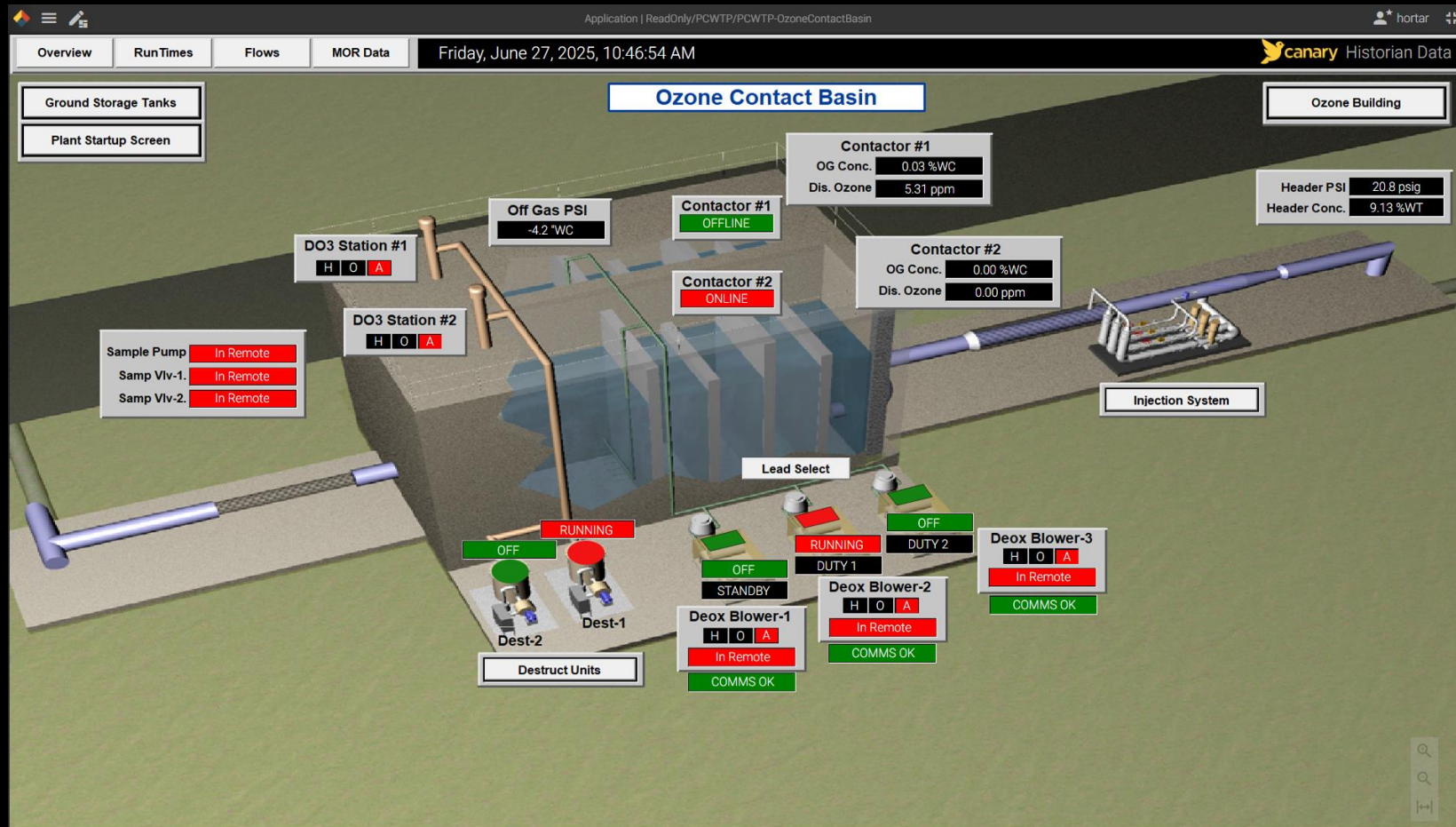
Price Creek Water Treatment Plant Overviews

Graphical displays were designed to look similar between the Ignition SCADA system and Axiom.



Price Creek - Ozone Treatment Contact Basin

Graphical displays are Drillable to support diving into deeper details of each asset.

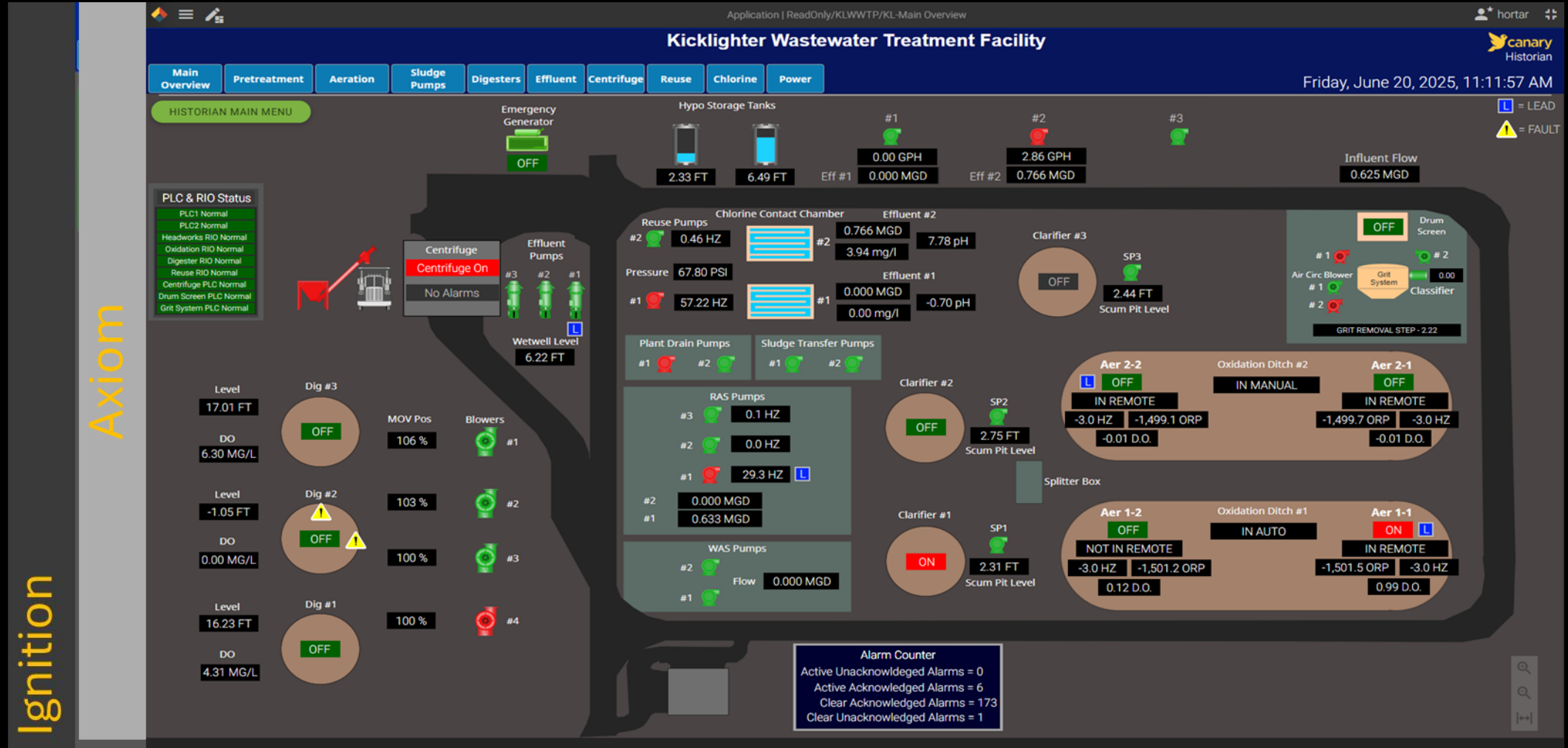


Price Creek Water Production Dashboard

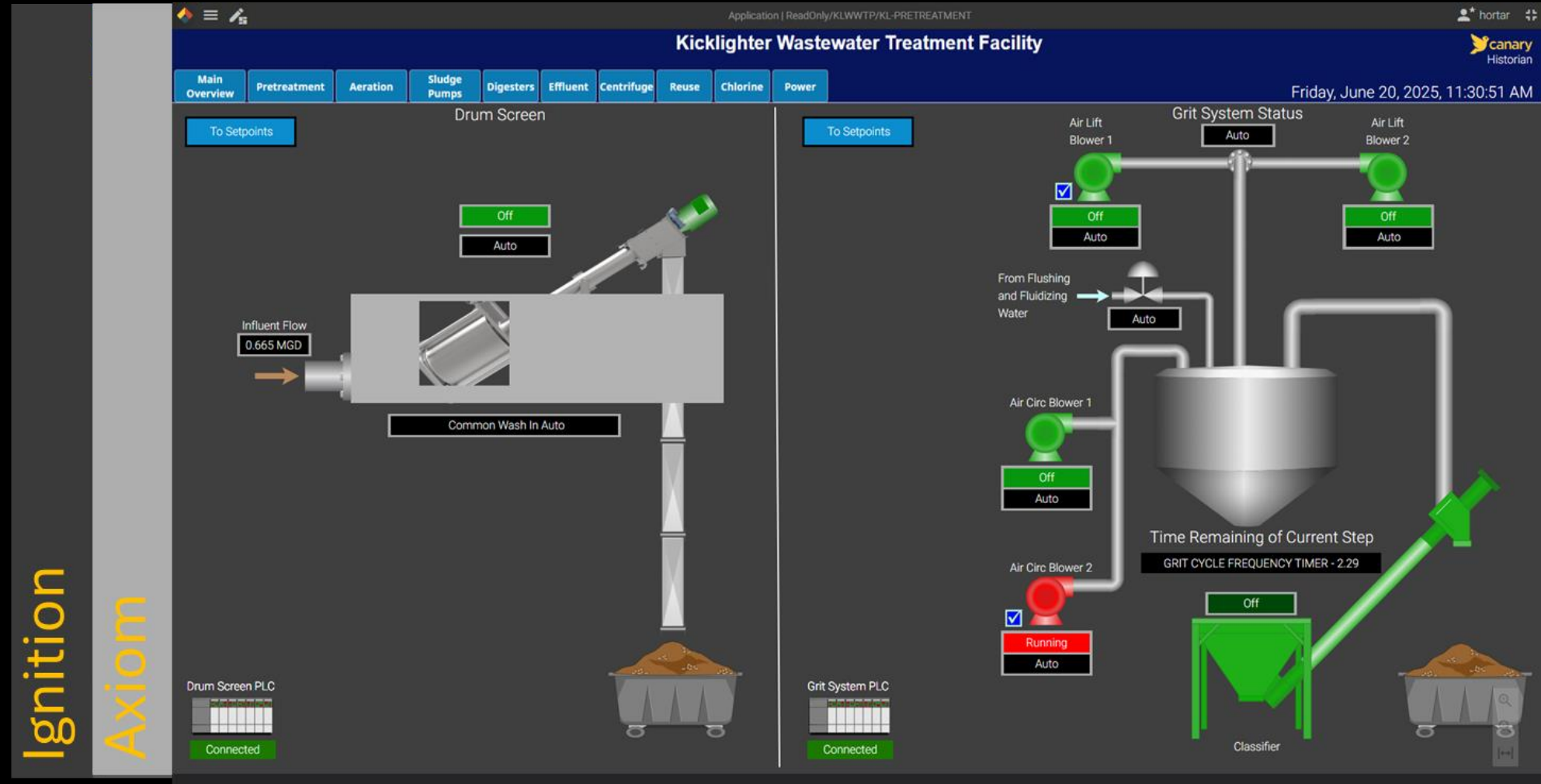
Dashboards have been configured to provide quick insights into the operating status and conditions of the overall facility.



Kicklighter Wastewater Plant Overview



Kicklighter Wastewater Pretreatment – Drill Down



Lift Stations – Previous Day Run Status Dashboard

For Lift Stations, we provided daily runtime hours, pump starts and faults for each of the lift stations. The lift station operators view the screens in the morning to identify previous day issues with the lift stations.

Application | ReadOnly/LIFTSTATIONS/LS Runtimes & Starts

LS00 - LS76 LS77 - LS145 LS150 - LS175 LS180 - LS192

MAIN MENU LS OVERVIEW LS RUNTIMES LS GENERATORS KL FORCE MAIN SMS FORCE MAIN NORTH MAP SOUTH MAP EAST MAP WEST MAP

City of Lake City
Lift Station Previous Day Runtimes and Starts
Saturday, June 21, 2025, 12:00:00 AM

Lift Station	Station No.	Pump 1 Runtime/Hrs	Pump 2 Runtime / Hrs	Pump 1 Starts	Pump 2 Starts	Alarm Light
LS 00 - City Barn	12	2.62	2.50	39	38	0
LS 05 - 100A & 441	13	2.90	2.38	92	89	0
LS 10 - Richardson Street	14	0.58	0.00	10	0	0
LS 15 - Gibbs Street	15	1.83	1.97	41	41	0
LS 16 - Airport	17	0.34	0.31	3	3	0
LS 20 - Florida Gateway College	18	2.17	2.69	34	34	0
LS 25 - Industrial Park	19	0.31	0.59	7	7	0
LS 30 - Baya Avenue	30	1.26	1.38	40	40	0
LS 35 - VA Domiciliary	31	0.56	0.56	6	6	0
LS 40 - Cherry Street	32	0.59	0.61	8	9	0
LS 41 - Lake Drive	16	0.56	0.60	19	17	0
LS 45 - Council on Aging	33	2.98	2.68	30	29	0
LS 46 - Loquat Bridge	34	0.23	0.28	5	5	0
LS 50 - Valencia Road	35	0.92	1.29	13	13	0
LS 55 - Inglewood	36	1.24	0.51	4	4	0
LS 60 - High School	37	0.14	0.16	6	6	0
LS 65 - Mental Health	38	N/A	0.38	N/A	10	0
LS 70 - Crews	39	0.42	0.55	3	4	1
LS 75 - 47 South	40	0.24	0.27	12	13	1
LS 76 - Ring Court	84	0.00	0.00	0	0	0

Master Radio Information
FRN Number - 0001804053
Call Sign - WRVM445
Transmit Frequency - 217.425
Expiration Date - 12/09/2032
Receive Frequency - 218.825
License Renewals handled by Darflow System
NOTE: Lift Stations have their own Exp. Dates

Repeater at Elevated Storage
FRN Number - 0001804053
Call Sign - WRVM445
Transmit Frequency - 217.425
Expiration Date - 12/09/2032
Call Sign - WRVU807
Receive Frequency - 218.825
Expiration Date - 01/09/2033
License Renewals handled by Darflow System

Click on Error to see Exact Time of Alarm

Speed/Sec 00:03:00 Start 06/21/2025 12:00:00 AM Duration 1:00:00:00 Position 06/21/2025 12:00:00 AM

Lift Station - Hurricane Helene Sept. 26

Lift stations were overwhelmed during the Hurricane Helene on September 26, 2024. This recording of the Axiom playback feature shows the impact of the storm over time.

“User especially love the Axioms playback feature. It allows them to see how situations have developed over time.”

The screenshot displays the 'City of Lake City Lift Station Overview' dashboard. The interface features a grid of lift stations, each with a name and a status icon (green for active, red for inactive). The dashboard is titled 'City of Lake City Lift Station Overview' and includes a date and time stamp: 'Thursday, September 26, 2024, 09:00:00 PM'. A 'Total Number of TCUs = 78' is displayed at the bottom right. The playback control bar at the bottom shows 'Start playback', 'Speed/Sec 00:10:00', 'Start 09/26/2024 10:00:00 PM', 'Duration 1:00:00:00', and 'Position 09/26/2024 10:00:00 PM'.

Lift Station	Status
LS00 - City Barn	Active
LS05 - 100A & 441	Active
LS10 - Richardson St.	Active
LS15 - Gibbs Street	Active
LS16 - Airport	Active
LS20 - FI Gateway Clge	Active
LS25 - Industrial Park	Active
LS30 - Baya Avenue	Active
LS35 - VA Domiciliary	Active
LS40 - Cherry Street	Active
LS41 - Lake Drive	Active
LS45 - Council on Aging	Active
LS46 - Loquat Bridge	Active
LS50 - Valencia Road	Active
LS55 - Inglewood Ave	Active
LS60 - High School	Active
LS65 - Mental Health	Active
LS70 - Crews	Active
LS75 - 47 South	Active
LS76 - Ring Court	Active
LS77 - WindSwept	Active
LS80 - Brown Lane	Active
LS85 - Phish Tales	Active
LS90 - Cardinal	Active
LS95 - Pool	Active
LS100 - Grouse	Active
LS105 - Piney Woods	Active
LS110 - Ironwood Dr.	Active
LS115 - Judy Street	Active
LS117 - SITEL	Active
LS120 - Bowling Alley	Active
LS121 - Fairgrounds	Active
LS122 - Windsong	Active
LS123 - Quail Heights	Active
LS125 - Gleasons	Active
LS130 - Gleason Mall	Active
LS135 - Espenship	Active
LS140 - McDonalds	Active
LS141 - Medical Center	Active
LS145 - Country Club #1	Active
LS150 - Country Club #2	Active
LS151 - Motel 6	Active
LS152 - Jiffy Junction	Active
LS153 - Holiday Inn	Active
LS154 - Plantation	Active
LS155 - Econolodge	Active
LS156 - Hall of Fame	Active
LS157 - Laurel Lakes	Active
LS158 - Deer Creek	Active
LS159 - Stone Gate	Active
LS160 - Burger King	Active
LS161 - Jerry's Rest.	INACTIVE
LS162 - Preserves at LL	Active
LS163 - Jewel Lakes	Active
LS164 - Orthopedic Inst.	Active
LS165 - Lake Harper	Active
LS166 - Jewel Lake 2	Active
LS170 - Animal Shelter	Active
LS171 - New Millineum	Active
LS175 - Wilson Street	Active
LS180 - Georgia Street	Active
LS185 - County Jail	Active
LS190 - I10 & 441	Active
LS191 - Target	Active
LS192 - Werner	Active

Axiom Mobile Screens – Plant Overview Screens

- Axiom is developed with HTML5.
- Dashboards can be shared with any device that support a browser.
- Displays are configured for mobile users.
- Provide visibility of operations for users on the go.
- Great for technicians working in the field.

Price Creek WTP



Kicklighter WWTP

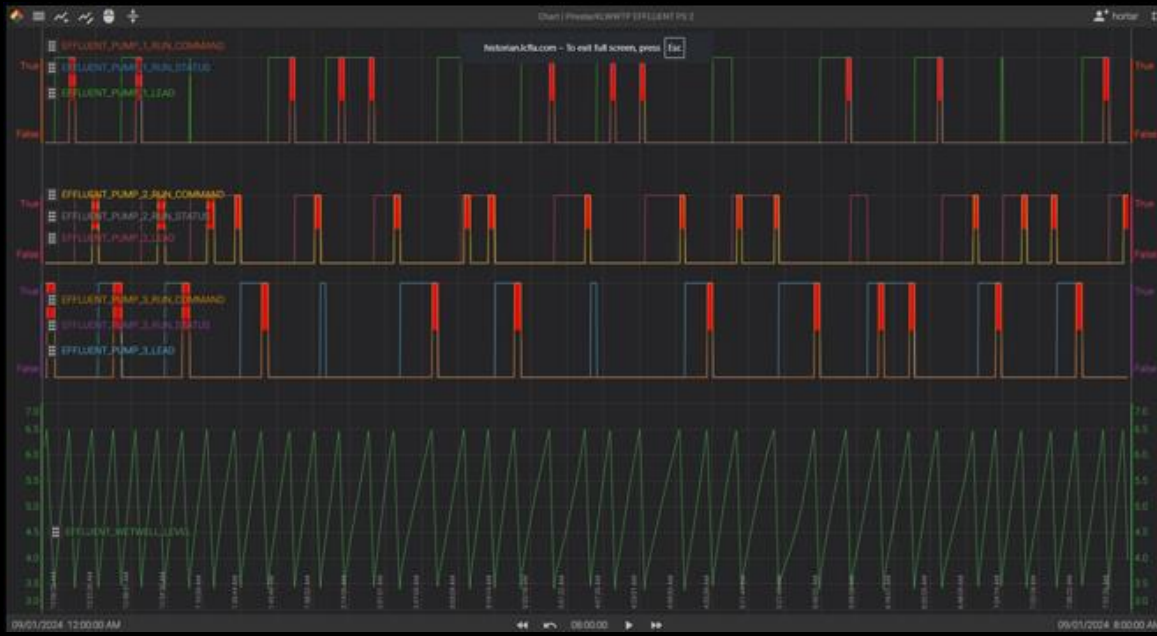


Canary Simplifies Problem Solving

The Canary System provides both real-time and historical operational insights. Powerful trending capabilities, dashboarding and graphical displays provide users with situational awareness.

Troubleshooting Examples

Pump Alternations



Network Monitoring



Network Outage Calculation

- Canary Calcs & Events make it easy to configure alerts that are triggered with a set of conditions are met.
- Problems come to you versus you finding them.
- Email notifications can be assigned to events to notify a group of users of abnormal conditions.

Name PCWTP WatchDog

Asset Path

Asset Type

Meta

Backfill To 1/1/2022 12:00 AM **Data Range:** 4/8/2022 7/7/2025 ☐ Remove Old Data

Frequency ☐ Value Change ☒ Periodic

Interval 2m **Offset** 10s

Enable Time Extensions ☒

Delay 1s

EVALUATE Details: Visible

✓ **Minutes** = 0.003333333333333333

Minutes = `DurationSinceLastTVQ(["localhost.PCWTP.HMI_CLOCK_SECONDS"])/1000/60`

Quality Override Condition: ☐ If true: ☐ If false: ☐

Quality: Good(0xC0) Timestamp: 2025-07-07 15:36:10 Time: 4 ms

Tag: **Type:** ServerDefault **TS:**

Meta: Description::Returns the time (milliseconds) since tag's value or quality has changed;;

Event: Not Set

✓ **↑** = False -> CalcDataSet.PCWTP_WATCHDOG

☐ = Minutes > 1

Quality Override Condition: ☐ If true: ☐ If false: ☐

Quality: Good(0xC0) Timestamp: 2025-07-07 15:36:10 Time: <1 ms

Tag: CalcDataSet.PCWTP_WATCHDOG **Type:** ServerDefault **TS:**

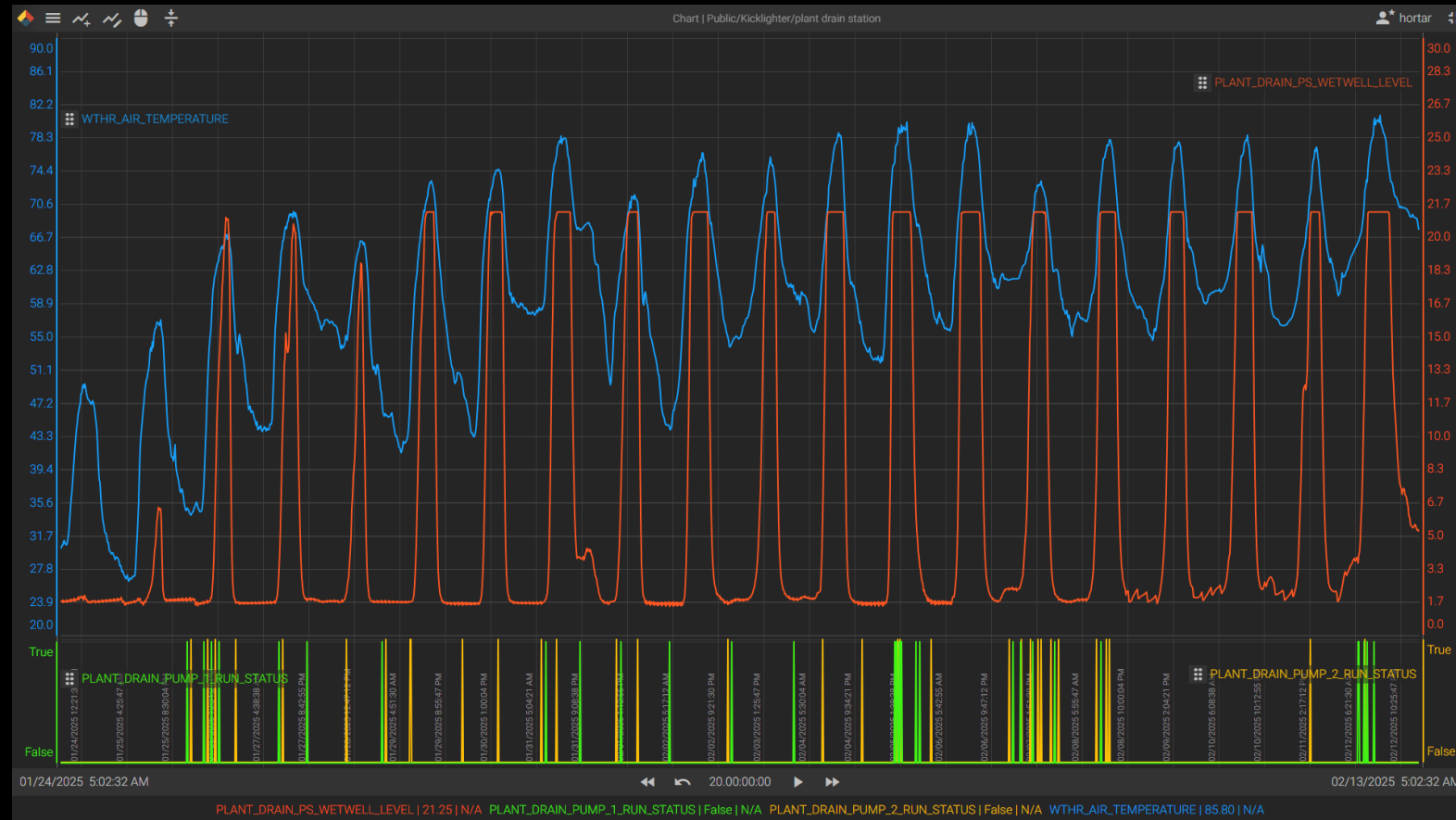
Meta:

Event: Is Event Start Trigger **Min Duration:** 10s **Notify Email:** gis@lcfla.com; crossmane@lcfla.com; osbornm@lcfla.com



Wet well Level Affected by Air Temperature

With Trends we were able to identify a correlation of well levels to ambient air temperatures that we collect from our weather station.



Recommendations



- Collect as much data as possible from your system to help you identify abnormal conditions and avoid long and unnecessary interruptions.
- Collaborate with End Users to develop screens that provide them with information to optimize operations.
- Create initial displays and keep navigation simple to help users get comfortable using Axiom.
- Don't underestimate the power of the Playback function.
- Take advantage of Calcs & Events to automate excursion and abnormal condition detection.
- Enhance displays and reports as new insights are gained.

Thank You



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