OCTOBER 24, 2023

Beyond Boundaries: AVEVA's Convergence of Edge and Cloud for Reshaping Wastewater Management

Presented By: Eric Conder

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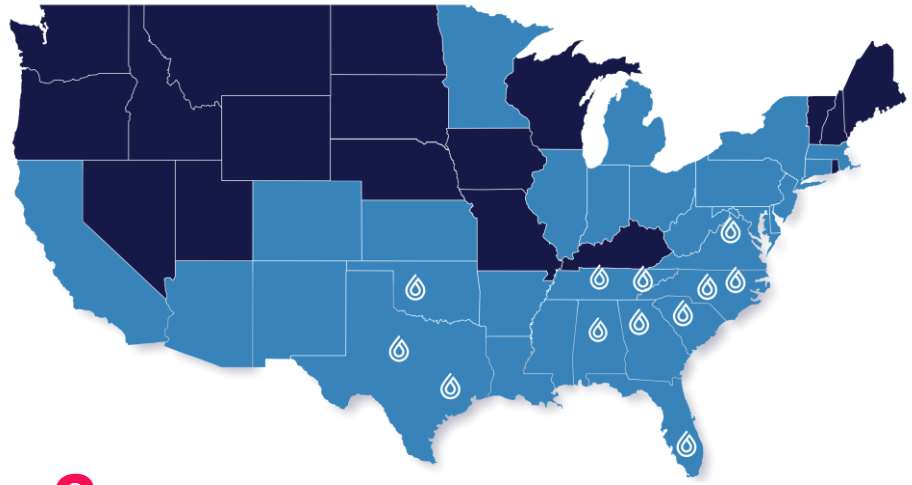
Who is Inframark?



180+
Employees

33+
Years of Service Excellence

1,500+
Clients Served

1,200
Treatment Projects Completed

9
Office Locations

CISSP
Certified Cybersecurity Services

1 MILLION
Data Points Managed on Cloud Hosted SCADA

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Who is Inframark?

INFRAMARK
WATER & INFRASTRUCTURE SERVICES

- **3,000 dedicated employees** across North America in **25 states**
- **400+** business and municipal clients
- Manages **287 water** and **279 wastewater** facilities
- Manages more than **2,000 lift stations**
- Combined capability of treating more than **1 billion gallons** daily
- **99.9%** regulatory compliance
- **99+%** partnership renewal rate company-wide

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AVEVA

WATER AND WASTEWATER | UNITED STATES

INFRAMARK
AUTOMATION & INTELLIGENCE

Inframark A&I Connects Data Silos and Teams Across the Enterprise

Challenge

- Use machine learning to discover and explore new insights from existing data.
- Leverage disparate data sources across the enterprise to gain insights into operational efficiencies.
- Find a software stack that will enable any team in the enterprise to access and view the data.

Solution

- Utilize AVEVA Edge, Edge Management, and Data Hub to aggregate the data into an accessible repository. Then, use AVEVA Data Hub, Connect Visualization Services, and Advanced Analytics to discover the operational efficiencies and gain valuable insights.

Results

- **Developed a unified namespace to use when aggregating plant data into Data Hub**
- **Combined lab data, SCADA historian data, and real-time data into AVEVA Data Hub**
- **Created assets, visualizations, and AVEVA Advanced Analytics models that can easily be accessed by clients, enterprise users, and anyone else we need to share the information with.**
- **Built a few Advanced Analytics models that we'll continue to refine and operationalize.**

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Getting Started

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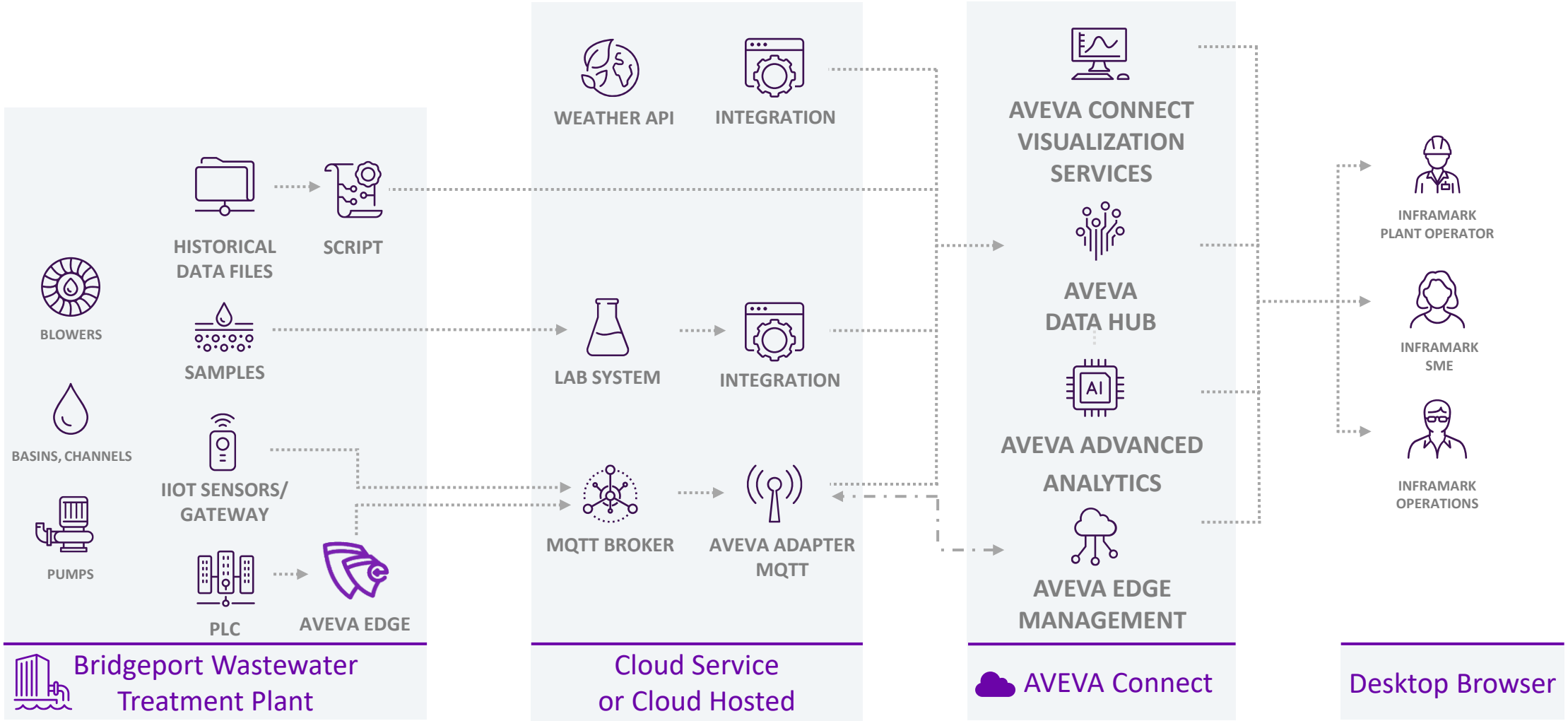
Lighthouse Architecture



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Collecting the Data

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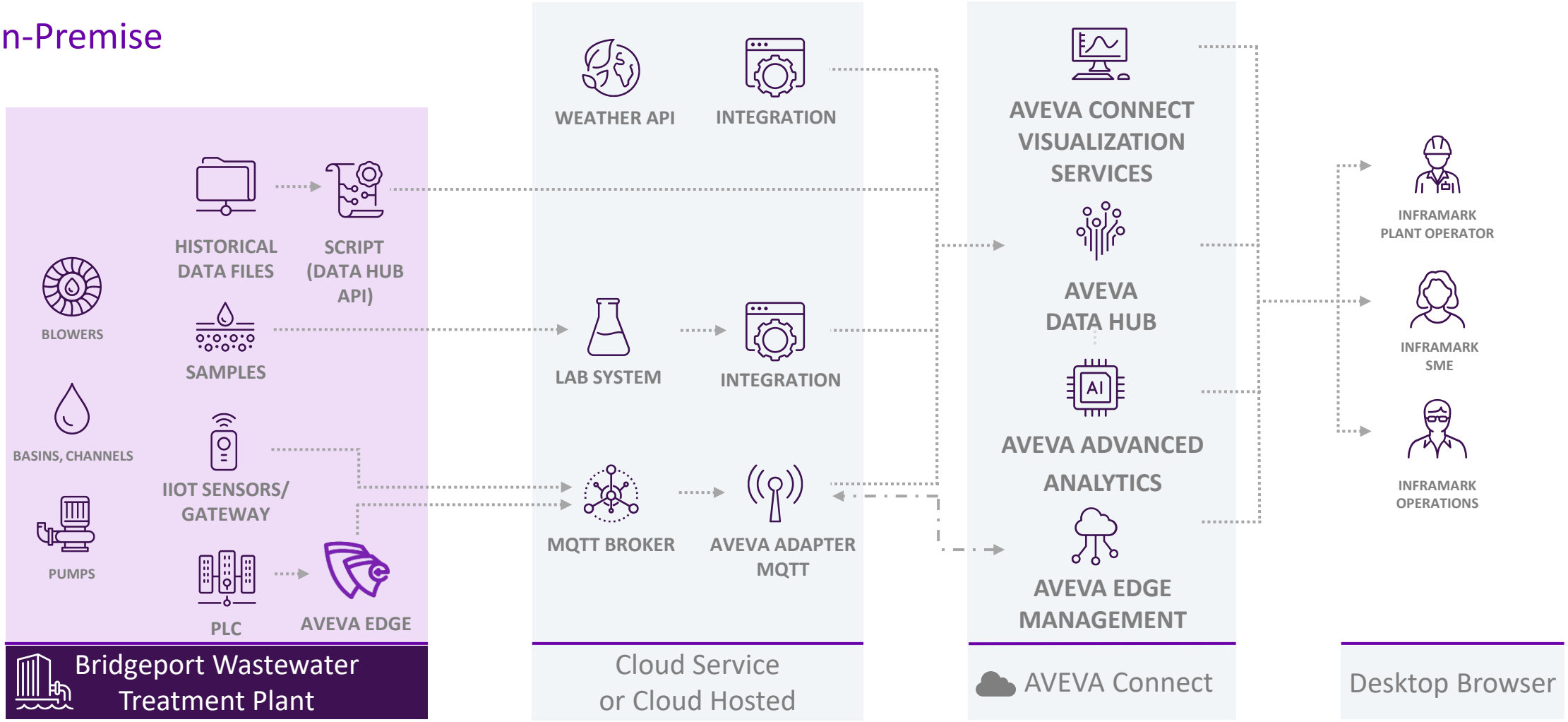
Lighthouse Architecture

On-Premise



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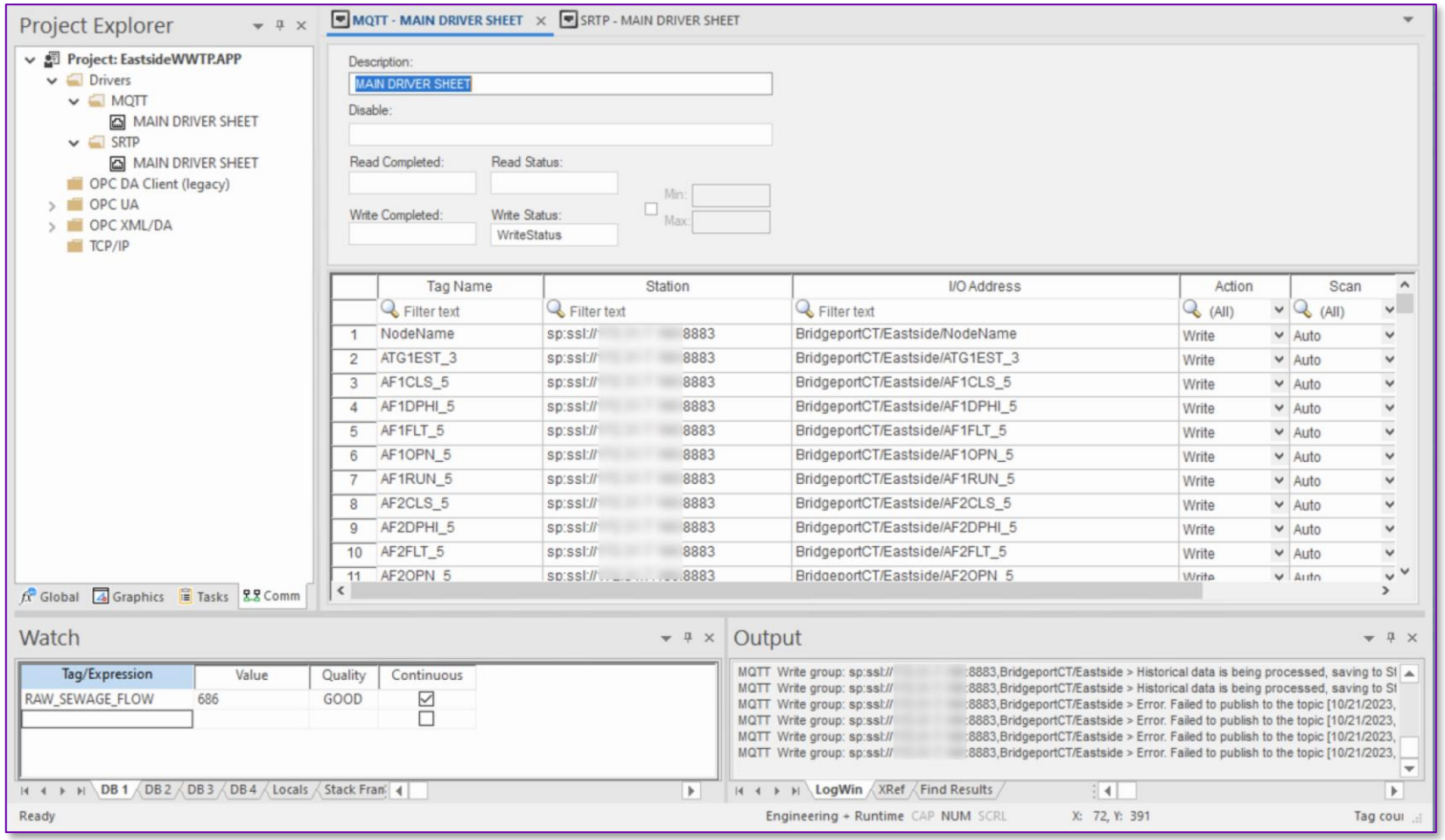
Edge Data Collection

AVEVA Edge On-Premise

- Communicates with plant PLCs
- Transmits data to cloud-based MQTT broker
- Can easily be setup for enterprise-wide deployment



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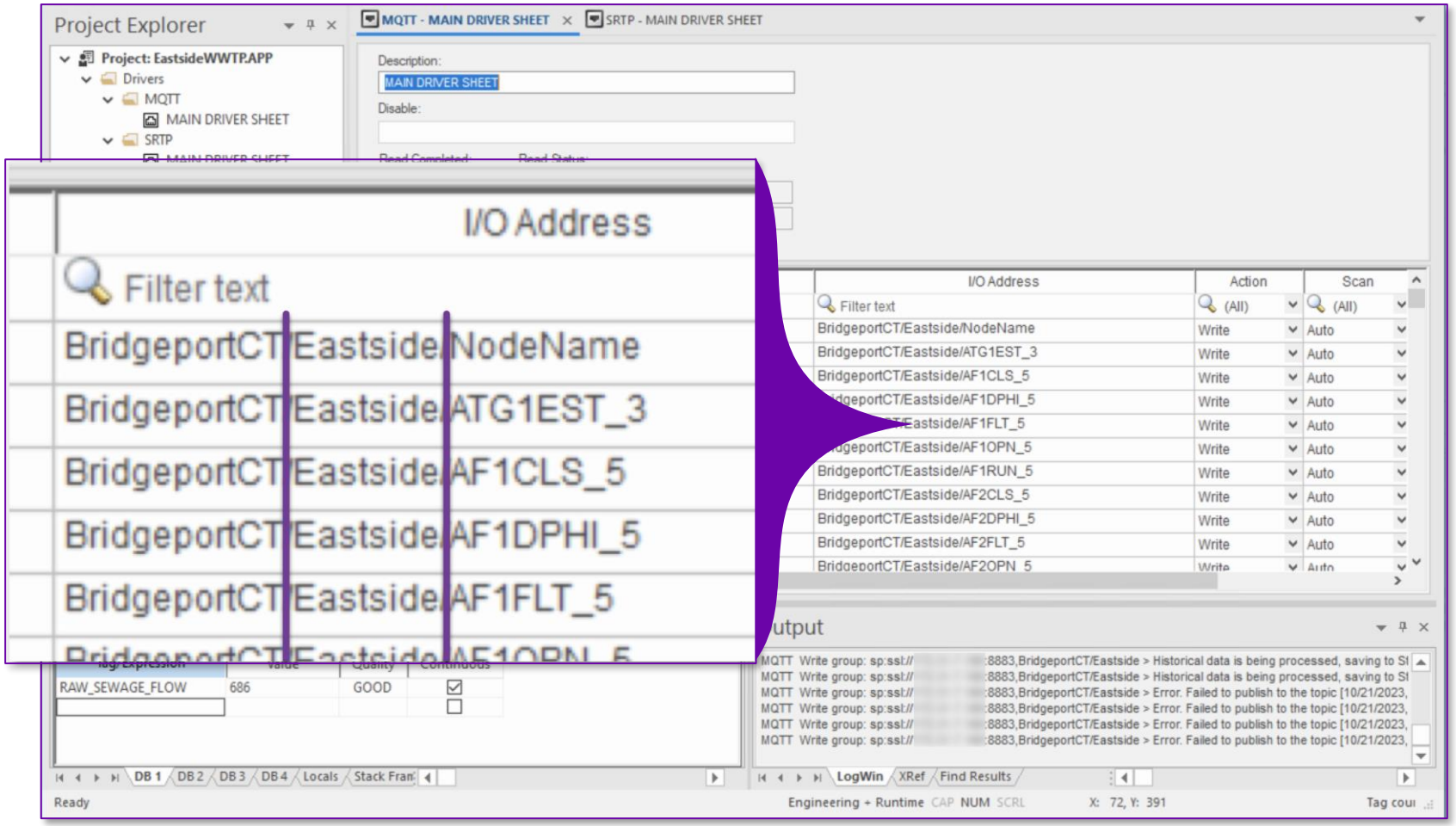
Edge Data Collection

Unified Namespace

- Efficiently organize data for multiple customers, facilities, process areas, etc.
- Aids in searching for data
- Allows for easy, secure data sharing later



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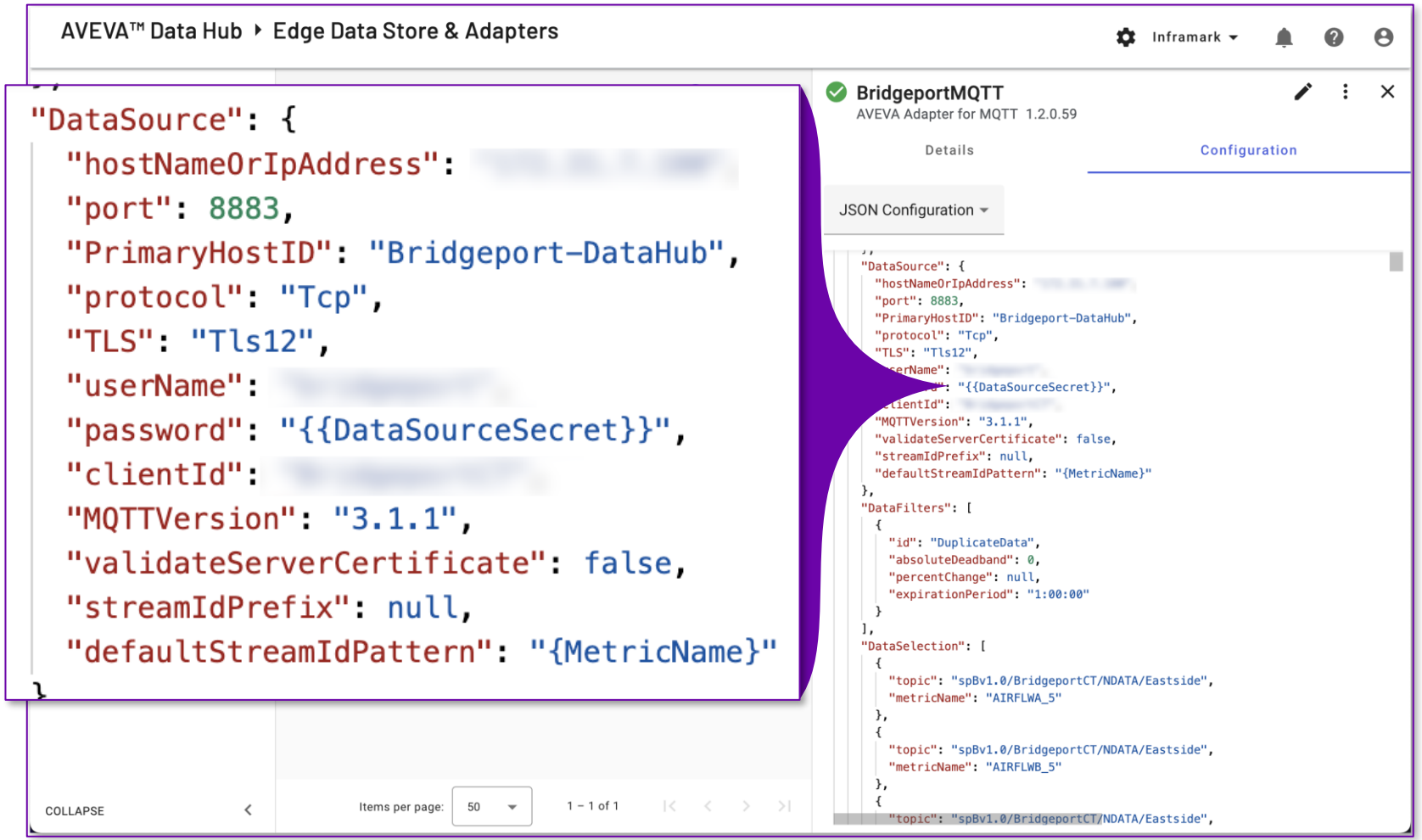
Edge Data Collection

Connecting AVEVA DataHub

- AVEVA Adapter for MQTT
- Connect to cloud-based MQTT broker
- Connect to AVEVA DataHub
- Map MQTT broker tags to AVEVA DataHub streams



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Edge Data Collection

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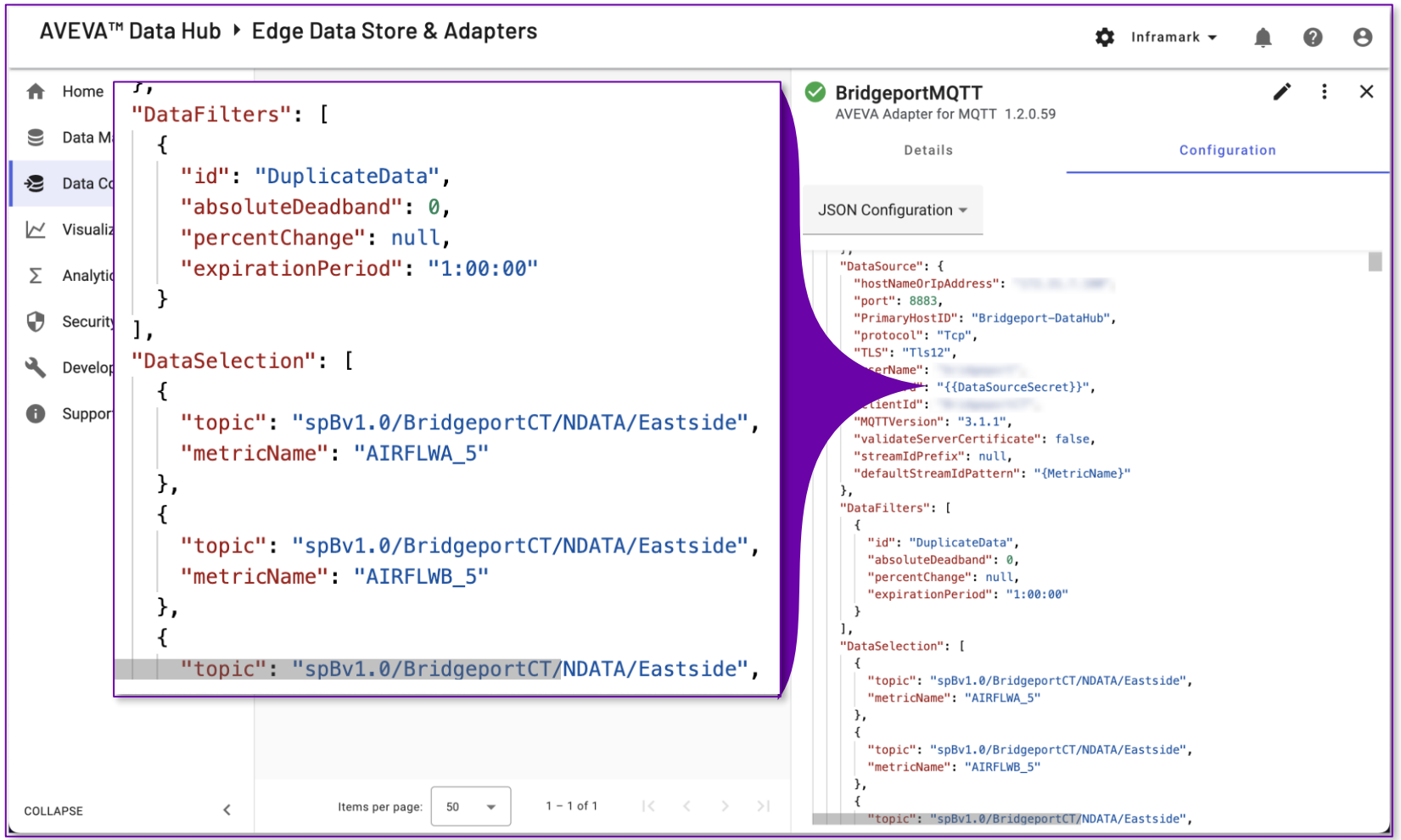

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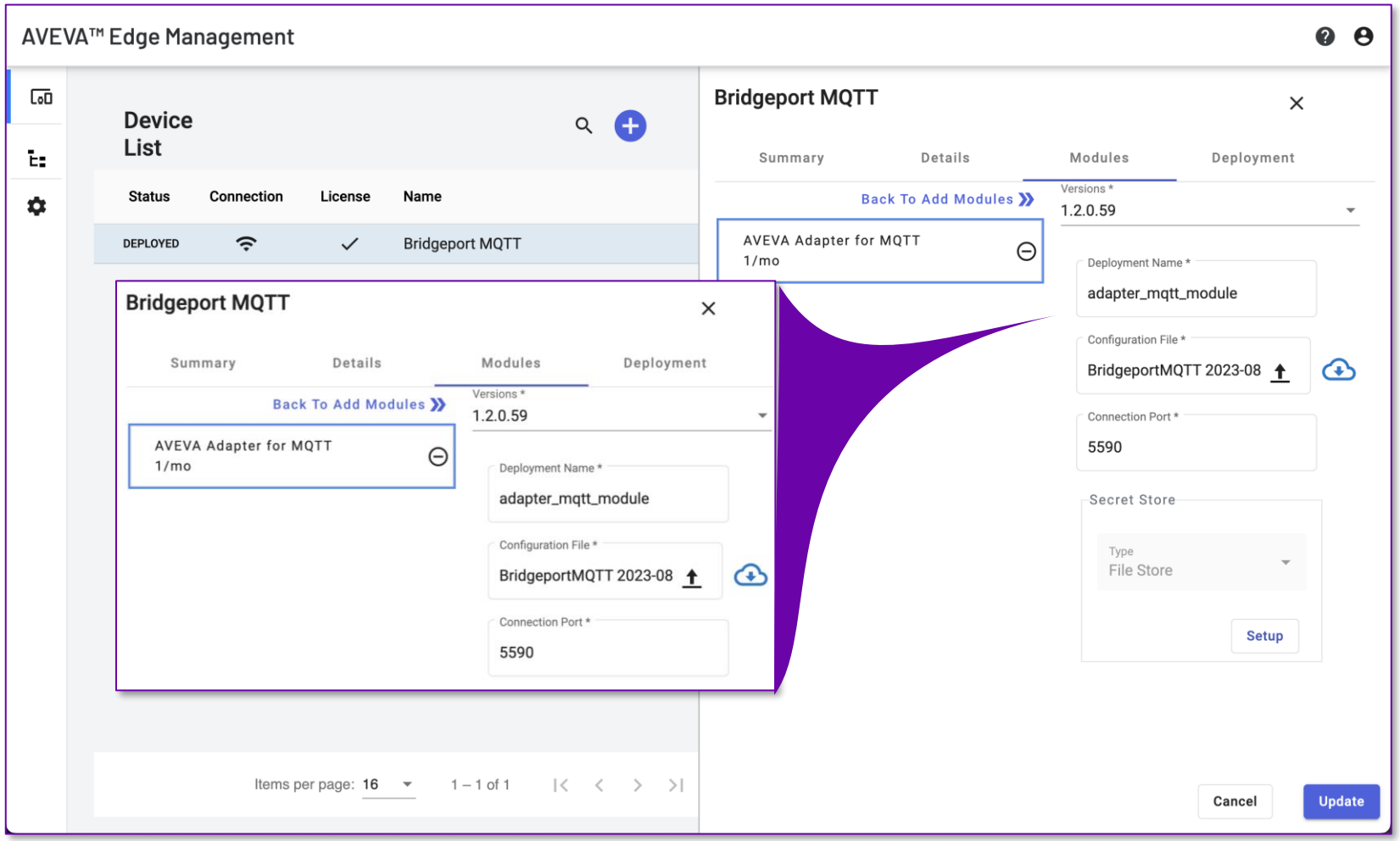
Edge Data Collection

Connecting AVEVA DataHub

- Deploy AVEVA DataHub device configuration
- Requirement to support variety of protocols
  - AVEVA Edge and AVEVA Adapter
- How to deal with software installation, updates and status



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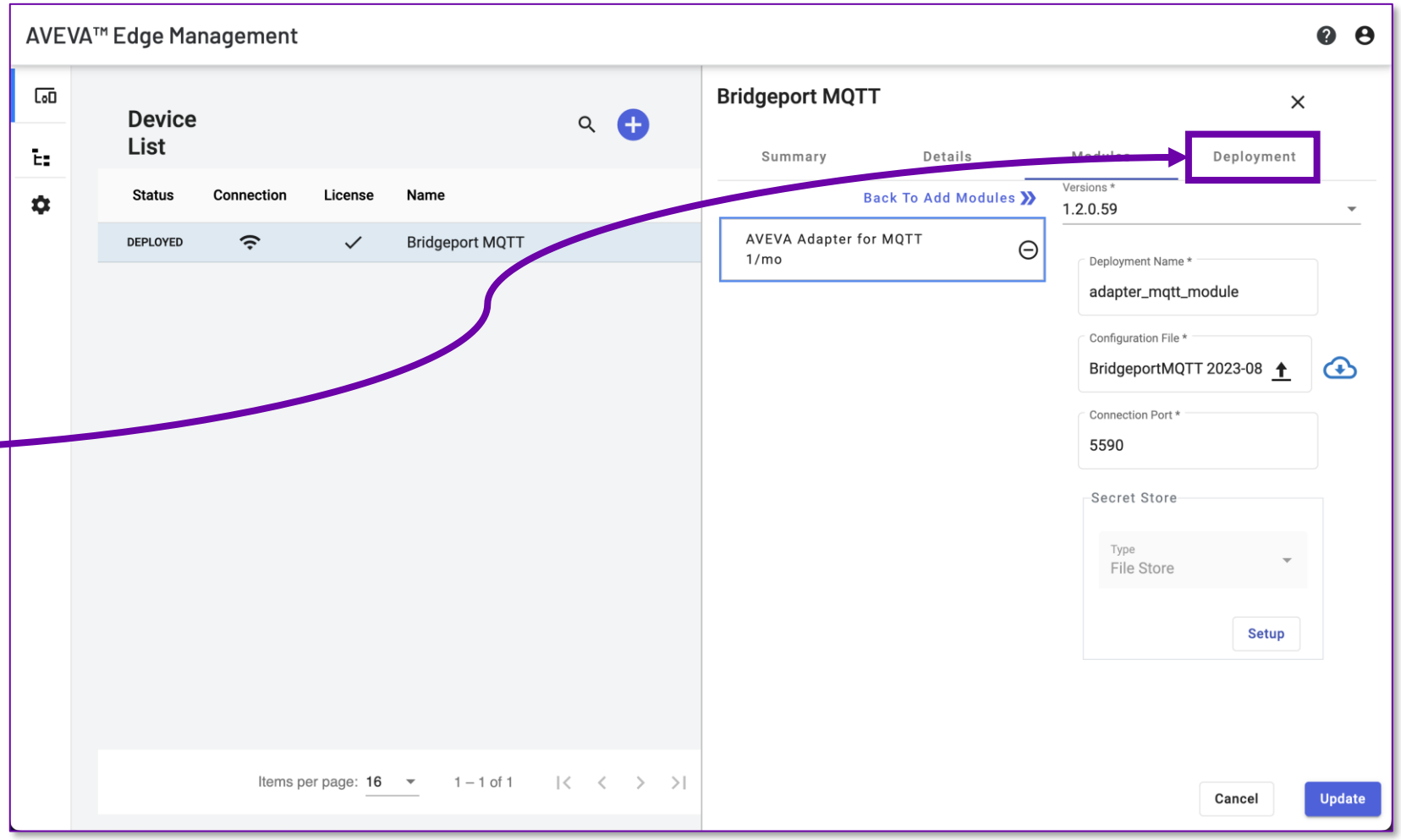
Edge Data Collection

Software Management

- Requirement to support variety of protocols
  - AVEVA Edge and AVEVA Adapter
- How to deal with software installation, configuration updates and status monitoring



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Aggregating the Data

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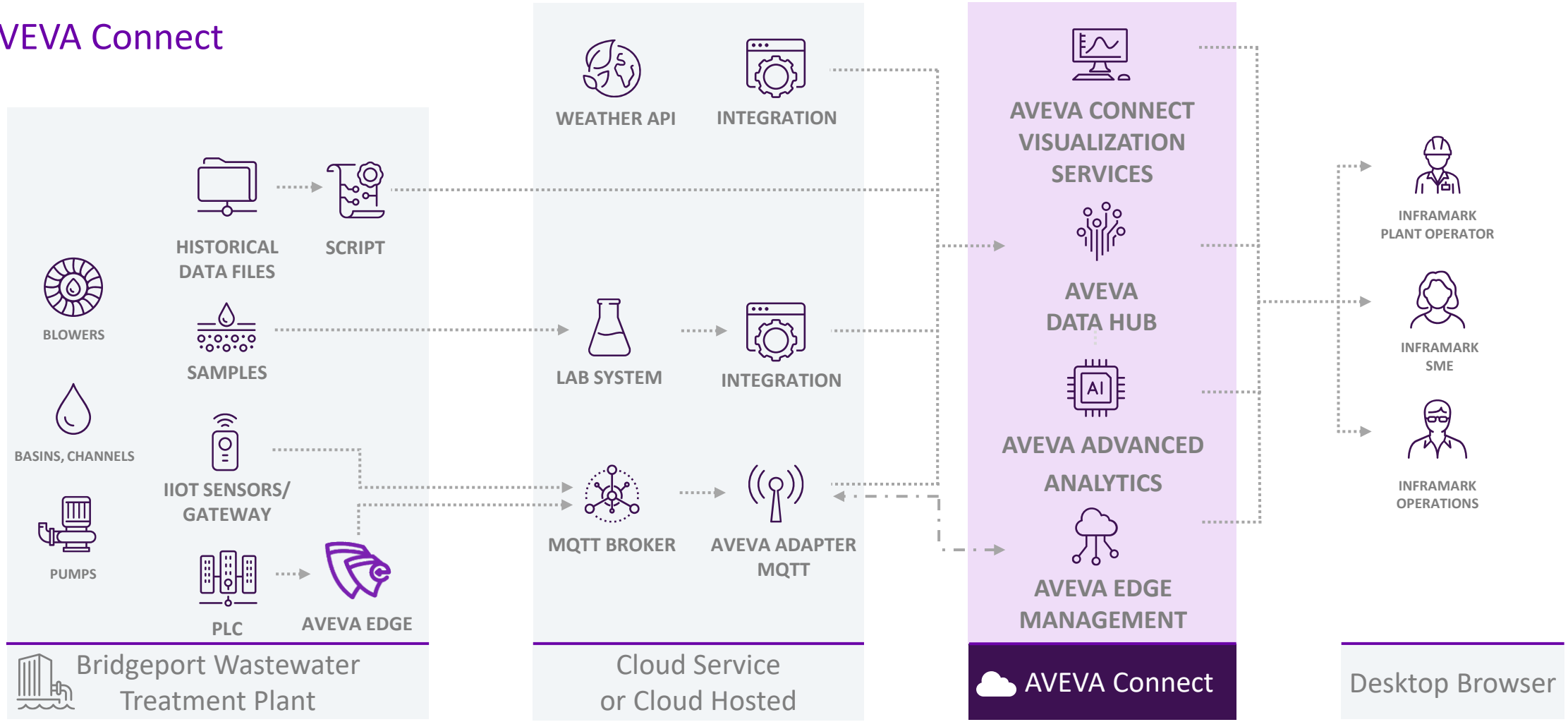
Lighthouse Architecture

AVEVA Connect



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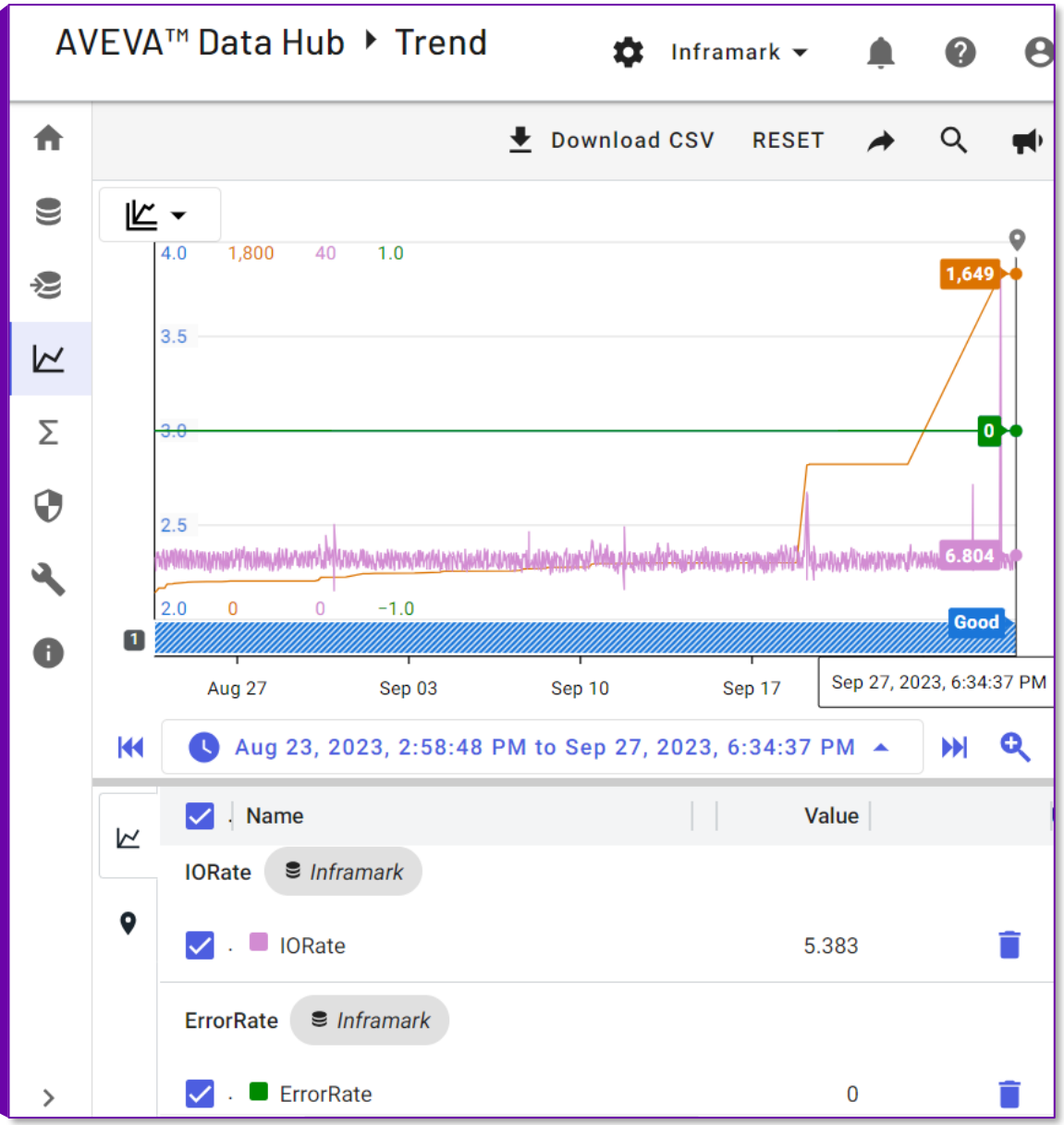
Edge Data Collection

Data Flow Management

- Keep the data flowing
  - Data Hub historizes metrics
  - Monitor health

BridgeportCT.Eastside

Health	**Good**
IO Rate	**7.15 event/s**
Error Rate	**0 event/s**
Type Count	**3**
Stream Count	**1,649**



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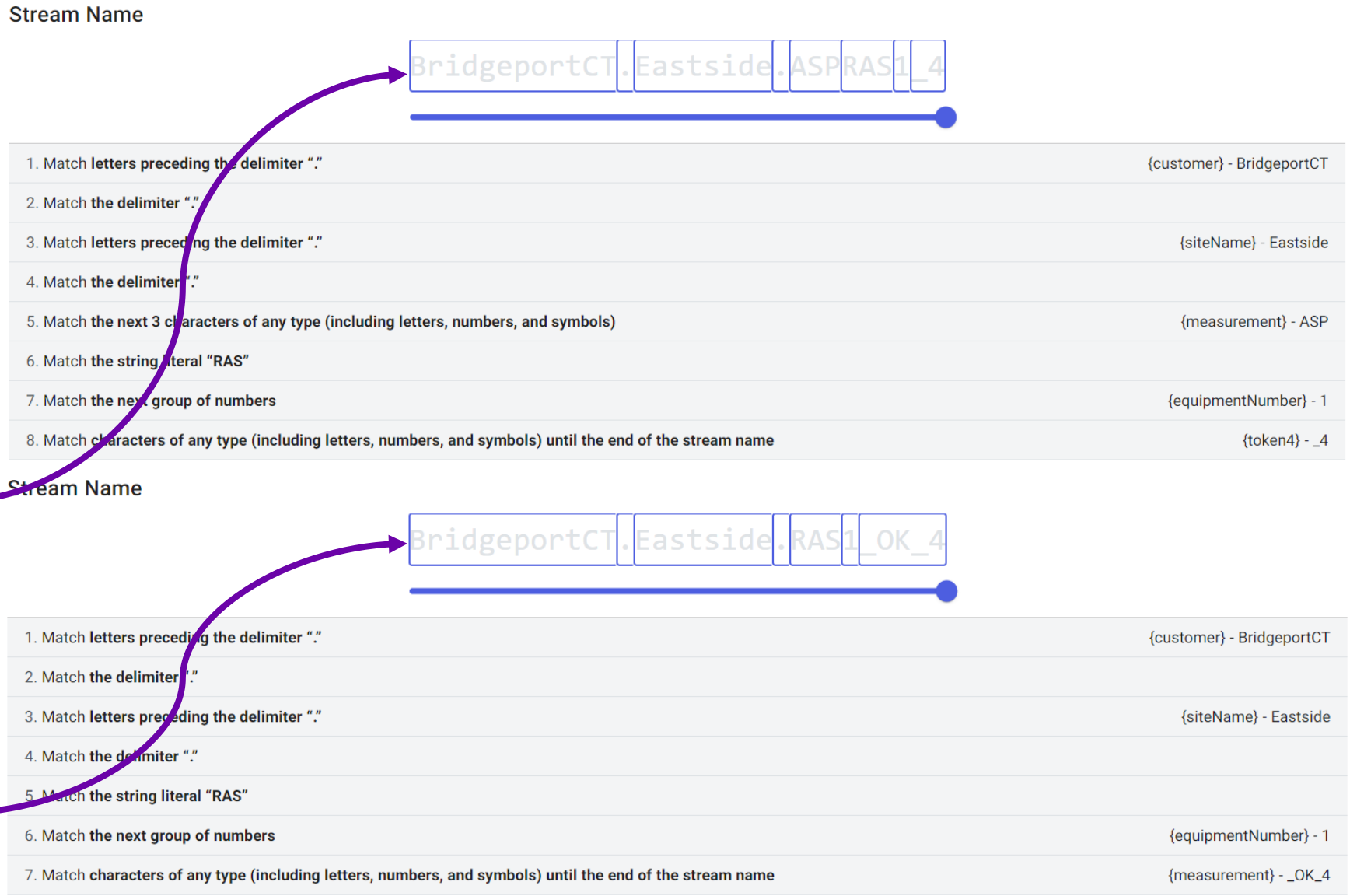
Data Management

Creating assets from Data Hub

- [ ] BridgeportCT.Eastside.ASPRAS2_4
- [ ] BridgeportCT.Eastside.ASPRAS3_4
- [ ] BridgeportCT.Eastside.ASPRAS4_4
- [ ] BridgeportCT.Eastside.ASPRAS5_4
- [ ] BridgeportCT.Eastside.ASPRAS6_4
- [ ] BridgeportCT.Eastside.NUMRASP_4
- [ ] BridgeportCT.Eastside.RAS1_OK_4



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Assets | Search for Assets | + Add Asset

RAS

Filter facets

processArea

- [x] RAS
- [ ] Plant Influent
- [ ] WAS
- [ ] AB#3
- [ ] AB#4
- [ ] AB#5
- [ ] AB#1
- [ ] Primary Clarifiers
- [ ] Primary Effluent
- [ ] Effluent

Clear All | Show More

siteName

dataSource

plcName

Asset
BridgeportCT.Eastside.RAS.Flows
BridgeportCT.Eastside.RAS.P1
BridgeportCT.Eastside.RAS.P2
BridgeportCT.Eastside.RAS.P3
BridgeportCT.Eastside.RAS.P4
BridgeportCT.Eastside.RAS.P5
BridgeportCT.Eastside.RAS.P6
BridgeportCT.Eastside.RAS.Pumps12
BridgeportCT.Eastside.RAS.Pumps34
BridgeportCT.Eastside.RAS.Pumps56

1 – 10 of 10

Items per page: 50

BridgeportCT.Eastside.RAS.P6

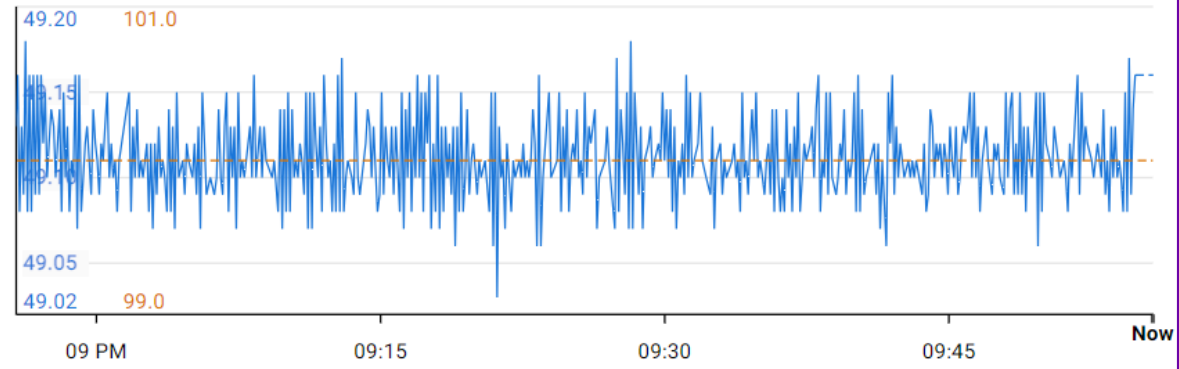
RAS Pump 6

Asset Type: <None>

Metadata | Properties | Status

Property	Last Value	UOM	Timestamp
Speed | Value	49.160		9/29/23, 9:54 PM
SSP_4 | Value	true		8/17/23, 12:10 PM
SST_4 | Value	true		8/17/23, 12:10 PM
Seal Water Fail | Value	false		8/17/23, 12:10 PM
Motor High Temperature | Value	false		8/17/23, 12:10 PM

Speed | Value | Manual Speed Setpoint | Value



Last 1 hour

Visualizing the Data

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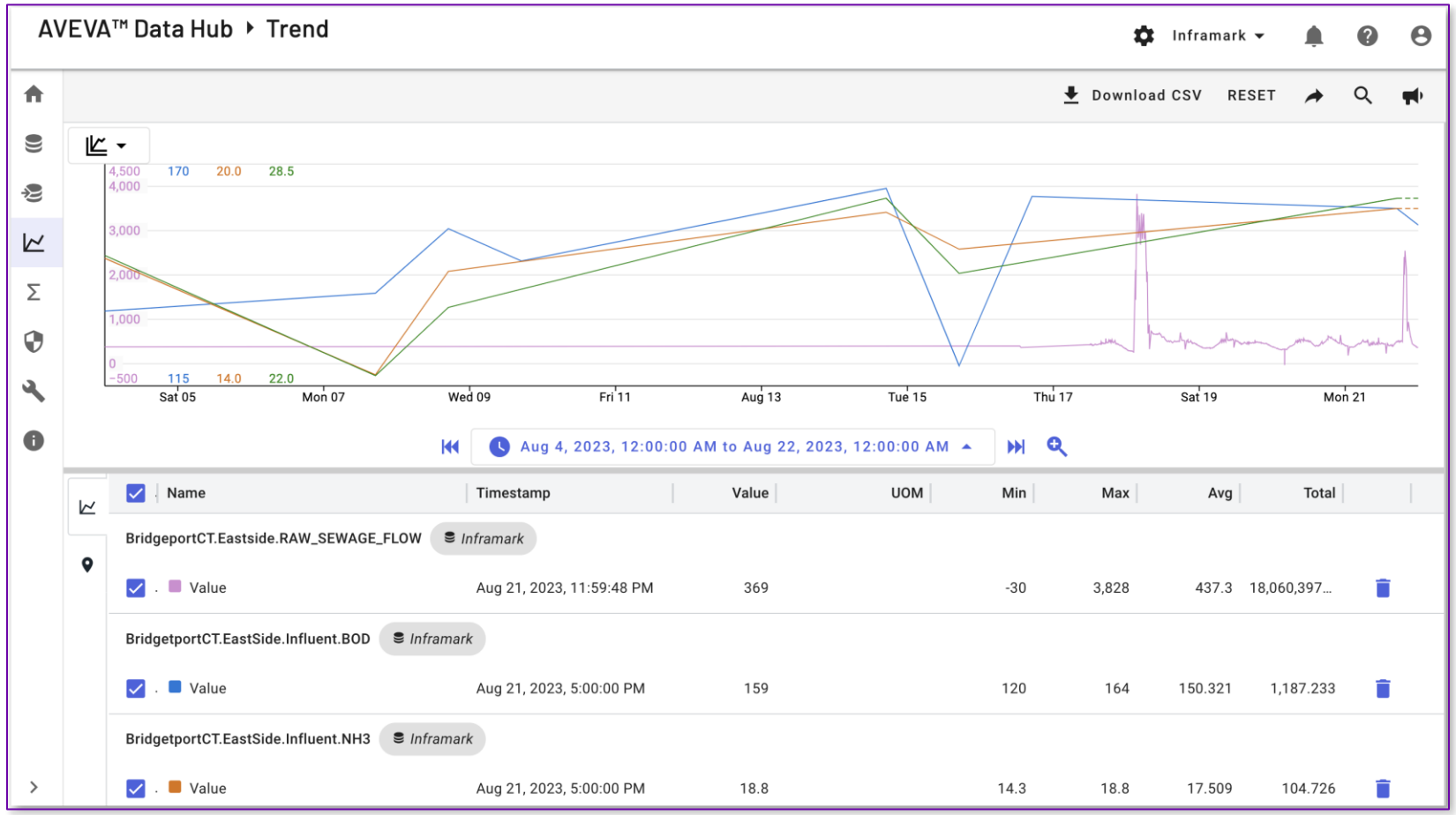
Understand the Dataset

Viewing Stream Data



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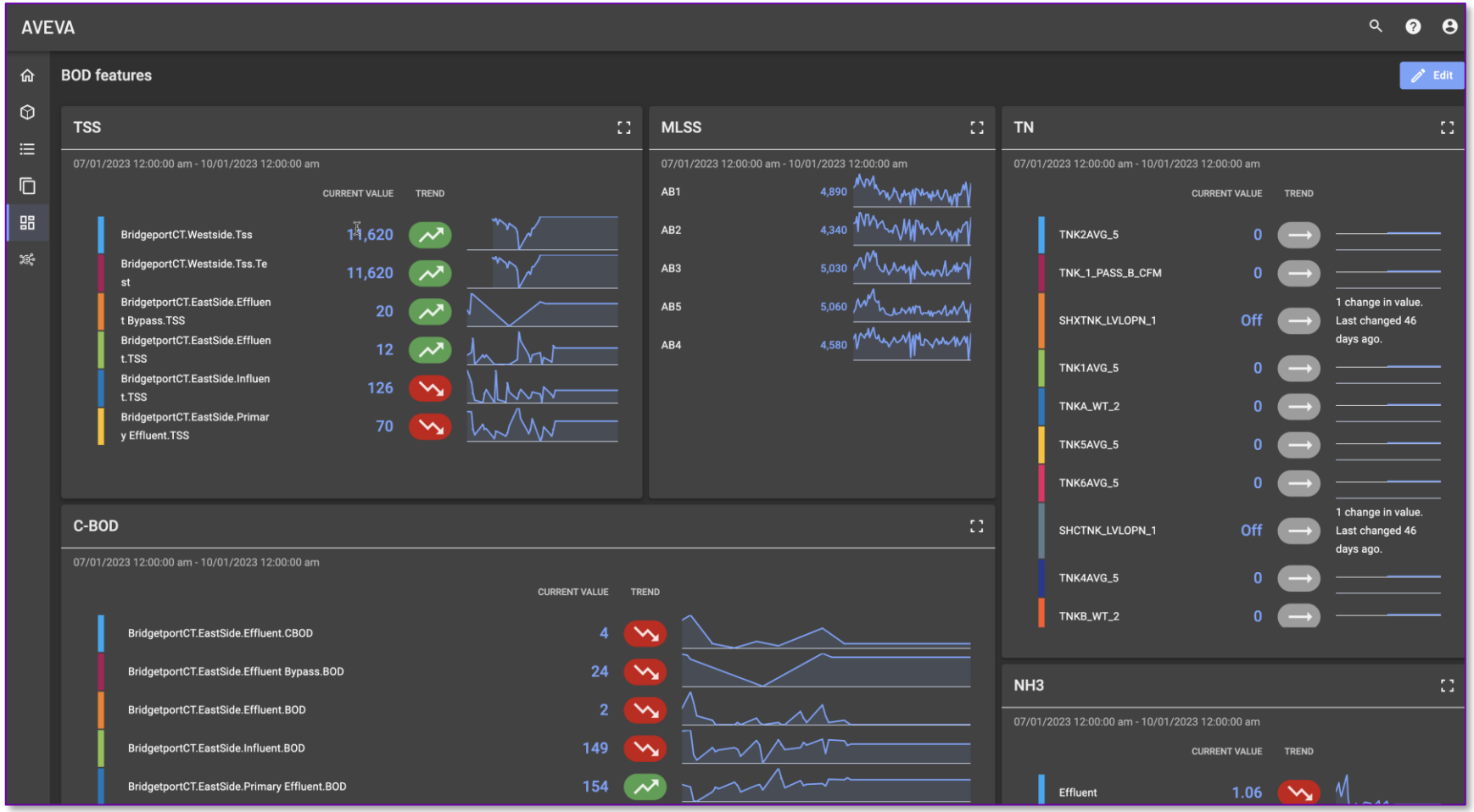
Assets, Content, & Dashboards

Visualization Content

- Create standalone visualization content
- Link content to Assets and Asset Types
- Create dashboards containing embedded and linked visualization content



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Predicting the Data

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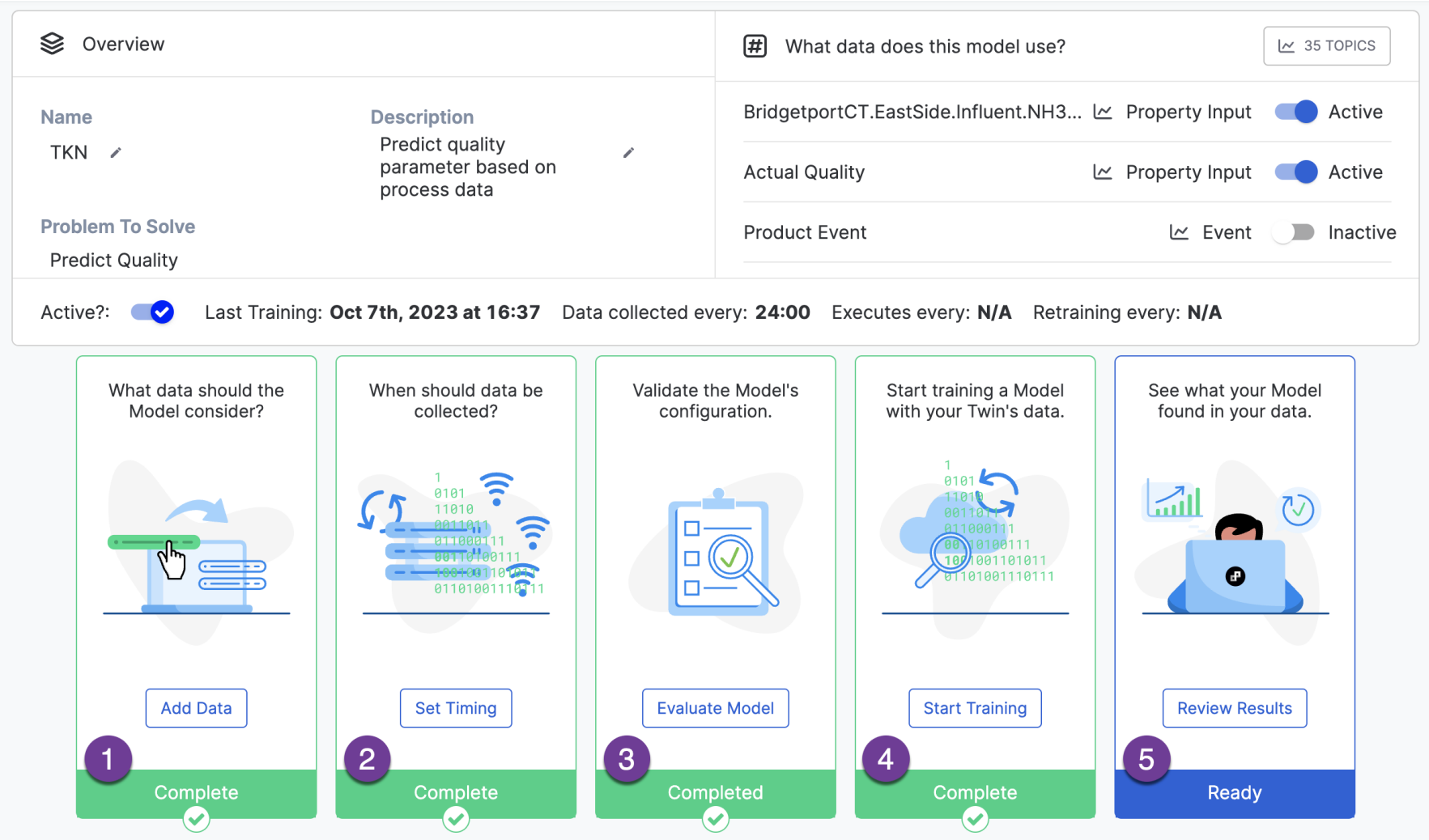
Ideal Model Conditions



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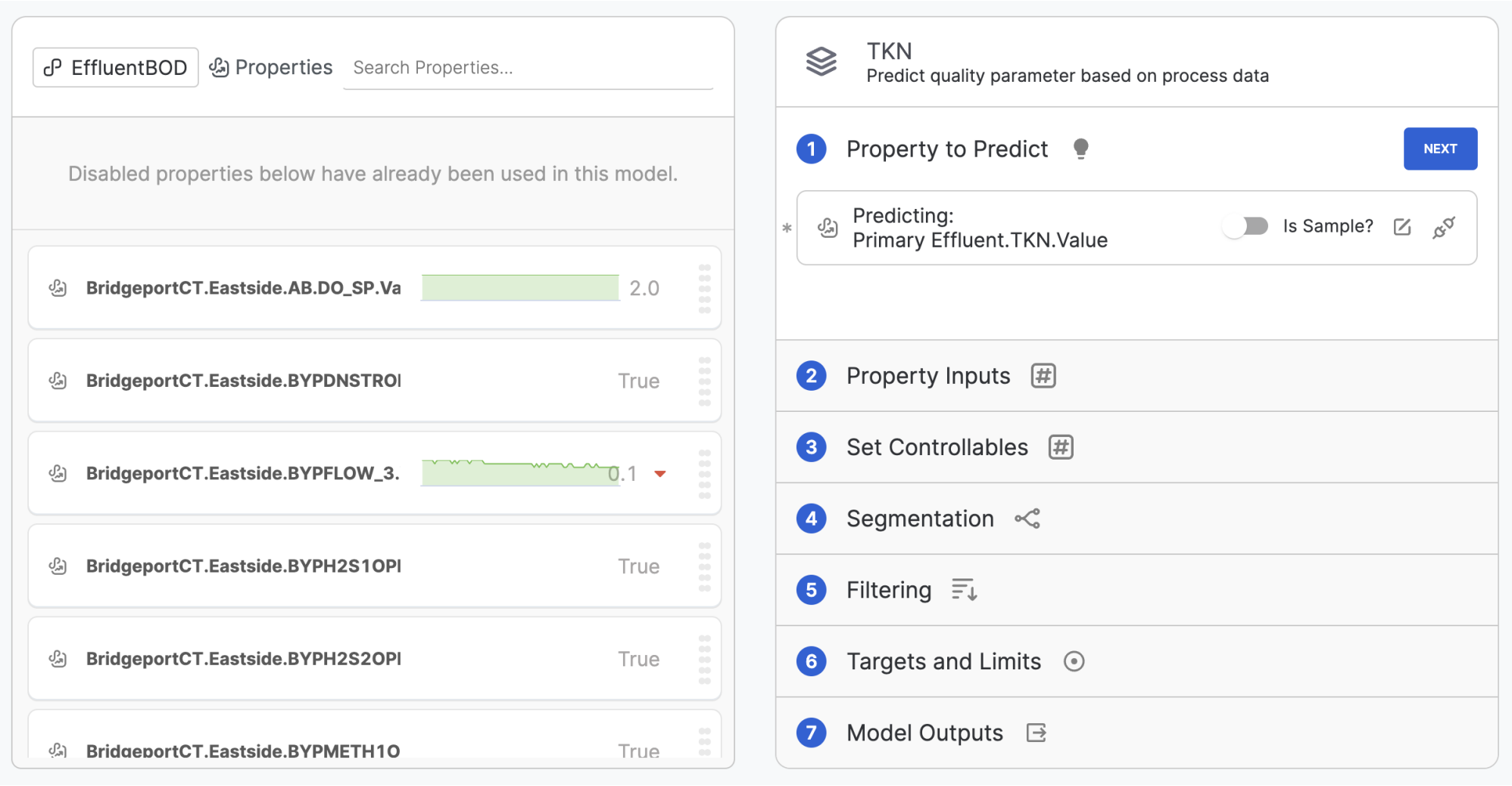
Ideal Model Conditions



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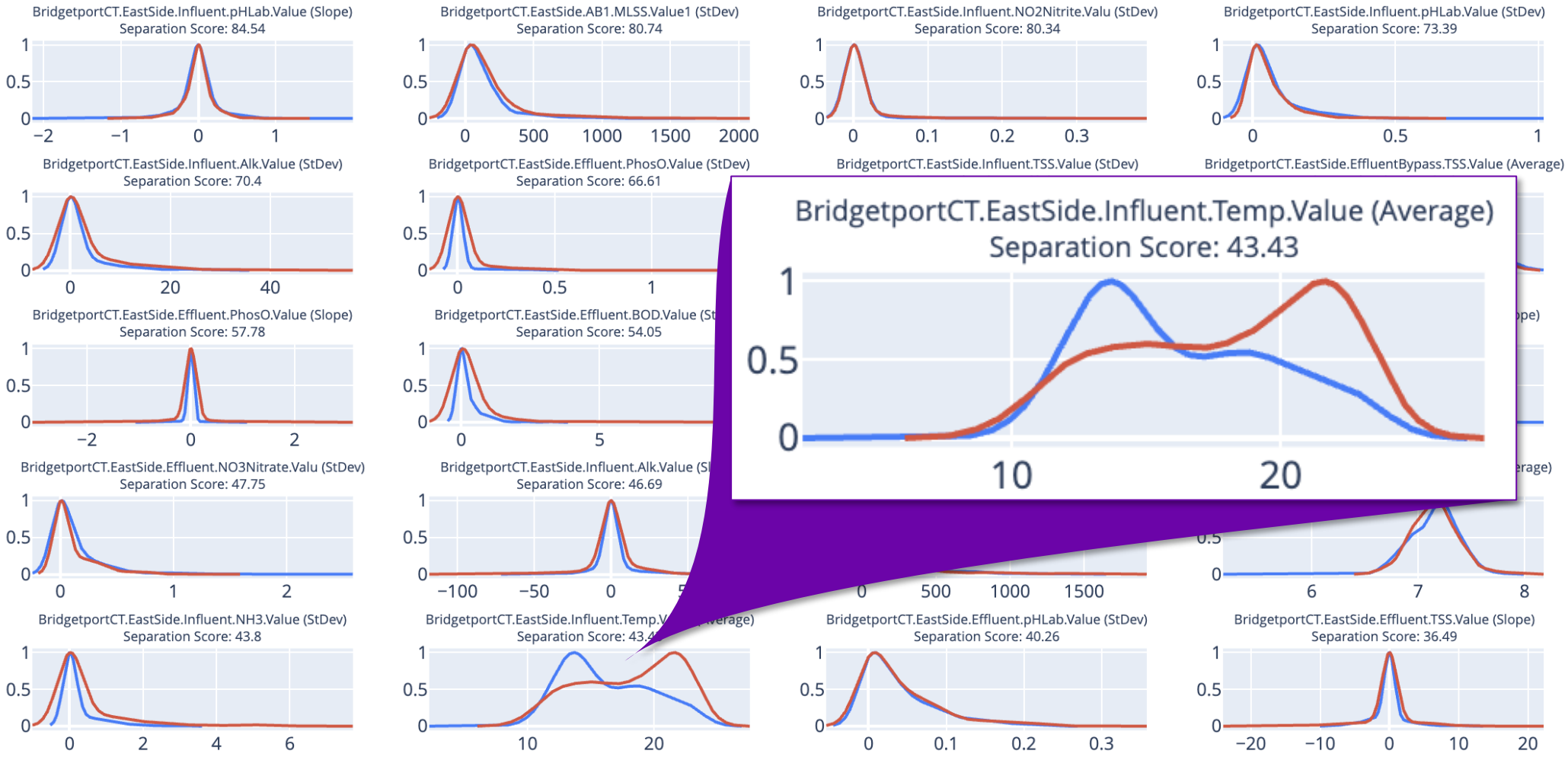
Separation Analysis



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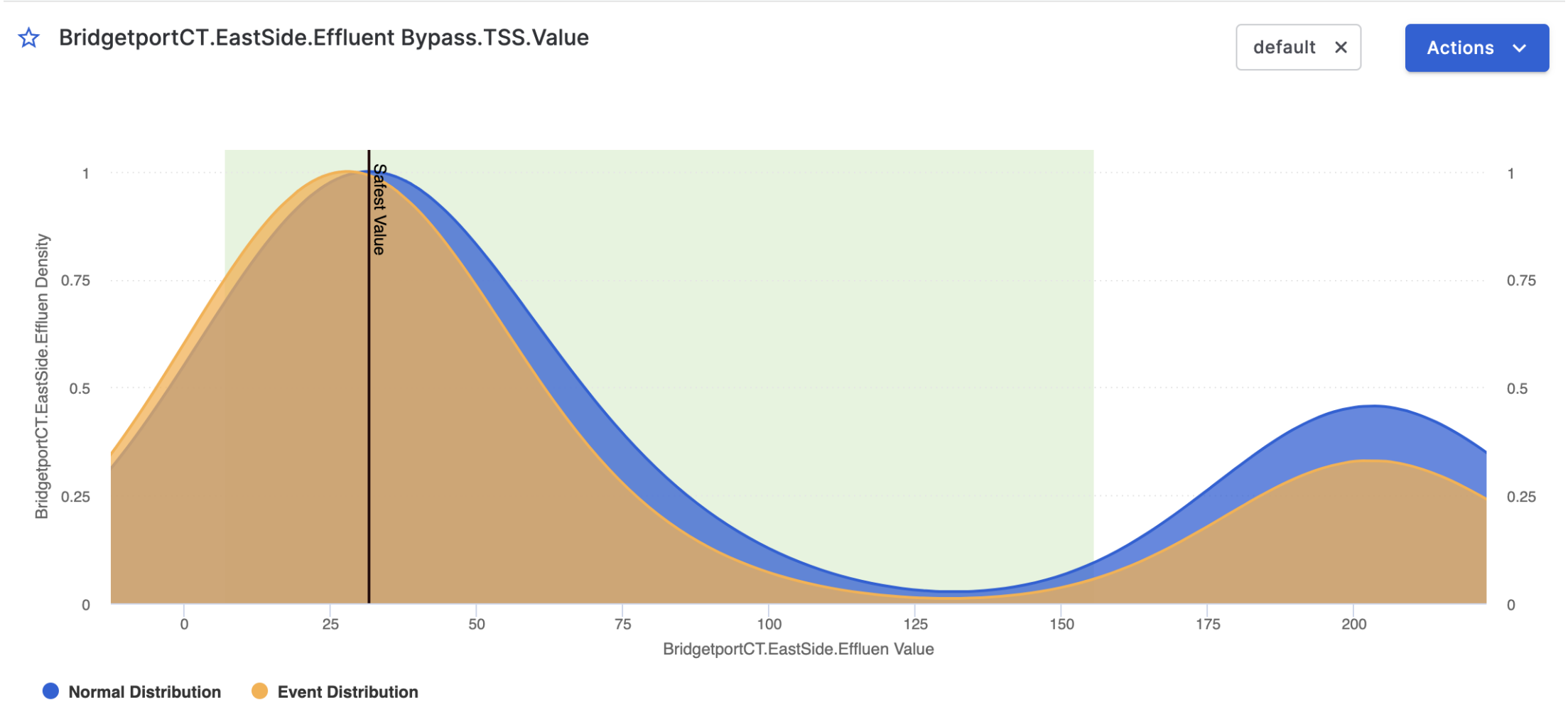

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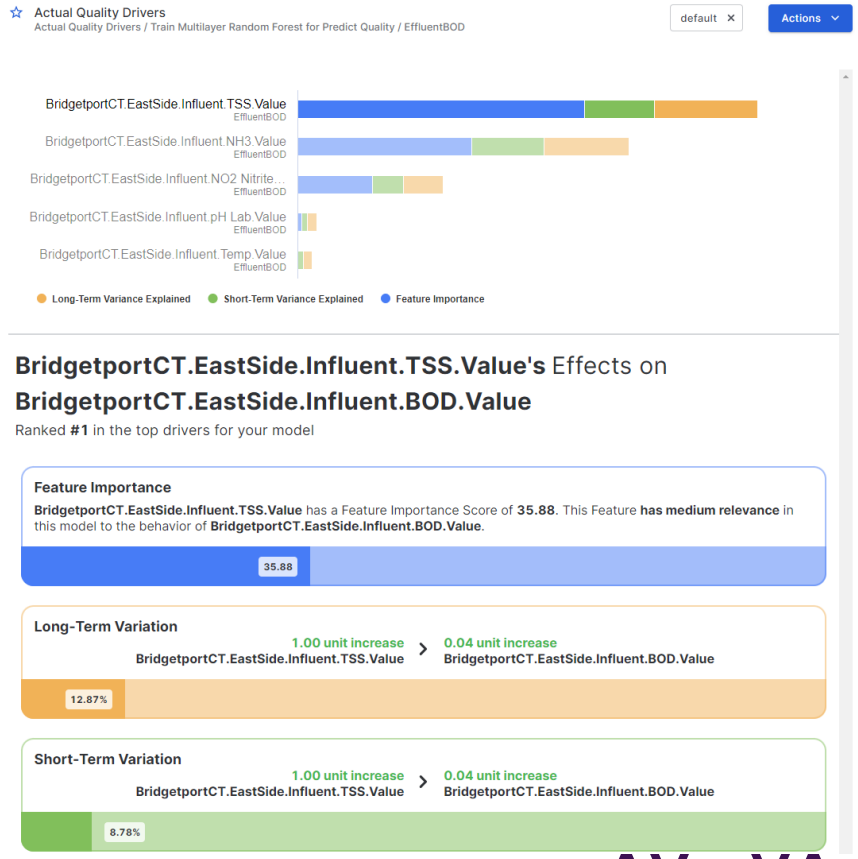
Predict Biological Oxygen Demand

- Required for Dissolved Oxygen prediction
- 5+ day advantage over lab results



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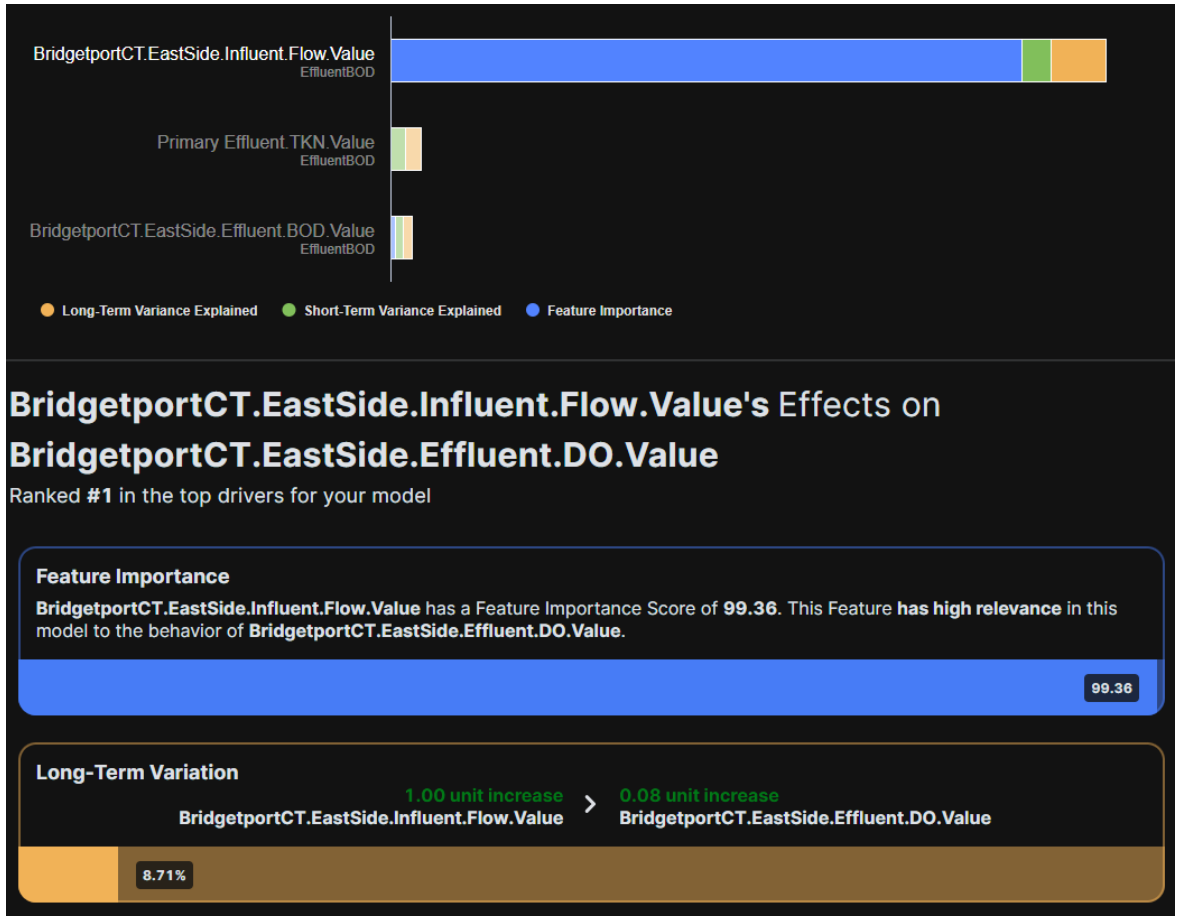
Predict Dissolved Oxygen

Dissolved Oxygen Predictions

- Exploring dataset for modeling opportunities
- Predictions could help reduce energy use



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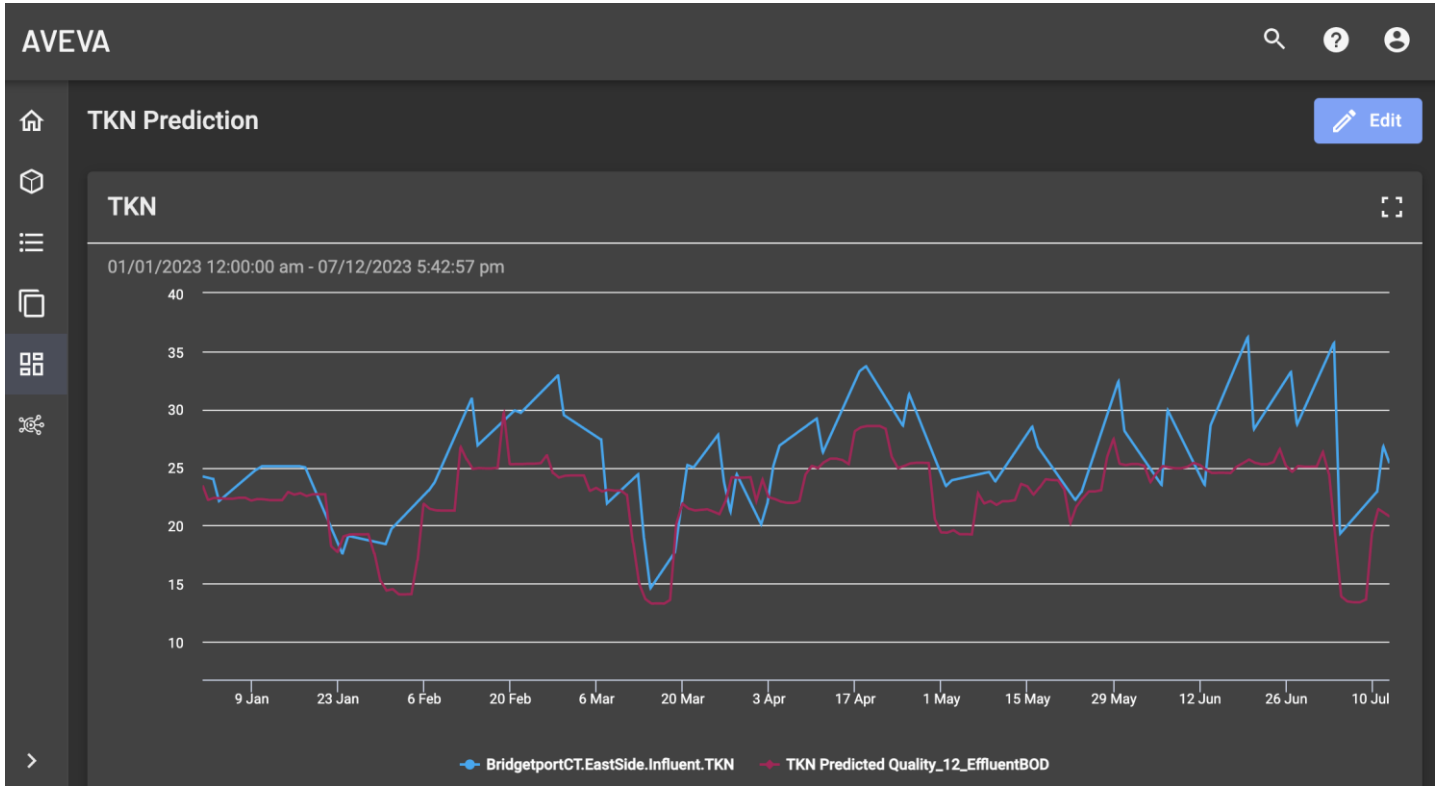
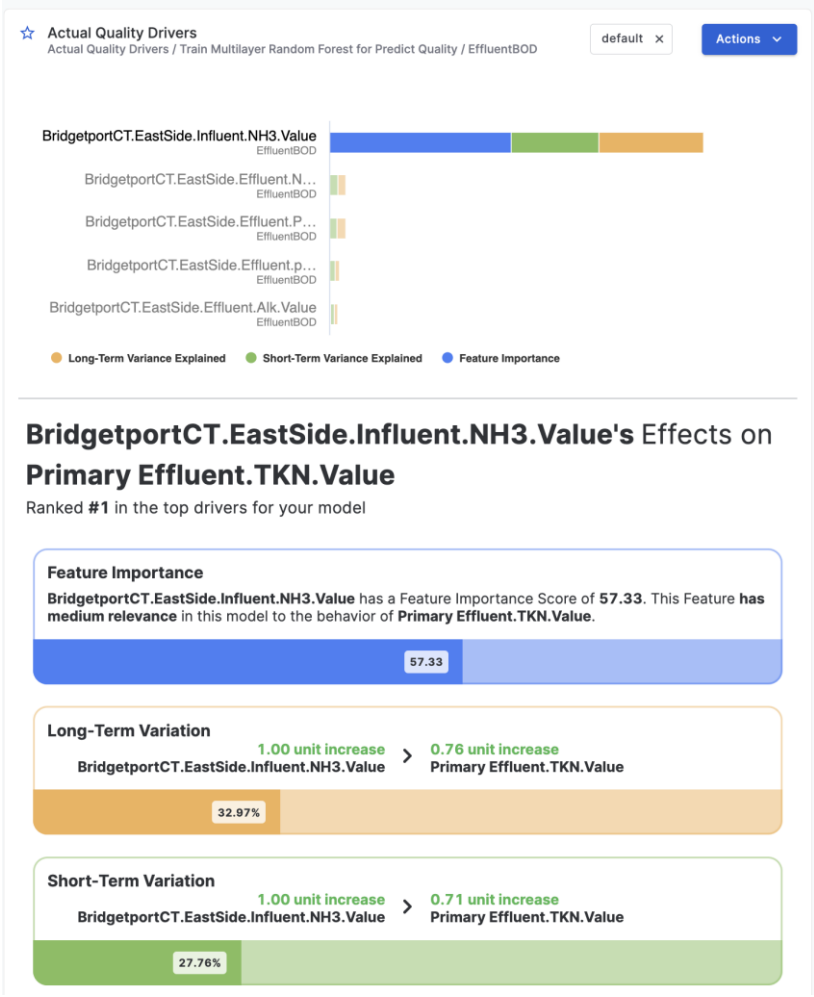
Predict Total Kjeldahl Nitrogen (TKN)

- Required to make other biological process predictions





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Next Steps

- Add additional instrumentation
- Utilize AVEVA Advanced Analytics' controllable inputs and limits
- Generate process control suggestions from AVEVA Advanced Analytics models
- Finalize AVEVA Connect Visualization content showing inputs, predictions, and suggestions
- Incorporate AVEVA Advanced Analytics data into on-premise or cloud SCADA platforms

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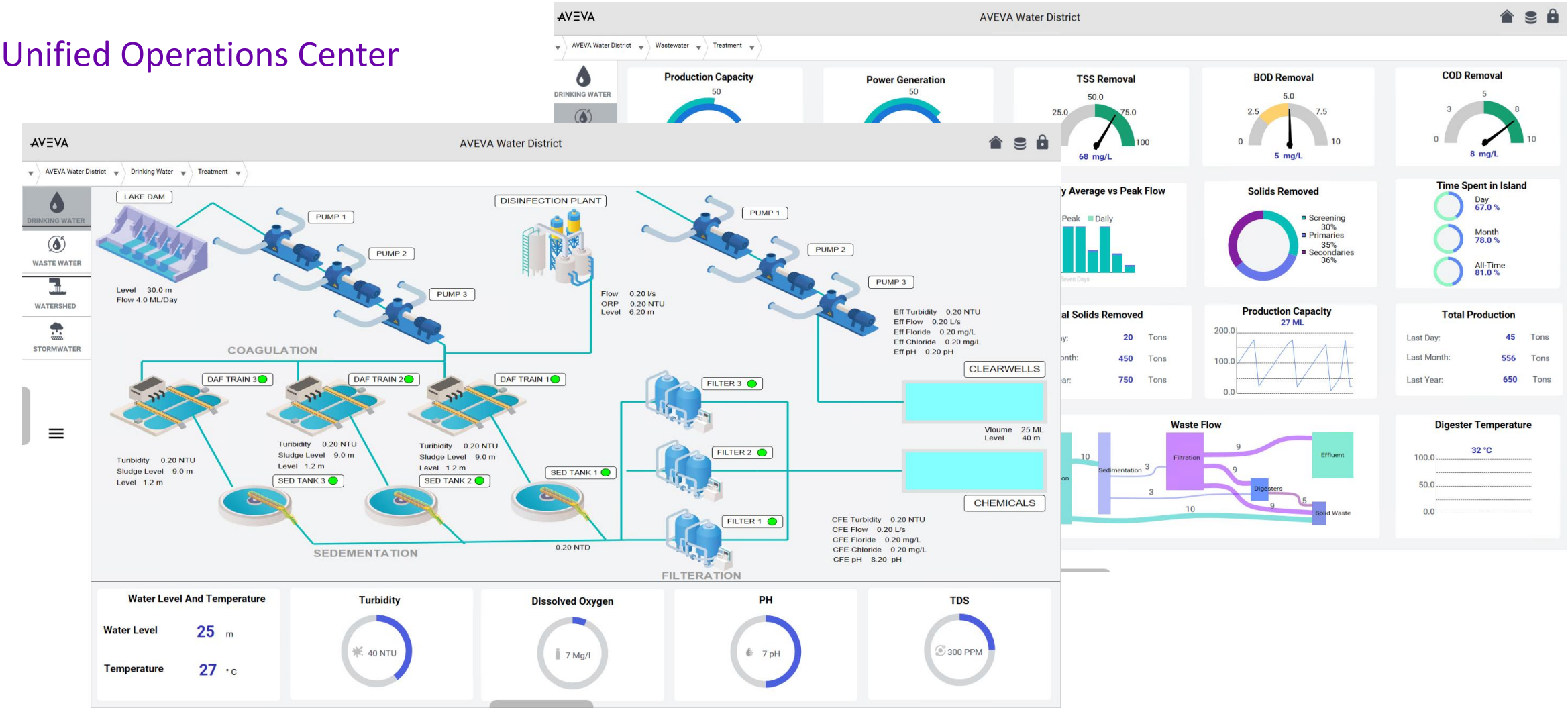
Looking to the Future

Unified Operations Center



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- eric.conder@inframark.com

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Questions?

Please wait for the microphone.

State your name and company.

Please remember to…

Navigate to this session in the mobile app to complete the survey.

Thank you!

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AVEVA

Recommended Sessions

Secure data sharing at scale with the AVEVA Data Hub Community

Tuesday, October 24 @ 2:50pm
Room 2004

Unlocking the power of AIOps for IIoT with AVEVA Data Hub and AVEVA Advanced Analytics
Accenture

Tuesday, October 24 @ 3:50pm
Room 2004

Introduction to AVEVA's Developer Program

Tuesday, October 24 @ 4:30pm
Room 2004

Enabling end-to-end continuous biomanufacturing by leveraging real-time data in the cloud
Biosana

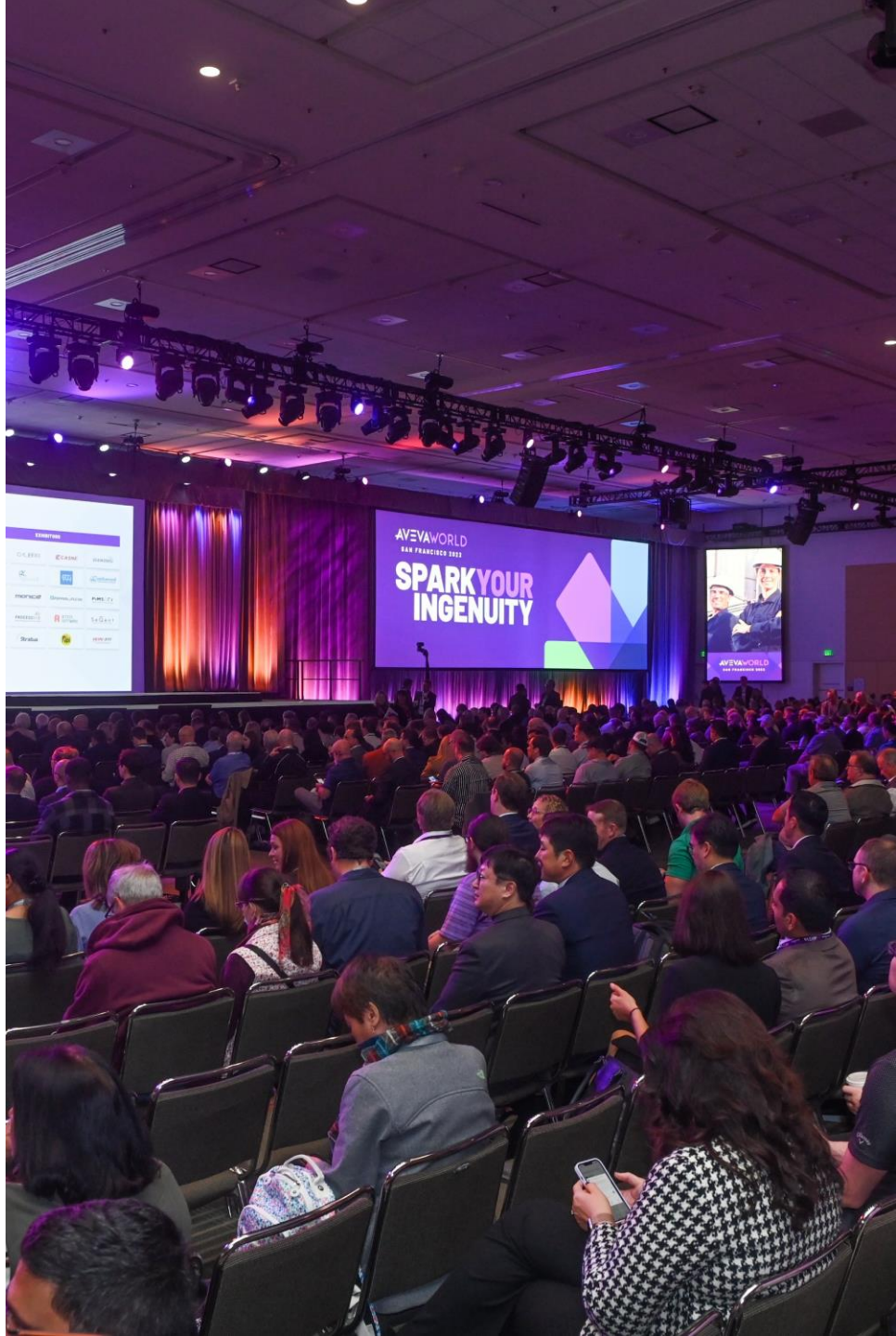
Wednesday, October 25 @ 8:40am
Room 2004

Uniting AVEVA Data Hub and Advanced Analytics with IOTA View, for Proactive Well Maintenance
Devon Energy

Wednesday, October 25 @ 10:20am
Room 2004

Sharing data across Quebec Iron Ore's IT and OT ecosystem with AVEVA's cloud technologies
Quebec Iron Ore

Wednesday, October 25 @ 1:30pm
Room 2004



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ABOUT AVEVA

AVEVA is a world leader in industrial software, providing engineering and operational solutions across multiple industries, including oil and gas, chemical, pharmaceutical, power and utilities, marine, renewables, and food and beverage. Our agnostic and open architecture helps organizations design, build, operate, maintain and optimize the complete lifecycle of complex industrial assets, from production plants and offshore platforms to manufactured consumer goods.

Over 20,000 enterprises in over 100 countries rely on AVEVA to help them deliver life's essentials: safe and reliable energy, food, medicines, infrastructure and more. By connecting people with trusted information and AI-enriched insights, AVEVA enables teams to engineer efficiently and optimize operations, driving growth and sustainability.

Named as one of the world's most innovative companies, AVEVA supports customers with open solutions and the expertise of more than 6,400 employees, 5,000 partners and 5,700 certified developers. The company is headquartered in Cambridge, UK.

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