

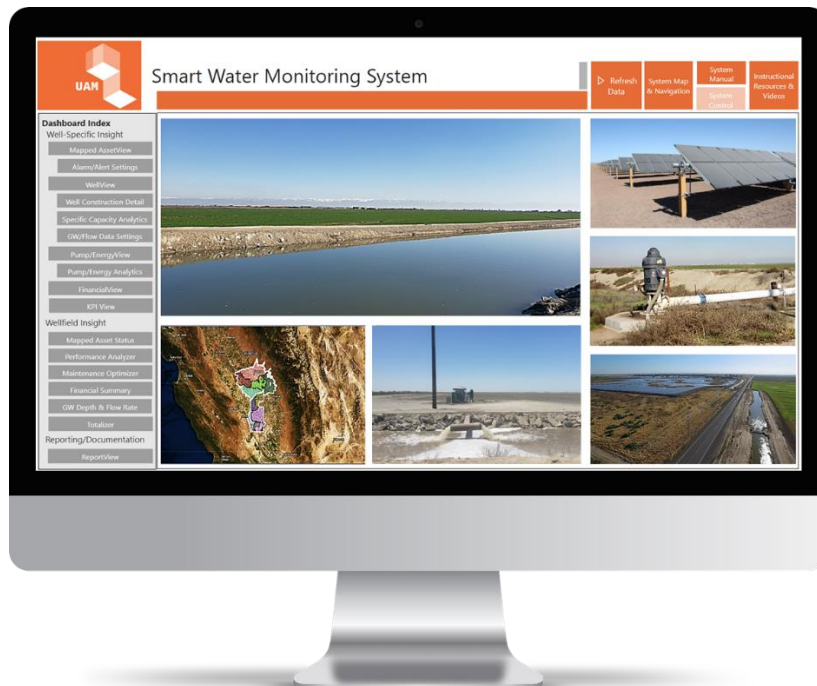


Utilities Asset Management LLC



# SMART WATER

*Addressing the Challenges of  
Groundwater Asset Management*



**IoT Monitoring, Analytics & Business Intelligence System**

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## WHY SMART WATER? IT PAYS

Large municipal and agricultural groundwater supply systems require hundreds of millions of dollars of capital investment and significant recurring operating and maintenance costs. National groundwater infrastructure is valued in the billions of dollars. Water asset managers are facing growing challenges with drought, aging infrastructure, rising energy costs, labor skills shortages, and a tightening regulatory environment focused on real time reporting, water conservation, user efficiency standards and altered water rights. Successfully navigating these challenges requires:

- **Acquiring Actionable Data**– water supply wells operate out of sight, deep below the surface in harsh environments, where visibility is limited, and risks are long without real time data.
- **Avoiding System Failure** – groundwater resources and equipment are under stress, but timely data and decisive action can avoid failure, downtime, and costly repairs.
- **Extending Asset Lifespans and Resiliency** – the acquisition and monitoring of mechanical and down-hole operations data combined with strong asset management will extend system lifespans and improve resiliency.
- **Improving Operations and Cost Efficiency** – maximizing asset value and meeting day-to-day operations and maintenance (O&M) demands in a timely and cost-effective manner dramatically increases the life cycle value of your assets.

Some of the larger utilities and water consumers have adopted smart water systems and invested heavily in IT infrastructure and analysts to address these issues. With the advent of IoT, such heavy investment can be avoided by adopting cost-efficient cloud-based asset management and business intelligence systems, such as UAM’s Smart Water platform.

Whether you are a large or small water user, Smart Water offers unprecedented value by delivering “big data” and analytics heretofore unavailable. The business case is compelling for investing in Smart Water to look after your assets, operations, water resources and money. Smart Water technologies deliver quantifiable results and huge savings on operations performance, enhance energy efficiency, boost labor productivity, and achieve high returns on investment. Paybacks are short.

Utilities Asset Management’s (UAM) Smart Water platform gives you a state-of-the-art tool that provides unprecedented data visibility and decision analytics to implement best asset management practices in real time across your water and power value chain. A single source of truth will inform executive, operations, and financial decisions where data was previously lacking.



## SMART WATER PLATFORM ESSENTIALS

Let's start by defining a smart system in the context of groundwater supply. At its core, a Smart Water system is comprised of three principal components:

- **At-well Hardware & Telemetry:** This is where the rubber meets the road, and consists of an at-well integrated sensor, gateway, and telemetry package.
- **Data Storage/Management:** A cloud-based, robust data storage and management element which ingests streaming data, organizes, and stores the information for on-demand use.
- **User Interface and Analytics:** A software suite/package that provides for visualization and analysis of the resultant data set.

**Sensor Package:** Sensor technology has advanced to the extent that Smart Water systems can be cost-effectively instrumented to capture system location/GPS coordinates and critical performance metrics - such as power/energy, pump flow, and depth, motor temperature, vibration, vibration frequency, and water quality criteria. Armed with the targeted data, Smart Water system users can then visualize and analyze streaming and historical data – but buyer beware, systems' capabilities vary greatly across software/intelligence platforms.

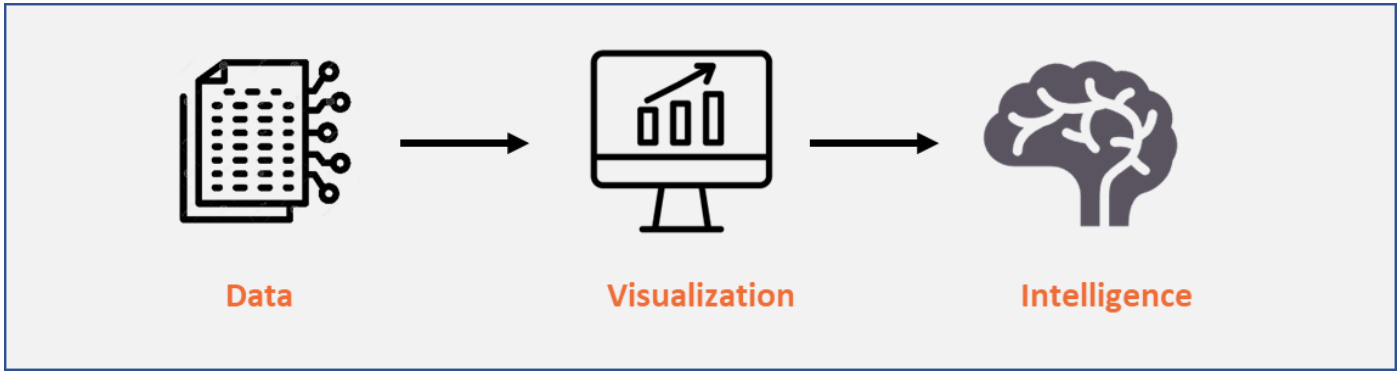
**Gateway:** The gateway must be matched to system end-use requirements: it is critical that the selected unit can:

- Support remote access and management.
- Ingest data from the preferred sensor suite (flexible communications protocols/ports).
- Manage data logging/storage and transmission in a manner that backs-up and efficiently transfers information consistent with cloud capabilities.
- Enable required at-Edge functionality (e.g. alerts and alarms).
- Operate in a resilient manner with robust telemetry to ensure data security and transfer.

**Telemetry:** Availability of service and cost drive selection of telemetry, with options including cellular, satellite, and mesh networks based on location service availability.

**Cloud Services:** Using established cloud-based infrastructure as the backbone of an IoT Smart Water system offers many benefits - lowers costs, streamlines workflows, and eliminates the need for in-house hardware and IT personnel. Key attributes should include data security, maintenance, backup and support. With this in mind, UAM's IoT system is built around Microsoft's Azure Cloud platform.

**User Interface:** Lastly, but of critical importance, is the user interface and analytics to support business decision-making. Options vary from simple data strip charts, user-generated drag-and-drop data dashboards, to powerful, focused business intelligence-driven platforms. UAM employs Microsoft's industry-leading Power BI interactive, visually immersive intelligence platform.

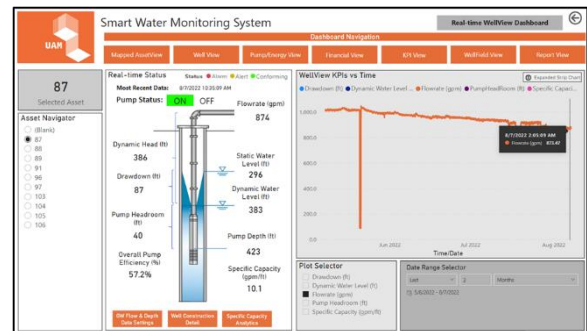


## UAM SMART WATER SYSTEM FEATURES & BENEFITS

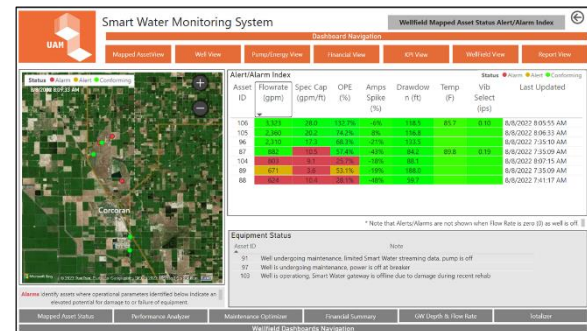
UAM’s Smart Water system is an enterprise-level asset management tool providing users unprecedented operational visibility and intelligence to support improved performance/cost, optimizing maintenance functions, improving stakeholder communications, increasing resiliency, and maximizing asset value and lifespan. The dashboard-driven system is comprised of a comprehensive set of dashboards providing visibility/insight at the individual, multi-well, and wellfield level in real time. Below are selected examples depicting system utility.

**Increase Visibility:** For individual wells, *Mapped Asset View, WellView, Pump/Energy View, KPI View, and Financial View* dashboards provide real-time and user-selected time-based intelligence for monitored sensors and key performance indicators (KPIs), costs, and related trends over user-selected time frames.

By example, the *WellView dashboard* to the right provides at-a-glance well information including operational status, groundwater extraction flowrate, static and pumping water levels, drawdown, pump headroom, and dynamic head. Trends in flowrate, groundwater depth, specific capacity and other metrics can be evaluated by day, week, month, and year.

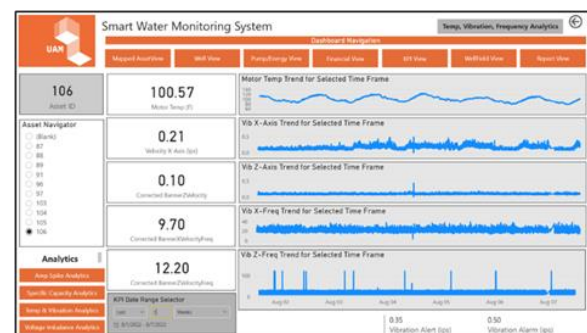


**Monitor Performance:** At the wellfield level, the Mapped Asset Status dashboard provides at-a-glance summary of key operating conditions as well as alerts/alarms designed to protect critical equipment and show/predict performance levels/trends and system efficiency.



Water system owners and operators can easily rank assets by any metric and quickly identify operational performance status as well as significance/rate of decay.

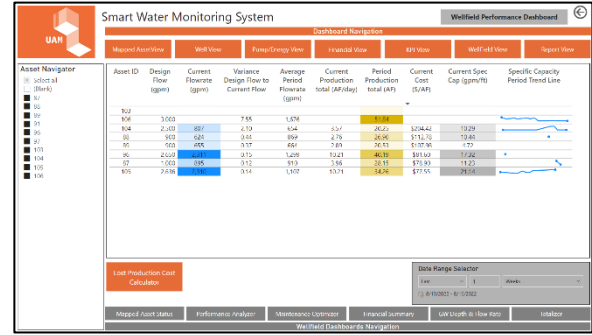
**Failure Protection:** Smart Water provides critical equipment protection in two modes: (1) through at-Edge alert/alarming which contacts selected organization personnel via SMS, email, and/or phone; and (2) by monitoring selected metrics and visually alerting users within Smart Water dashboards.



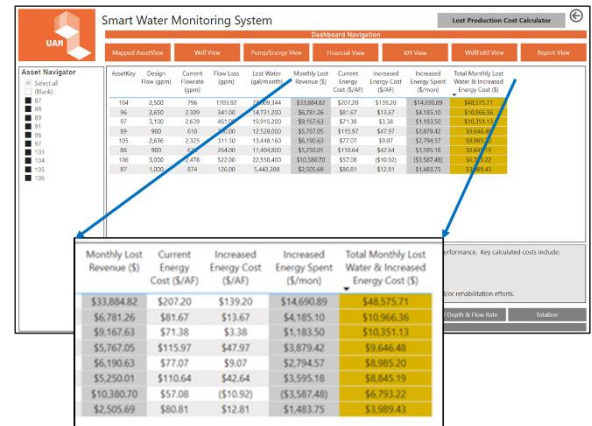
Dashboards that focus on Failure Prediction analytics include real-time and trending metrics such as voltage imbalance, amperage spiking, motor temperature, vibration, and vibration frequency.



**Performance Optimization:** Smart Water wellfield dashboards, including *Mapped Asset Status*, *Performance Analyzer*, *Maintenance Optimizer*, *Financial Summary*, *GW Depth & Flowrate*, and *Totalizer* allow users to monitor performance, quantify production, and rank assets by selected metrics (e.g., production/loss of production, specific capacity, etc.) to support optimal operational and maintenance decision-making, as well as supporting tracking/reporting requirements.

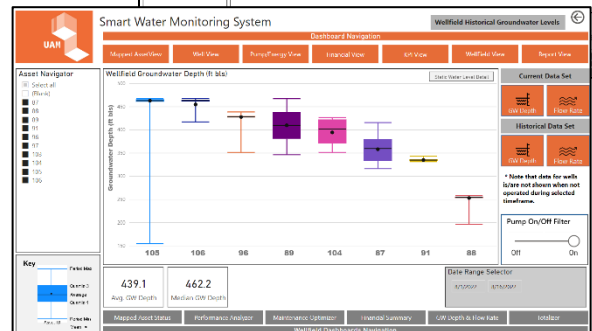
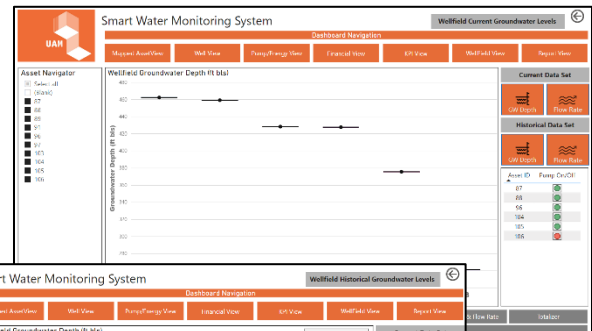


**Cost Optimizer:** The system's *Production Cost Calculator* enables users to quantify and rank the value of declining/lost production, degrading operational efficiency and energy cost trends for each well in a portfolio. Armed with this information, water managers can prioritize well production schedules, optimize maintenance programs and budget spending to achieve the maximum economic return.

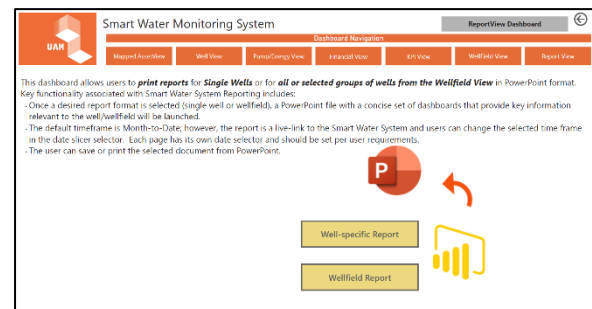


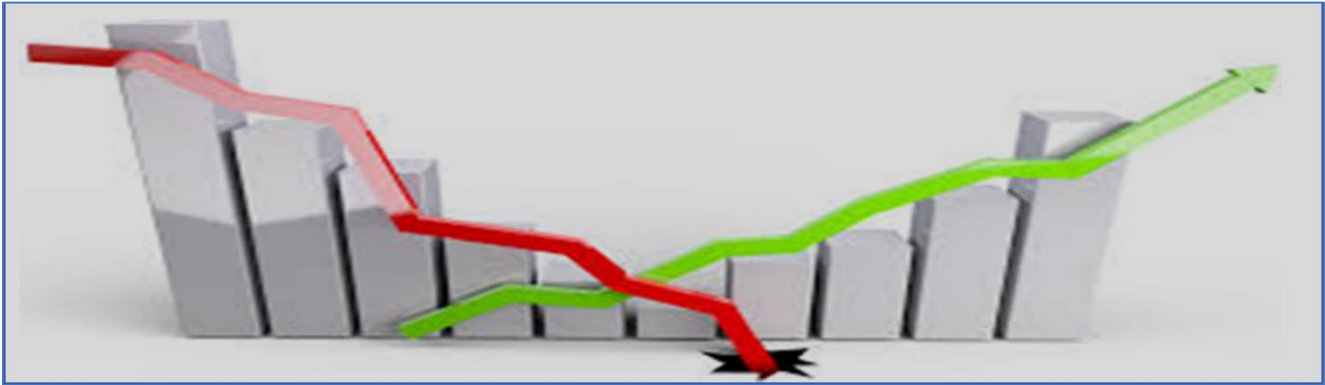
In the example to the right, cost impacts range from \$48,575/month to \$ 3,989/month for individual wells. Sub-optimal performance costs associated with the eight wells evaluated totals \$108,152.72/month or \$1.2M annually.

**Meet the Challenges of Sustainability Regulations:** Curtailment of water production and diversions, mandatory conservation and efficiency standards, and stringent operations reporting are regulatory challenges that Smart Water arms you to meet. Smart Water allows users to visualize data and evaluate trends in asset performance across a portfolio in real-time and report to stakeholders or regulators. The data can be sliced and diced in multiple time frames.



**Improve Stakeholder Communication:** One of the powerful features of Smart Water is its reporting capabilities. The system can automatically generate, save, and email selected reports to stakeholders which summarize well and wellfield information in PowerPoint or PDF formats on a scheduled or on-demand basis.





## SMART WATER CALL TO ACTION

Deploying Smart Water is the intelligent financial and operational decision. Armed with real-time and historical water supply system operational big data and analytics, water managers can optimize their operations and maintenance activities, reduce costs, and increase asset lifespans and values.

The payback on Smart Water is typically a few months when measured in quantifiable O&M savings, increased water flows, equipment protection, and reduced system downtime. The ROI should exceed 500%.

Contact UAM for a [live demo](#) and/or further information regarding how our Smart Water system can support your asset management needs at:

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