



# AQUA WATCH

# Smart Water Integrated Management System (SWIMS)

*Water Management, Simplified*

## OVERVIEW

We save time, money, and the environment.

Water management cannot occur in isolation—the health of our waterways reflect our collective actions across both urban and rural landscapes. This interconnection calls for a holistic approach, where integrated water management becomes essential to fostering sustainable urban growth, protecting the environment, and enhancing community well-being.

By harnessing user-friendly, reliable, and affordable technology, real-time data analytics, and geospatial integration, our approach streamlines the way cities monitor, manage, and respond to water-related challenges.



### Continuous Water Quality Monitoring:

Deploying advanced sensors across key points in the water network, the system continuously tracks parameters such as turbidity, pH, dissolved oxygen, temperature, and electrical conductivity.

## CHALLENGES



Waterways and global environments face mounting pressures from climate change, population growth, and aging infrastructure. These factors contribute to increased risks of flooding, water contamination, and inefficient resource use. Traditional monitoring systems often lack the agility and predictive capabilities required to address these dynamic challenges effectively.

## SOLUTIONS



Our Smart Water Integrated Management System (SWIMS) provides a comprehensive, scalable solution that integrates continuous water quality monitoring, AI-powered visual analytics, and real-time data visualisation into a unified platform.



### AI-Powered Visual Monitoring:

Leveraging AI-driven analysis — the system detects illicit discharges, tracks sediment movement, and provides early flood warnings by monitoring water levels, flow rates, and landscape changes.



### Data and Analysis Services

Combining water quality data, visual AI, and geospatial information, the system offers real-time insights for improved situational awareness and decision-making.

## Data-Driven Decision Making

Fragmented data makes it difficult to drive strategic decisions and long-term planning. Our platform integrates geospatial analytics with real-time data to deliver useable information for smarter policy-making and infrastructure management. This empowers stakeholders to plan proactively, align with sustainability goals, and unlock funding opportunities, all while enhancing transparency and accountability.

## Operational Efficiency & Cost Savings

Manual monitoring and outdated infrastructure drive up operational costs and waste resources. Our automated alerts, reporting, and visual analytics streamline workflows, optimise resource allocation, and minimise human error. This boosts efficiency, cuts maintenance costs, and extends infrastructure lifespan. The result? Scalable solutions that free up budgets for innovation and strategic growth.

## Enhanced Risk Mitigation:

Flooding and contamination pose serious risks to infrastructure, operations, and regulatory compliance. Traditional monitoring methods lack the speed and accuracy needed to prevent costly disruptions. Our smart water platform leverages real-time data and advanced machine learning for precise flood forecasting and contamination alerts, reducing response times and mitigating risks. This proactive approach ensures environmental compliance, safeguards assets, and protects your brand reputation.

# Strategic Water Intelligence & Management System (SWIMS)

# IoT WAQA (Water Alerts and Quality Array

## PRODUCT OVERVIEW

The AquaWatch Water Quality Monitoring Array is an in-situ, real-time, high-accuracy monitoring system designed for continuous water quality assessment. It provides plug-and-play deployment, full calibration, and a hot-swap servicing model for uninterrupted operation. Built to meet the needs of Councils, utilities, agriculture, and industry, the array delivers reliable, regulatory-grade data with minimal maintenance.

## KEY FEATURES

- Multi-Parameter Monitoring:** Standard sensors include Dissolved Oxygen (DO), pH, Turbidity (NTU), Temperature, and Electrical Conductivity (EC), with Ammonium (NH<sub>4</sub><sup>+</sup>) available as an optional add-on.
- Real-Time Data Transmission:** 4G/LTE and NB-IoT connectivity for seamless remote monitoring.
- Full Calibration & Servicing:** Includes comprehensive sensor calibration, warranty, and ongoing servicing on a hotswap basis to ensure continuous data collection.
- Infrastructure-Free Deployment:** Simple installation with no specialised infrastructure requirements.
- Rugged, Field-Ready Design:** Built to IP67+ standards for use in environmental conditions.

## TECHNICAL SPECIFICATIONS

Parameter	Measurement Range	Accuracy	Resolution
pH	0-14 pH	±0.1 pH	0.01 pH
Dissolved Oxygen (DO)	0-20 mg/L or 0-200% saturation	±0.1 mg/L	0.01 mg/L
Turbidity (NTU)	0.1-1000 NTU	±5% or 0.3NTU	0.01 NTU
Electrical Conductivity (EC)	0-200 mS/cm	<1% or 0.01mS/cm	0.01 mS/cm
Temperature	-5°C to 50°C	±0.2°C	0.01°C
Ammonium (NH <sub>4</sub> <sup>+</sup> -N) (Optional)	0-100mg/l (0-1000mg/l optional)	±10% or ±.05mg/L	0.01 mg/L

## DATA AND COMMUNICATION

- Data Logging:** Continuous measurement with cloud-based data storage
- Communication Protocols:** Cellular: 4G LTE-M / NB-IoT
- Cloud Integration:** Secure cloud dashboard for real-time access and historical analysis

## POWER AND DEPLOYMENT

**Power:** Rechargeable lithium battery (3-6 months per charge)

### Deployment Configurations:

- Fixed station (bridge, pier, or pole-mounted)
- Buoy attachment



## SERVICING AND SUPPORT

- Full Calibration & Warranty :** Each sensor is factory-calibrated and comes with a full warranty.
- Hotswap Servicing Model:** Rapid replacement service minimises downtime, ensuring uninterrupted data collection.
- Remote Support & Monitoring:** Our team provides expert technical support and troubleshooting for all deployments.

## APPLICATIONS

- Councils, Local Government & Utilities** – Compliance monitoring, wastewater tracking, resource management
- Agriculture:** Regulatory reporting, risk management, irrigation and livestock water quality monitoring
- Construction:** Sediment runoff and erosion control monitoring
- Smart Cities:** Stormwater quality assessment and regulatory compliance
- Industry:** Industrial discharge monitoring and environmental impact assessments



**Effortless Deployment**  
No infrastructure required; simple, fast installation



**Hands-Off Maintenance**  
Full calibration, warranty, and servicing included



**Guaranteed Uptime**  
Hotswap service model ensures continuous operation, no data gaps



**Real-Time, Remote Access**  
Live insights via 4G/LTE & cloud dashboard



**Scalable & Cost-Effective**  
Works for both small & large networks



# AquaWatch Smart Water Integrated Management System (SWIMS)

# AW-108 Camera and Visual AI

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## PRODUCT OVERVIEW

AquaWatch's AI-powered camera-based monitoring solutions provide real-time, automated tracking of sediment discharge, flood events, and trash rack/GPT blockages. Designed for environmental compliance, early warning systems, and infrastructure management, these solutions integrate advanced computer vision AI models to provide useable and useful alerts. We also work with clients to develop and customise additional AI models tailored to their specific monitoring needs.

## KEY FEATURES

- 4K Resolution at 40 FPS** – High-definition imaging for precise environmental monitoring.
- Infrared Night Mode** – Integrated IR for 24/7 visibility in low-light conditions.
- Edge AI Processing** – Real-time image analysis using the Nvidia Jetson Nano/Xavier NX platform.
- Fully Waterproof & Submersible** – IP68-rated, capable of deployment above and below ground.
- Privacy & Focus Controls** – User-defined focus areas to enhance monitoring effectiveness and data security.
- Power Options** – Supports Solar Power or Power over Ethernet (PoE) for flexible deployment.
- Configurable Alerts** – Users can set thresholds for automated notifications.

## CAMERA BASED MONITORING MODELS

Model	Primary Function
Discharge Tracking	Monitors sediment runoff and discharge plumes
Flood Alert	Detects rising water levels & early flood signs
Trash Rack / GPT Monitoring	Identifies blockages & debris accumulation
Custom Models	Tailored monitoring solutions for client needs

## DATA AND COMMUNICATION

Category	Specifications
Connectivity	Wired: 100Mbit Ethernet Wireless (GSM): LTE CAT4 (
Storage	SSD: PCIe Gen2, 1GB/s, 128GB-1B, NVMe M.2 2242
USB Ports	Internal: 2x USB 2.0 (480Mbps)

## POWER AND DEPLOYMENT

- Power Options:**
- Solar-powered with battery backup for off-grid use
  - PoE (Power over Ethernet) for streamlined wired installations
- Deployment Configurations:**
- Above-ground** (current infrastructure, pole-mounted)
  - Underwater** (fully submersible up to 100m depth)



## SERVICING AND SUPPORT

- Remote Support & Troubleshooting:** Cloud-based diagnostics and firmware updates.
- Edge AI Processing at Capture** – Reduces bandwidth use and allows real-time decision-making at the source.

## APPLICATIONS

- Councils & Utilities:** Stormwater management, compliance, sediment control, flood risk management
- Construction & Infrastructure:** Environmental impact assessment, erosion monitoring, compliance
- Ports & Coastal Management:** Tracking sediment drift & dredging compliance
- Smart Cities:** AI-powered flood response and stormwater infrastructure optimisation
- Industrial & Heavy Industry:** Discharge tracking, debris monitoring for regulatory compliance
- Custom Monitoring Needs:** Further AI model development for specialised applications



**Edge AI Processing**  
Real-time analysis at the source reduces bandwidth needs and improves response.



**Infrared Night Vision**  
Integrated IR for 24/7 monitoring, even in low-light or submerged conditions.



**4K Ultra-High-Resolution Imaging**  
Capture precise environmental data with 40 FPS clarity.



**Model Optimisation**  
Fine-tune AI models for maximum accuracy and efficiency in your specific applications.



**Scalable & Cost-Effective**  
Works for both small & large networks

# AquaWatch Smart Water Integrated Management System (SWIMS)

## Data & Analysis Services

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### PRODUCT OVERVIEW

AquaWatch's Data & Analysis Services transform raw environmental data into useable insights by using cutting-edge technology and combining real-time sensor data with existing datasets to create an integrated environmental understanding that enables effective decision-making and management.

Our systems rely on advanced automation and machine learning to create actionable insights for a variety of applications, from ecosystem management to industrial compliance and public health protection.

Customisable automated reporting and alerting ensures that each user receives the most relevant information, helping organizations proactively respond to environmental changes and make data-driven decisions.

### KEY FEATURES

- **Full Data Integration:** Portal, API, and customised reporting for seamless data access from all hardware.
- **GIS & Spatial Analysis:** Identify trends, risks, and optimise environmental strategies.
- **Regulatory Compliance & Risk Management:** Automated reporting for resource consents, stormwater compliance, and pollution tracking.
- **Operational & Predictive Intelligence:** Linking water data with infrastructure performance and land use to optimise decision-making.
- **Digital Twin & Remediation Modeling:** Scenario-based environmental simulations for proactive planning.



### DATA AND PRIVACY

- **Secure Data Handling:** Ensures privacy and protection of sensitive environmental data.
- **Controlled Public Sharing:** Customers can share data without risking system integrity.
- **Regulatory Compliance:** Meets industry security and environmental data standards.

### DELIVERY AND INTEGRATION

- **Flexible Delivery:** Cloud-based and on-premise options for diverse operational needs.
- **Seamless API Integration:** Compatible with operational, enterprise systems, external websites, and government portals.
- **Automated Alerts & Notifications:** Custom triggers for real-time insights and risk mitigation.

### PROJECT MANAGEMENT SUPPORT

- **End-to-End Implementation:** Expert guidance from planning to execution.
- **Partner Collaboration:** Works with stakeholders for comprehensive environmental strategies.
- **Ongoing Support & Optimisation:** Continuous monitoring, updates, and improvements.

### APPLICATIONS

- **Councils & Utilities:** Compliance tracking, stormwater & wastewater management.
- **Smart Cities:** AI-powered environmental risk assessment and pollution mitigation.
- **Construction & Infrastructure:** Sediment & erosion control plans, compliance assessments, resource consent reporting.
- **Agriculture & Irrigation:** Water quality management, impact identification & mitigation, compliance reporting.
- **Mining & Heavy Industry:** Pollutant discharge monitoring, environmental impact tracking.
- **Public Health & Recreation:** Swimmability assessments, blue-green algae risk detection.



**Secure, Shareable Data**  
Ensuring system integrity while enabling controlled public insights.



**AI-Driven Environmental Insights**  
Turning data into predictive intelligence.



**Automated Compliance & Risk Management**  
Simplifying regulatory processes.



**Remediation & Digital Twin Modeling**  
Future-proofing environmental planning.



**Time & Cost Savings**  
Optimised analysis reduces operational burden and improves efficiency.



# AquaWatch Smart Water Integrated Management System (SWIMS)

# Integrated Management Case Study

Water Management, Simplified

## OVERVIEW

Deploying real-time water quality monitoring devices and AI cameras across utilities, resource users, farmers, and construction sites is transforming water management. AquaWatch's integrated system supports on-the-ground decisions while generating data that accumulates into catchment-wide improvements, providing robust evidence for regulation and policy development.

## PROJECT

AquaWatch deployed sensors and AI-enabled cameras across multiple sectors to monitor stormwater discharges, irrigation practices, sediment runoff, and construction site compliance. These deployments empower users to respond in real-time to pollution risks while contributing to a growing dataset that informs catchment health and regulatory oversight.

## METHODOLOGY

- **Targeted Deployment:** Site modelling ensures sensors are placed where risks are highest.
- **Continuous Monitoring:** Sensors track turbidity, dissolved oxygen, pH, conductivity, and temperature, while AI cameras detect discharges.
- **Smart Data Delivery:** Insights are pushed to dashboards and automated alerts, tailored to user needs.
- **Integrated Analysis:** Local data feeds into broader catchment models to track trends and identify pressure points.



## KEY RESULTS

- **On-the-Ground Impact:** Utilities reduced discharge risks; farmers improved sediment practices; construction teams avoided breaches.
- **Catchment-Wide Gains:** Local actions combined to reduce sediment loads and improve water quality.
- **Enterprise Insight:** Data comparisons across projects identified best practices and performance gaps, improving site management consistency.
- **Better Regulation:** Aggregated data strengthened consent processes and enabled regulators to target high-risk areas with evidence-based interventions.

## RECOMMENDATIONS

- Immediate: Expand deployment across high-risk sites to extend real-time management benefits.
- Medium-Term: Integrate cross-site data from multiple sectors into shared platforms for regional and enterprise-wide comparisons.
- Long-Term: Build data partnerships between operators and regulators to shape adaptive, evidence-based policies.

## CONCLUSION

### Cost and Time Savings:

The integration of real-time monitoring and AI analytics reduced manual site visits, enabled faster responses to pollution events, and streamlined compliance reporting for utilities, farmers, and construction operators.

### Data-Driven Environmental Management:

Continuous monitoring revealed how land use practices and stormwater discharges interact with natural processes, emphasising the need for adaptive management combining infrastructure improvements with catchment restoration.

### Scalable Impact:

The ability to compare data across sectors and sites enabled operators and regulators to scale successful interventions, improving catchment-wide water quality while building a robust foundation for evidence-based regulatory decisions.

