From Compliance to Global Impact

UK Section 82 success and the World Bank water monitoring initiative

Xylem International Dealer Meeting
New Orleans, LA

October 6-8 2025

The stakes are high

Section 82 compliance

The Environment Act sets a clear path to improving water stewardship across the UK with new monitoring standards.

By embracing its requirements, utilities can lead the way in protecting ecosystems, building public trust, and demonstrating environmental accountability through transparency and innovation.

However, failure to properly comply with Section 82 can result in enforcement actions, legal penalties, and significant reputational damage.

The cost of non-compliance is high—both financially and publicly.

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What does certainty look like?

We are experts with experience:

- Decades of delivering large-scale, complex solutions
- Consistent execution— on time, on budget, and on spec
- Extensive compliance and regulatory knowledge
- Stable supply chains and a track record of long-term operational support

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Three market leaders, one delivery engine

Section 82 compliance

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Proven Sensor Manufacturer

Xylem is a leading global water solutions company dedicated to advancing sustainable impact and empowering the people who make water work every day.

From moving, treating and measuring water to optimizing and maintaining water systems, Xylem collaborates with customers to solve their most critical challenges.

Together, we are building a more water-secure world.

- Sensor and instrumentation manufacturer of YSI systems
- Data telemetry, visualization, and GIS cloud platform
- Commissioning support
- Calibration, LIMs traceability

$8.1B globally
23k employees

Monitoring Solutions

M GROUP

Leading Services Provider

M Group helps our clients safeguard the water supply, improve environmental performance and manage demand for future generations. We enhance and extend asset life, ensuring compliance with water quality and environmental standards.

We support the delivery of water resource management plans, and we improve delivery and customer satisfaction.

- Proven T1 partner
- System Integration, Installation, and Maintenance
- Site surveys, groundworks
- Logistics

$2.3B globally
2.7k employees

Installation & Services

Jacobs

Global Consultancy

At Jacobs, we're challenging today to reinvent tomorrow – delivering outcomes and solutions for the world's most complex challenges. We provide end-to-end services in advanced manufacturing, cities & places, energy, environmental, life sciences, transportation and water.

From advisory and consulting, feasibility, planning, design, program and lifecycle management, we're creating a more connected and sustainable world.

- Stakeholder engagement
- Land management, ecology surveys, permits & FRAP
- GIS mapping, modeling & forecasting
- Digital Twins

$12B globally
45k employees

Global Consultant

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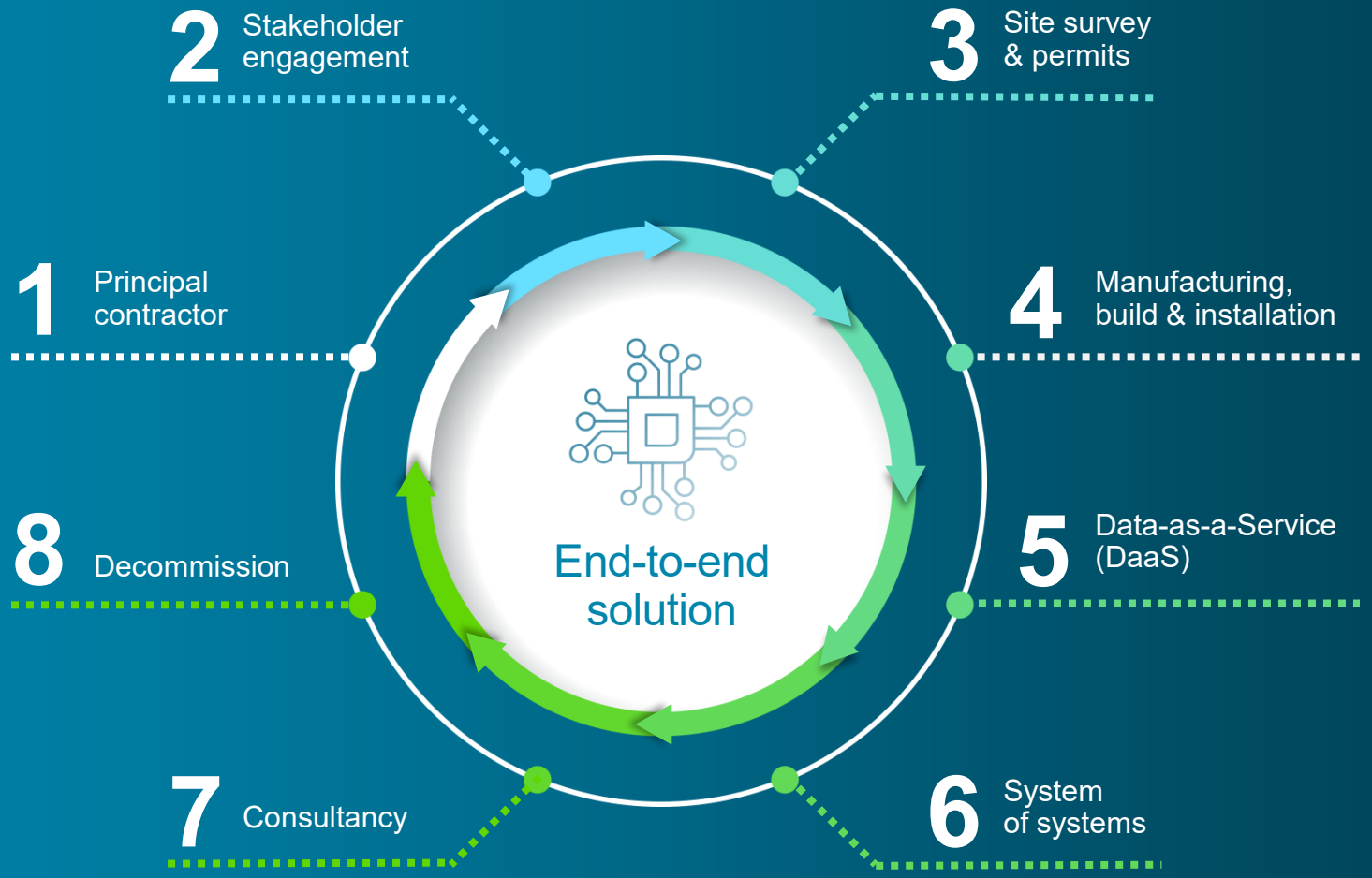

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CDM Principal Contractor

Client Engagement

Identify Sites

Agree Scope of Works

Agree Responsibility matrix (pick and mix to full end to end solution)

Desktop Survey

1 Principal contractor

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Identify landowners

Landowner engagement

Landowner negotiation

Land access

2 Stakeholder engagement

1 Principal contractor

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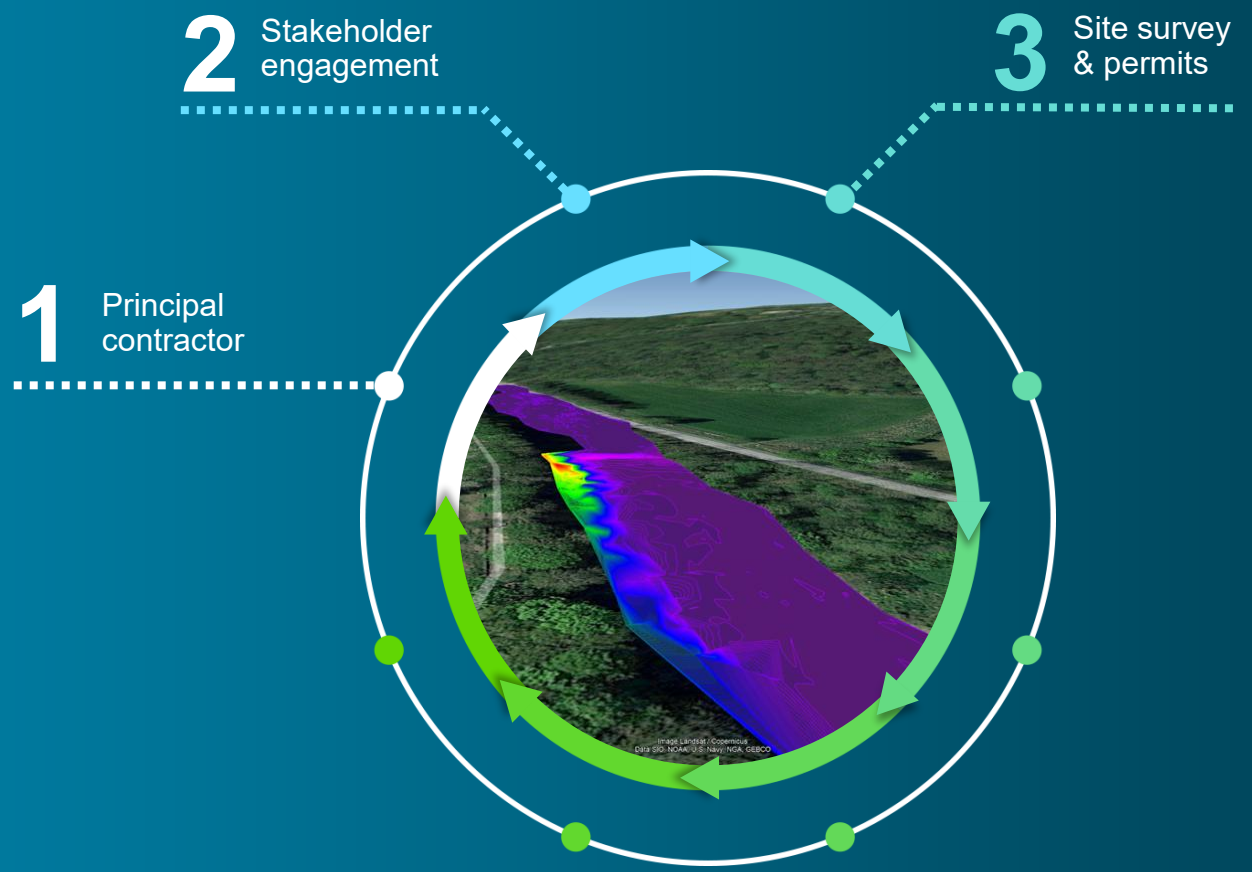
Boots on ground survey	Ecology survey	Mixing surveys
Site survey report	Drawings	Drone water quality surveys
Recommend solution	Permit applications	Drone flow surveys
Agree on outcomes with client	FRAP logging & notification	



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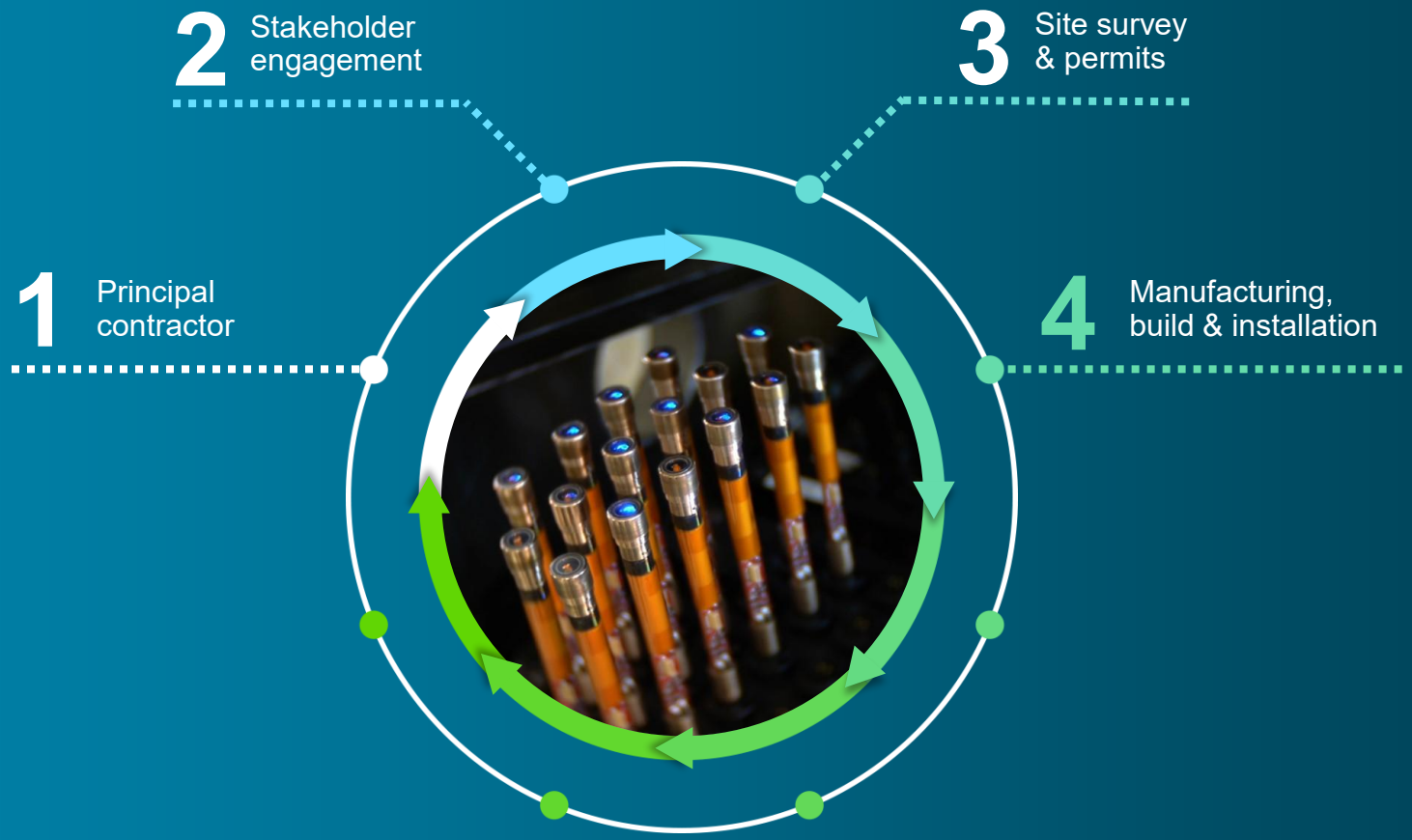
CDM principal contractor	CDM Principal designer
Site-specific RAMS	System design for installation
Project management	Monitoring hardware, telemetry
Field installation	Initial calibration, setup
Setup & commission	Transportation of materials to install team
Agree approval with client	



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Manage field service schedule

Swap in/out freshly calibrated sondes (with chain of custody)

Return sondes to Xylem for calibration

Provide routine maintenance

RAMS

Manage sonde calibrations to ISO17025 standard

Cleaning, post-calibration

Replace consumables (as needed)

Log calibration in LIMS system

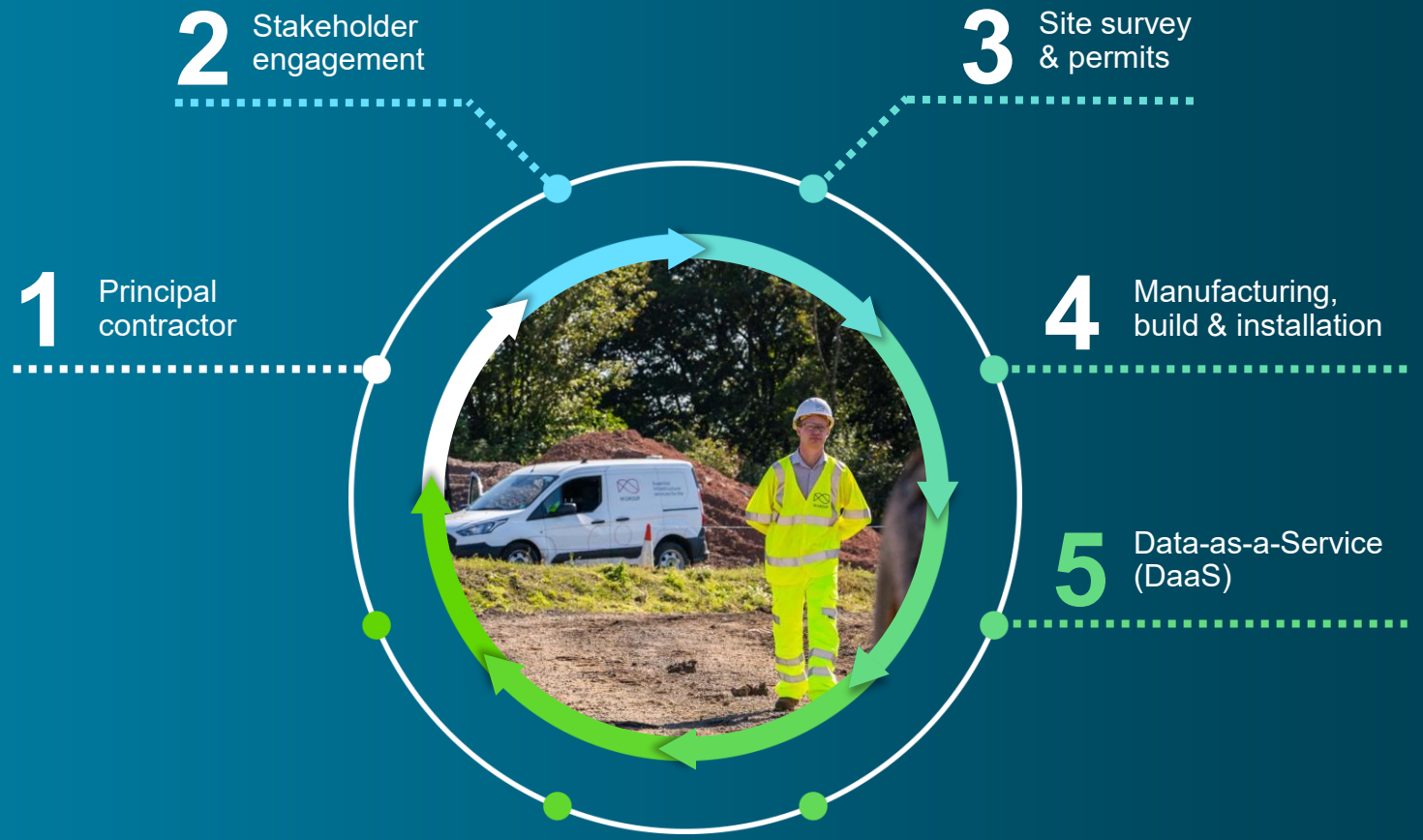
Return sondes to M Group

Initial comms setup of users, smart alarms, and dashboard

API and data visualization setup & maintenance

Monitoring of Alarms, daily QC checks

Customer check-ins



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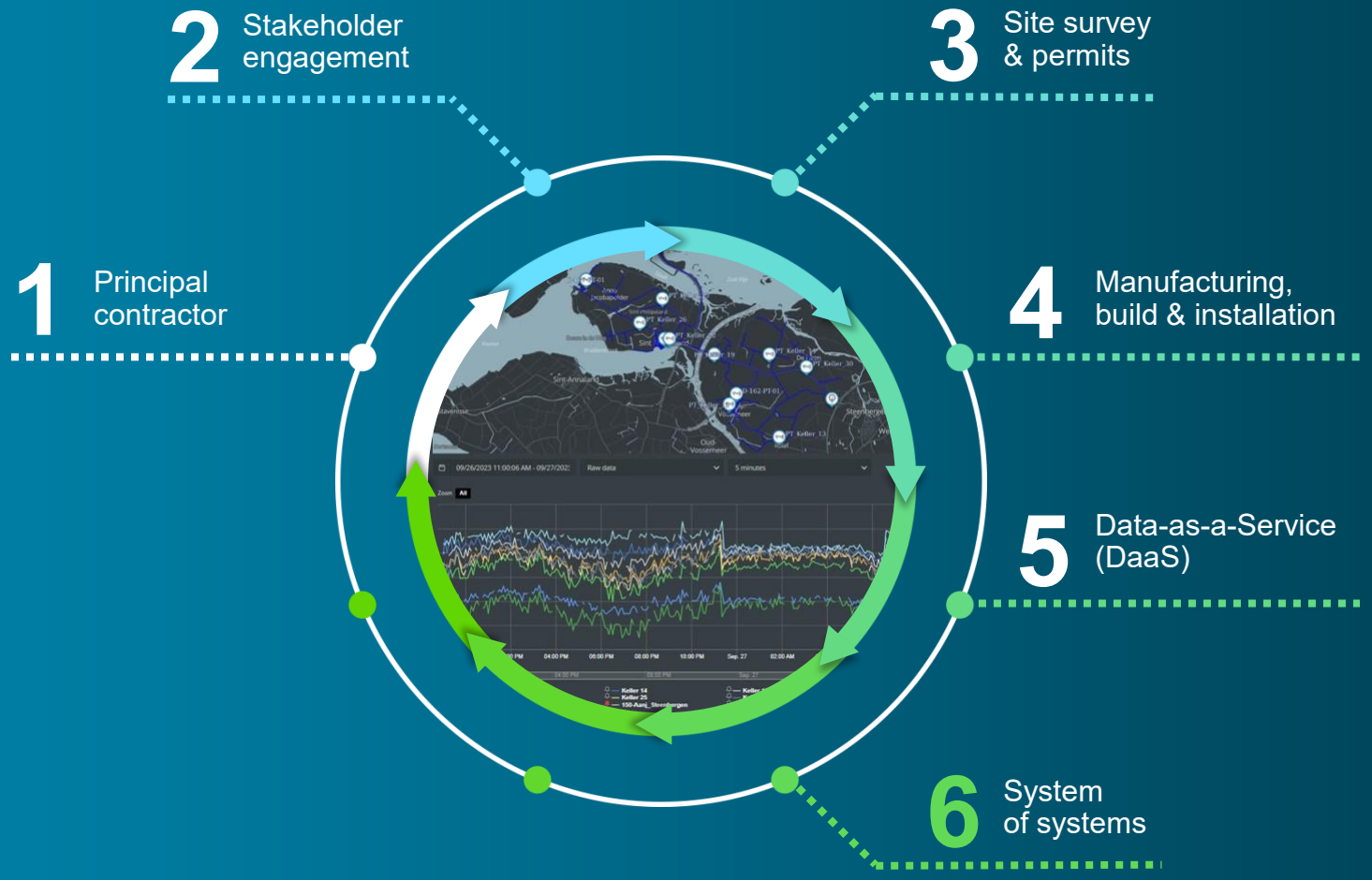
Various options for System of systems

- Digital twins
- Predictive analysis
- Decision intelligence
- Forecasting
- Control
- Virtual sensors
- Modelling
- Data science



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Data Analysis

Client Engagement

Stakeholder Engagement

Options

Recommendations

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Removal of monitoring equipment

Removal of systems (kiosks)

Recycling materials

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An unbeatable combination

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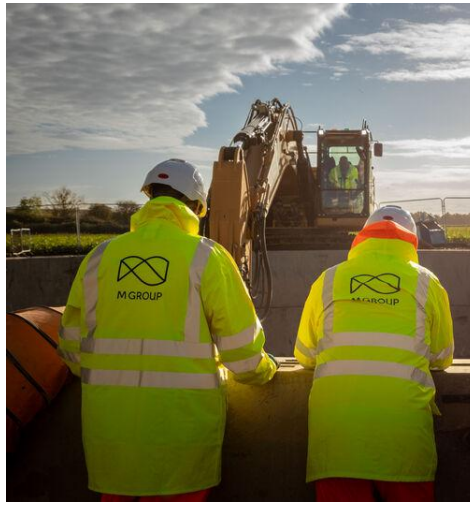
Trusted local partners



An extensive footprint in the UK

With a combined £17.5B in revenues, the consortium has extensive local support, including installation teams, engineers and management, with proven expertise in S82 delivery, ensuring compliance & reliability

A robust health & safety culture

Combined with CDM Principal Contractor expertise, ensures safe and compliant project execution

ISO9001, **ISO14001**, and **OHSAS18001** certifications—and our **Achilles UVBD** underpin our health & safety risk management efforts

With sustainability top of mind

Extensive experience in carbon emissions control, logistics, and sustainability models contributes to environmentally responsible solutions like concrete-free installations and a minimum-miles-driven optimised, electric vehicle fleet

Cost of a single installation

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Sonde only

Field-proven **YSI EXO2^{s} Sonde** as used by UK regulators measuring all Section 82 water quality parameters, connected to 3rd party device

Sonde & kiosk

Full CWQM station based on either **sonde in the water** or **sonde in pumped cabinet**. Including telemetry outstation and HydroSphere cloud connection

Installation

Installation under **CDM Principal Contractor** with fully trained installation team. Costs may vary depending on site specific requirements.

Data-as-a-Service

Choose between **HydroDaaS Silver** (client owns hardware and Xylem calibrates) or **HydroDaaS Gold** (full DaaS with client purchasing data only). Option of field swaps

System of systems

Data-informed insights drive automated control of actionable operation-led recommendations.

Integration of model with real-time data powered by **Xylem Vue**.

Scalable based on requirements

Optional services include landowner engagement, permits, site & ecology survey, mixing survey, sonde swaps, public data, stakeholder engagement, API and consultancy

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Planning & Access

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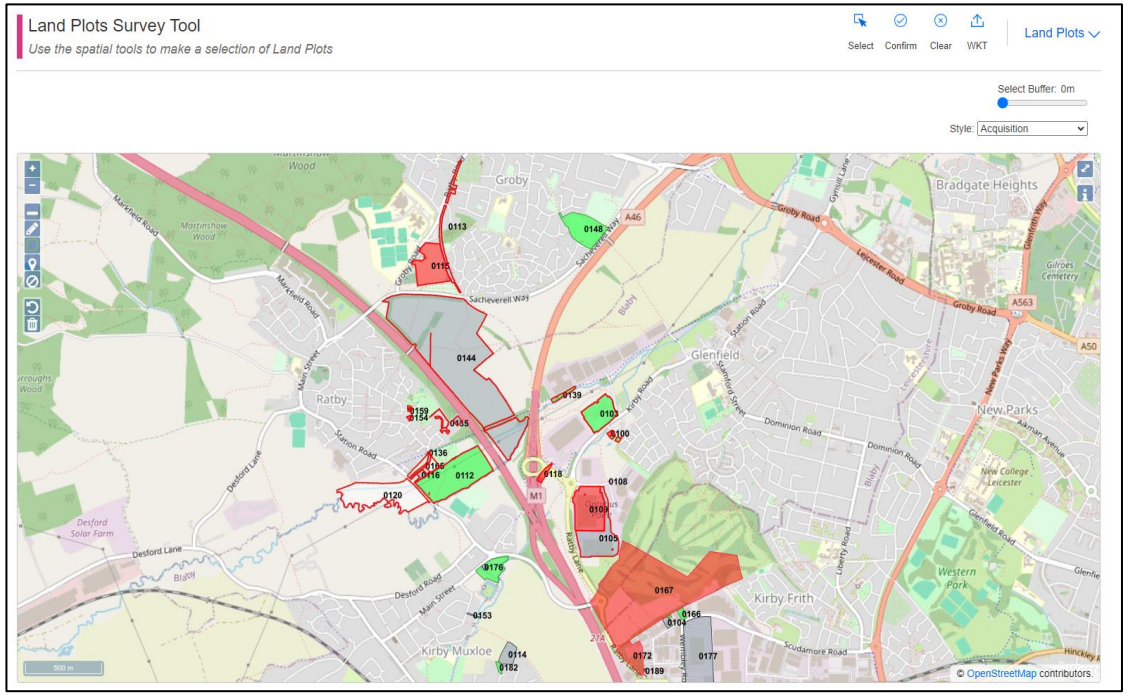
- Jacobs Track Record program
- Search area including areas for survey access
- Land constraints & opportunities – Special Category Land (National Trust, Crown Estate), Statutory Undertakers, Local Authorities
- Land Access – Refusals
- Land Acquisition & entry timeline for negotiation – realistic program
- Early Landowner Engagement – Build in time for engagement or time for consultation of design
- Compulsory Purchase timeline (if required)
- Landowner journey flow diagram
- Identify land & confirmation of design as early as possible
- Incentive payments for agreement – Applies to acquisition, can be applied to land access for intrusive survey

Example Surveys

- Otter Survey
- Mobile mapping in the field
- SPA ditch surveys
- Fish surveys
- Walkover
- Invasive Species



Engaging stakeholders

Section 82 compliance

Leading the way in **Section 82 compliance** & driving engagement and education across the UK.

- Landowners & farmers
- United Utilities
- Environment Agency
- Community Groups & Volunteers
- Natural England
- Local Councils
- Catchment Partnerships

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Continuous monitoring guidelines

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Interim Standard

- 25% of outfalls monitored, with further rollout planned
- Upstream and downstream monitoring
- Dissolved Oxygen, pH, ammonia, Turbidity
- One sample per hour or every 15 minutes during events
- Public data within 1 hour
- Site maintenance every 4 weeks
- Do not monitor if water is below 40 mm
- Preference for pumped kiosks (EXO Flow Cell)
- Monitor the impact (downstream mixed zone) and not the discharge/direct effluent

Data you can rely on

Section 82 compliance

The Environment Agency standard

YSI EXO Sondes are the UK standard for water quality monitoring—and working with the manufacturer comes with direct access to our experts

Measure the impact, not the effluent

Water quality and flow surveys via river drones ensure sondes are installed in locations that will measure the mixed effluent, not the concentrate

Traceable data integrity

Calibrations to manufacturers' standards, ensuring high-quality and reliable data to ISO17025, complete with clear chain of custody records and logged into a secure LIMS for traceability

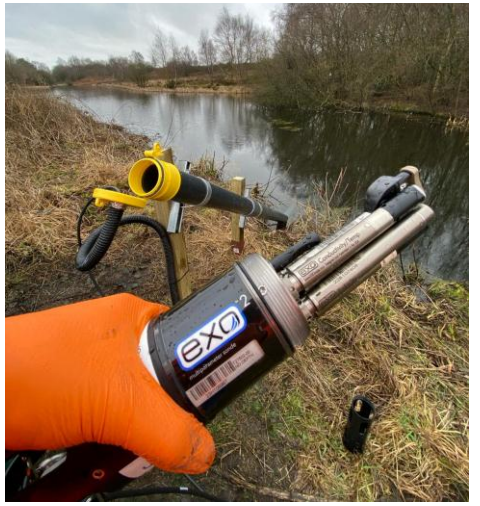
Never miss a measurement

Our adaptive power management system has been tested and characterized in Xylem's Cambridge R&D hub to ensure our systems collect data, even in challenging conditions

Industry-leading R&D

The consortium drives advances in water quality hardware, digital solutions, and software tools

Proven technology



Manufacturing lead-times

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Manufacturing
Xylem made multi-million-dollar investment to double manufacturing capacity of EXO Sondes creating world's most capable supply chain

Program of Works
M Group will work with United Utilities to manage the Program of Works. Sondes would be manufactured 2 months prior to need to reduce any risk of late delivery

Lead Times
Typical sonde lead-time is 2-3 weeks. Systems will be manufactured based on Program of Works with typical 6-week lead-time

Scalable Systems Builds
Modular solution built for scalability using common items including solar kiosk, which can be configured as either a pumped kiosk or sonde in water in minutes

No-concrete Design
The design of the monitoring stations removes repeat site visits for concrete pour and setting times. This increases efficiency for site installation

350x EXO2^{S} sondes and 2200 sensors delivered within 8 weeks for Section 82 monitoring in 2025

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Section 82 Monitoring Stations

Modular, Rugged, Reliable, Proven Solutions

In-Pipe

HydroRIG kiosk-free, battery solution with sonde and telemetry system within tube. Ideal for applications with data transmissions **>1hr and sites which do not flood** (telemetry underwater)

EXO in sonde tube

Suitcase

HydroRIG-P solar solution mounted on wall, pole or in a kiosk. Real-time data with smart alarms.

Portable 'suitcase style' can be used as a semi-permanent option

EXO in sonde tube

Kiosk

HydroRIG-K offers additional protection with **small footprint kiosk (0.5 m^2), zero concrete build (for sensitive habitats) and vandal resistant** solar panel to mount HydroRIG-P solution.

EXO in sonde tube with depth sensor (<40 mm)

Lamp Post

HydroRIG-L is great for use in **flood plains.** Equipment mounted out of reach to **reduce vandalism** issues whilst easy to service.

Available in 2-5 m lengths

EXO in sonde tube

Pumped

HydroRIG-PK is ideal for **shallow water** or applications where distance from bank to water exceed typical pipe installation **(steep banks – avoiding potential H&S issues).**

EXO in flowcell

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EXO Ammonium / Ammonia

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Designed for fresh water

Ion-Selective Electrode designed for freshwater applications with best sensitivity **< 2 mg/L** NH4+ -N

Measures Ammonium, calculates Ammonia

With the pH of final effluent or CSO being typically less than 9.25, the majority of ammonia in rivers is in the form of Ammonium. Sensor measures ammonium and calculates ammonia based on pH & temperature. Measuring ammonia only as unionized ammonia would not indicate source of ammonia in river due to pH.

Accuracy

Typical accuracy is **+/- 0.5 mg/L** NH4+ -N, within a range of 0 to 2 mg/L NH4-N. Site with higher sodium or potassium levels, may see higher inaccuracies

Virtual Ammonium

Cloud provides six outputs for ammonia. These are raw Ammonium / Ammonia, local Ammonium / Ammonia and virtual Ammonium / Ammonia. Virtual Ammonium is very powerful to understand both drift and interference

Environment Agency-Approved

Tested for many years by the Environment Agency National Water Quality Instrumentation Service (NWQIS) with thousands of deployments

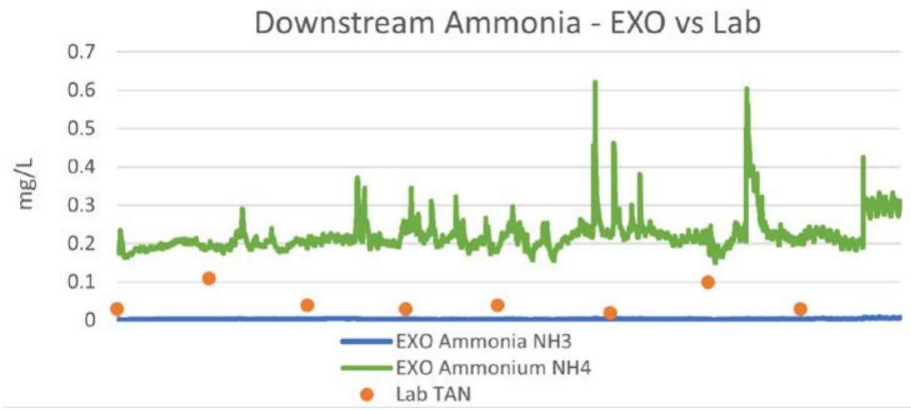

Figure 5. EXO ammonium and ammonia concentrations with lab-determined Total Ammonia Nitrogen (TAN) at the downstream site.

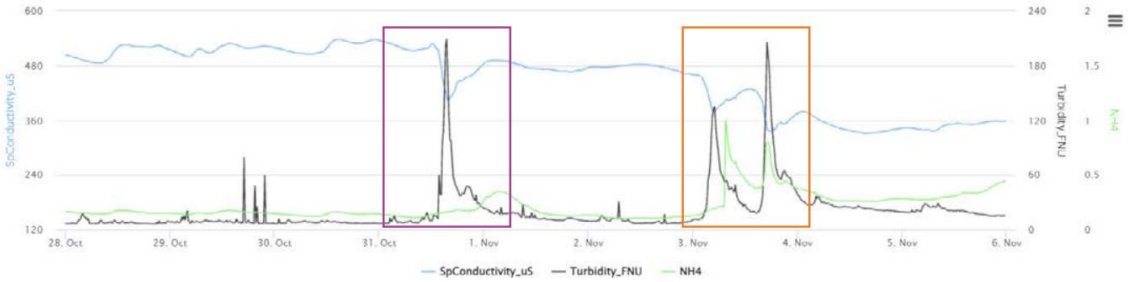

Figure 8. Downstream site live EXO sensor data excerpt from HydroSphere. Rain events during which a sewage overflow discharge demonstrated higher increases in ammonium.

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Process map for collaborative site management

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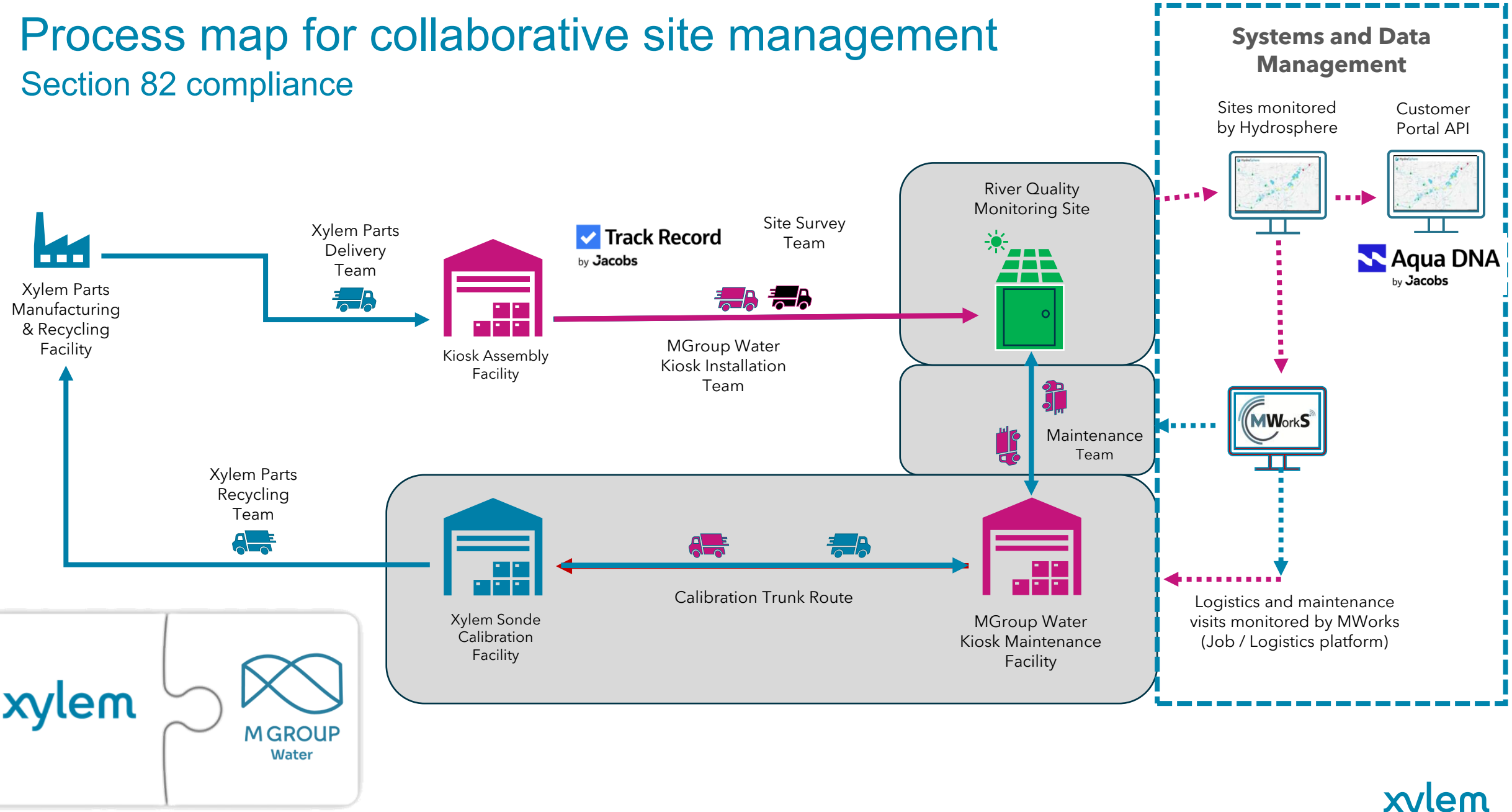

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Calibration & Maintenance

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Lab vs Field Calibration

Recommend calibration in a controlled laboratory with field swap outs to ensure traceable calibrations, condition the electrodes and eliminate contamination due to dirty instruments

Frequency

DEFRA guidelines state once every 4 weeks. This is expected to move to 8 weeks with proof of data from S82 trials

Battery Life

Battery-only systems require replacement approx. every 6 weeks. Recommend collecting and transmitting data every 15 minutes with vandal / theft -esistant solar solution. Typical battery life for solar system 5 years

Specification

All specifications meet or exceed DEFRA Technical Guidelines

Equipment Certification

YSI EXO sonde is Environment Agency-approved and is currently undergoing MCERTS approval

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HydroSphere | Intelligent Maps with Smart Alarms

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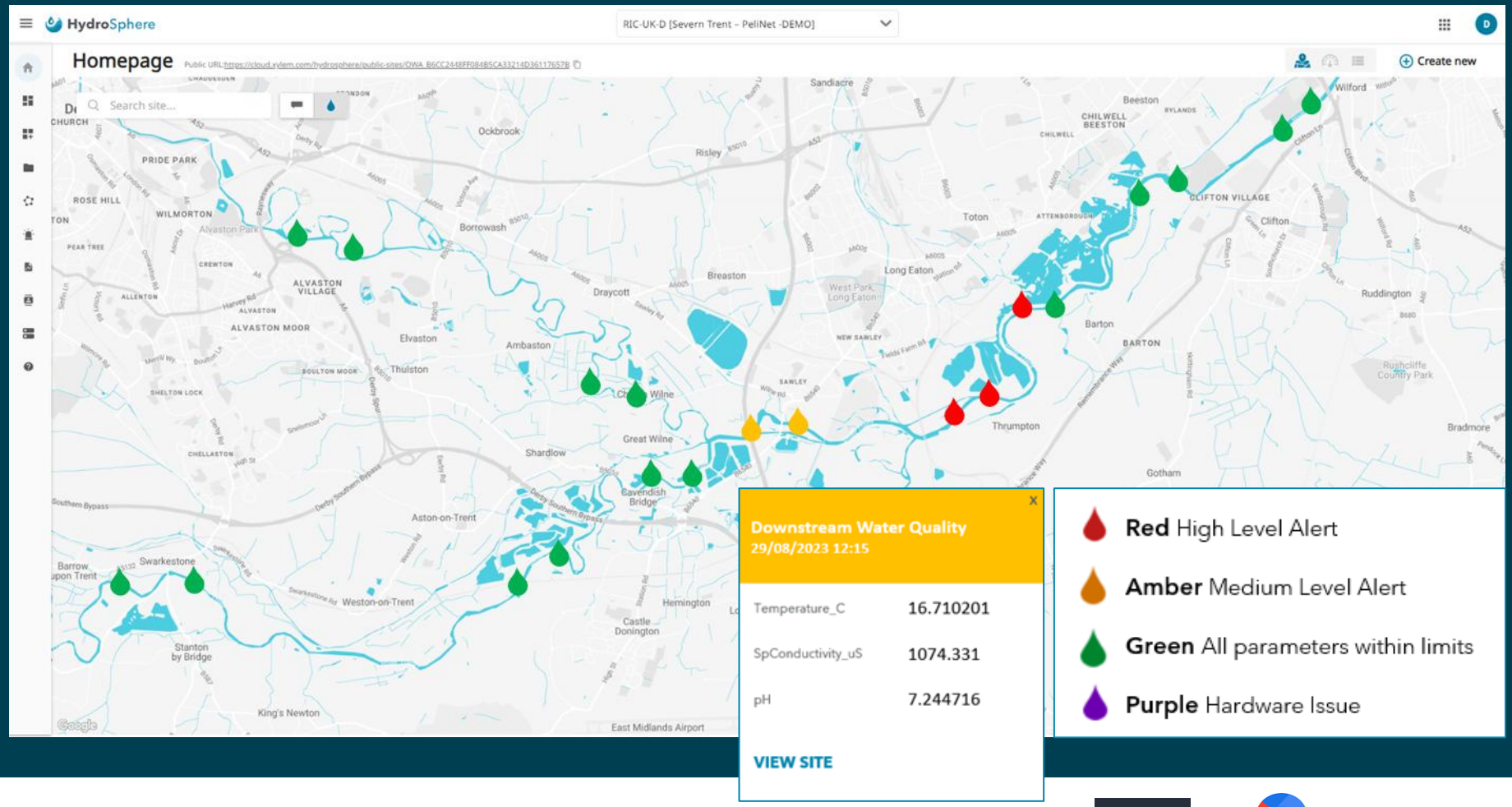

Turning Data into Insights

With potentially **thousands of monitoring stations** active in the field, it would take an army of people to daily view and interpret the data for every site.

HydroSphere can process thousands of data points against norms to provide **simple map visualization** with alarms.

Partner API output as standard for smooth system integration into SCADA

Powered by AWS

aws

Google Maps

Aqua DNA by Jacobs

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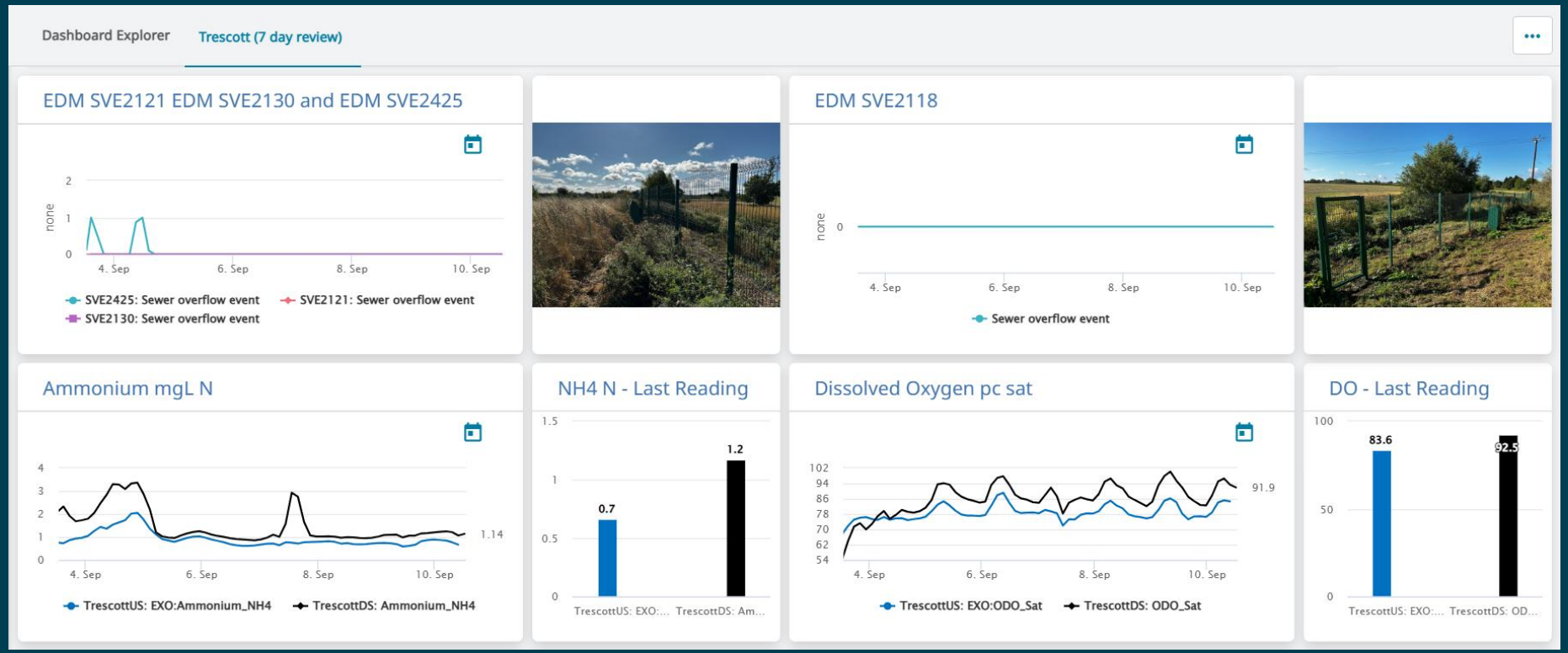
HydroSphere | Data Dashboards

Section 82 compliance



Turning Data into Insights

Custom Data Dashboards pair EXO **water quality** data with site **photos**, live **EDM alarms**, and public source **map data**.

API's can not only be used to port data out of HydroSphere, but also to **incorporate data from SCADA** systems and **public portals** for enhanced site visibility.

Powered by AWS

Google Maps

Aqua DNA by Jacobs

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HydroSphere | Data Dashboards

Section 82 compliance

Turning Data into Insights

Custom Data Dashboards pair EXO **water quality** data with site **photos**, live **EDM alarms**, and public source **map data**.

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Powered by AWS

Google Maps

Aqua DNA by Jacobs

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Cybersecurity & Partner API

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All services are designed, developed, and operated in line with Xylem Cybersecurity standards.

Telemetry

- Secure telemetry from YSI EXO2S sensors via HydroRIG gateway to Xylem Cloud
- Encryption in transit and at rest

Trusted Partners and Processes

- Certified infrastructure, tools, and data centres aligned with ISO 27001, SOC 2 and other applicable standards
- Secure software development process guided by IEC 62443

Data Access

- OAuth 2.0 authentication and authorisation for all customer data access
- Role- and customer-based access control

Partner API

- Secure delivery of structured JSON data from Xylem Cloud to AquaDNA
- Access controlled via customer-specific OAuth credentials

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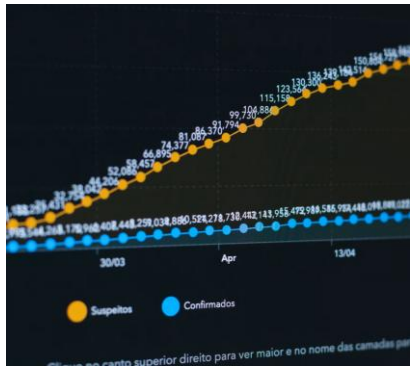
Continued innovation

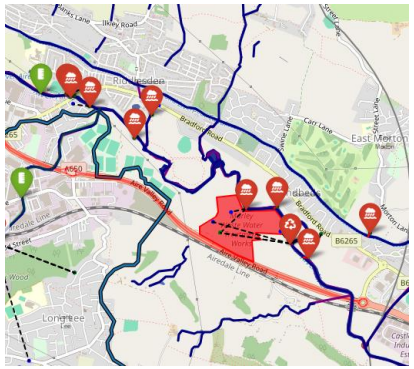
Section 82 compliance



Optical ammonia / virtual sensing

Infer ammonia levels from other WQ parameters. Use to flag drift and estimate baseline ammonium as a proxy measurement.

- Wider applicability of proxy sensing for **detecting anomalous events**



Further enhanced GIS and modelling

Use data science techniques to collate **relevant GIS data for a given catchment**, putting resources and custom maps at your fingertips for efficient program planning.

- Optimization of monitor placement and **clustering**

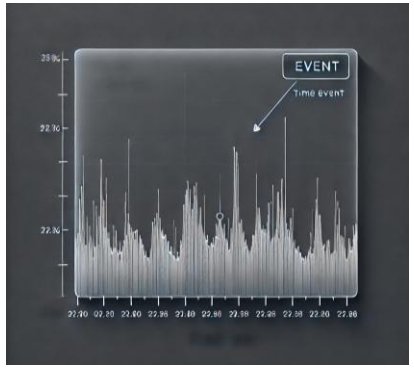
Additional enhancements for sondes

Widen the suite of sonde sensors compatible with the EXO2 to include 3rd party sensors for **tryptophan, hydrocarbons,** etc.

- Enable the detection and localization of a wider pollutant set **to better determine event sources**

Continued innovation

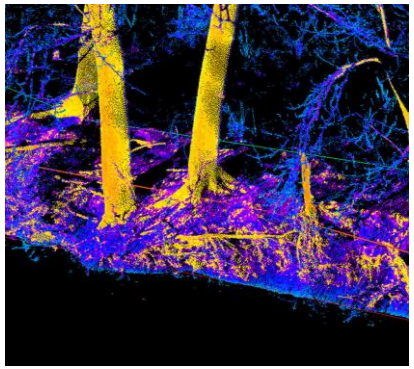
Section 82 compliance



AI/ML event detection and classification

Implement algorithms to **detect and label rainfall, spill, recalibration and other events** from data in HydroSphere.

- Continue integration with GIS platform to estimate time **& location of pollution event origins.**



3D site survey / augmented reality technology

Use LIDAR / photogrammetry to create **3D models of planned deployment sites** and monitor deployment arrangement.

- Create and distribute 3D rendering of site plan, enabling clients to **visualise** and review how **deployments are implemented.**

Complement monitoring with remote sensing

Combine sonde and spatial data to provide more insight into your waterways.

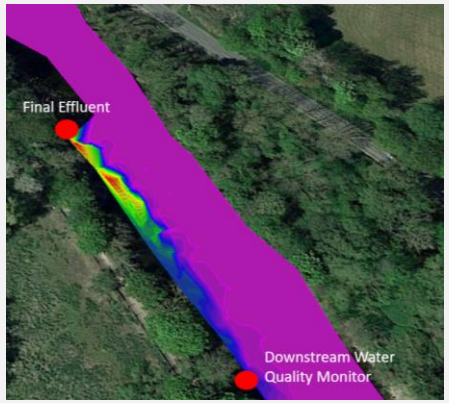
- Monitor data derived from satellite-based sensors for parameters such as turbidity, chlorophyll a, surface water temperature, and potential HABs **from any web connected-device**.

Spatial surveys with Surfbee

Section 82 compliance

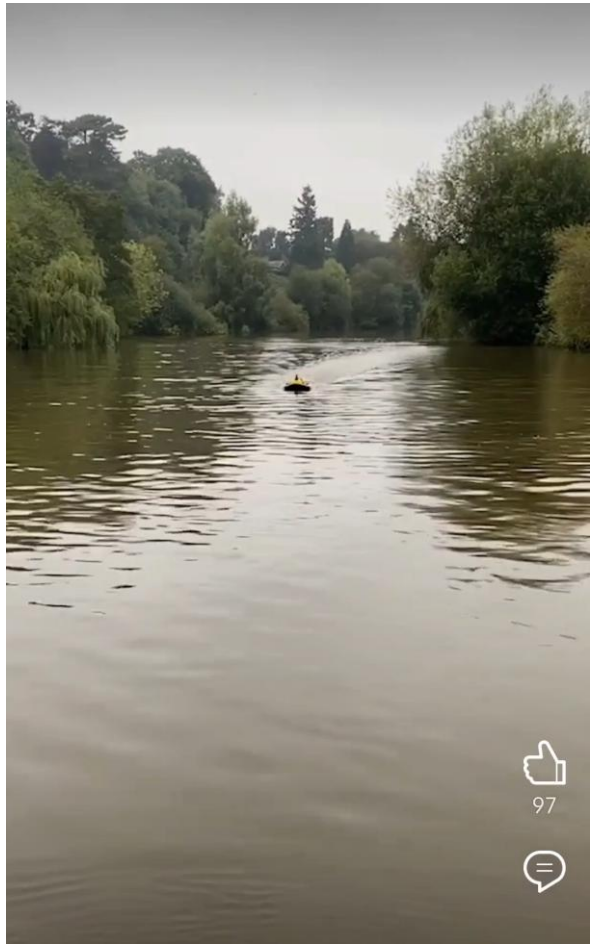
Map flow and water quality for additional insights

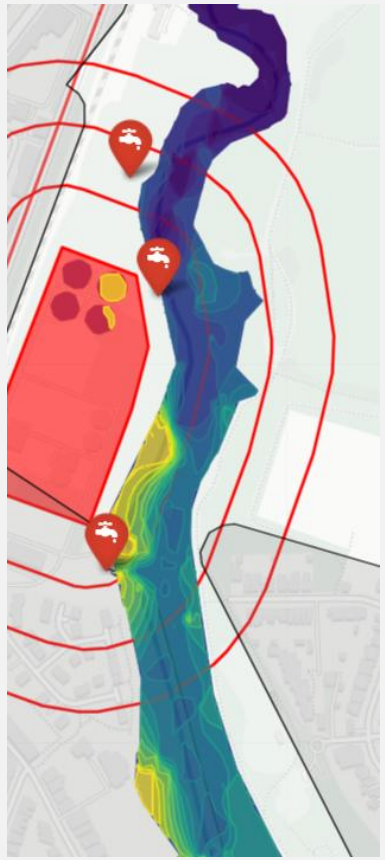
- Autonomous or remote controlled
- Waypoint mission planning
- Mixing studies, environmental investigations
- Ensure correct monitor placement by mapping mixing and dilution
- Identify hot spots
- Use onboard camera to inspect hard-to-reach asset conditions
- Loiter mode for ease of handling and to highlight correct positioning for WQ buoys and profilers



Ensure measurement takes place in the right place

Final effluent here has disproportionate effect on monitor





Ammonia survey shows tidal backwash of final effluent

Survey data integrates with Hydrosphere GIS for context

Android-based remote control

3 models to support variety of Xylem water quality and hydrometric measurement

An unbeatable combination

Section 82 compliance

Scalable solutions

A tailored compliance solution

We offer a flexible ladder of delivery services with proven systems integration at scale. From pumped kiosks to in-vivo measurements, we tailor a solution to your requirements

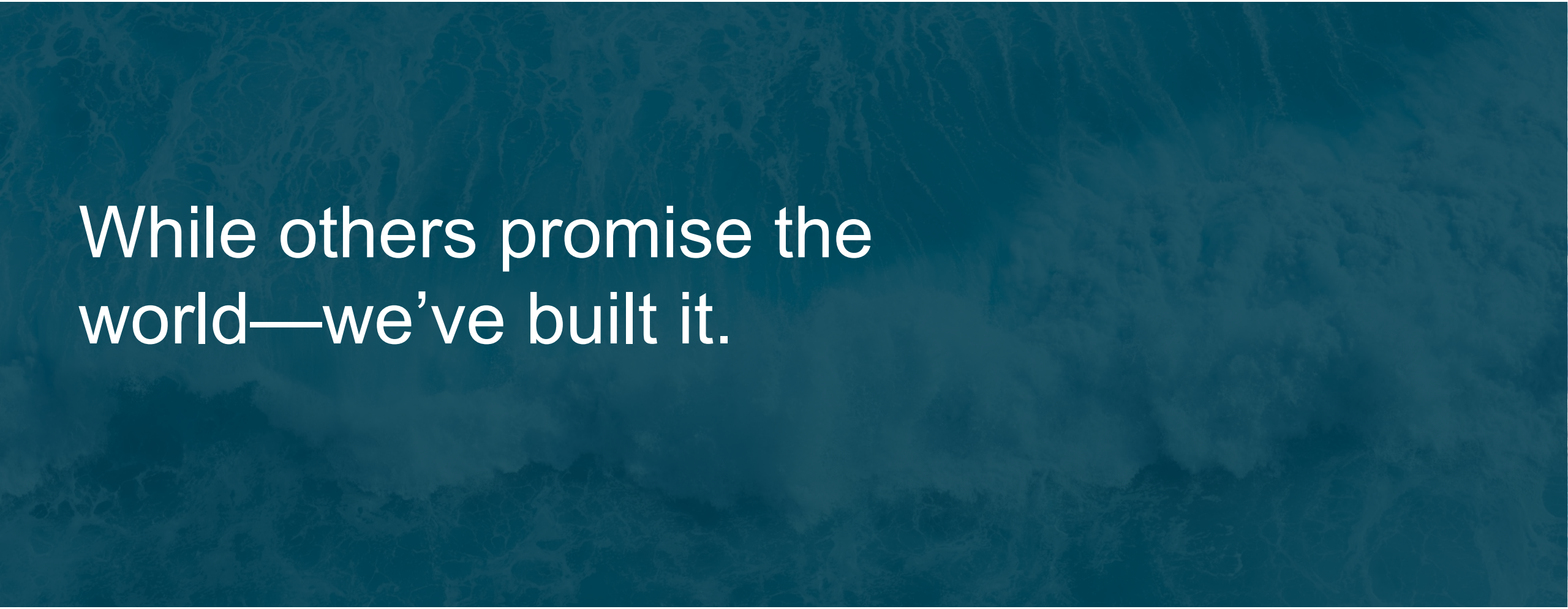
A full range of options

The deployed solution can be scaled from hardware and design to a completely managed end-to-end **Data as a Service** at fixed costs

Ready to scale

Streamlined survey, deployment, and commissioning processes allow for rapid and sustainable scale-up of your monitoring efforts from just a few stations to thousands

Our investment in modular hardware design and manufacturing provides you with the sector's most capable and resilient supply chain to support your compliance efforts


While others promise the
world—we've built it.

Wessex Water pilot

Section 82 compliance

Under contract to install and maintain
17 monitoring stations in 2025

If successful, scale to up to 500 sites across the region over a 5-year period

Challenge

Implement water quality monitoring in the most difficult scenarios the utility faces – those in high traffic locations, areas with limited sunlight, or limited access to a safe riverbank

E.g., urban areas, converging tributaries, floodplains & more

Solution

Installed end-to-end solution with a full range of YSI EXO multiparameter sondes connected to Wessex Water systems via real-time API.

Additional services included spatial water quality surveys using river drones to better understand mixing.

Includes ongoing field maintenance and calibration to ISO17025 standards

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Severn Trent river monitoring

Section 82 compliance

Under contract to install and maintain
90 monitoring stations over 12 months

If successful, scale to up to 1,000 sites across the region over a 5-year period

Challenge

Implement water quality monitoring in the most difficult scenarios the utility faces – those in high traffic locations, areas with limited sunlight, or limited access to a safe riverbank

E.g., urban areas, converging tributaries, floodplains & more

Solution

Installed end-to-end solution with a full range of installations of YSI EXO multiparameter sondes connected to telemetry, complete with a full data-as-a-service setup

Includes ongoing field maintenance, and calibration to ISO17025 standards

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What drove success with Section 82?

Lessons to become local leaders

Trusted Partners
The consortium includes framework partners with proven expertise in S82 delivery, ensuring compliance & reliability

Proven Technology
Manufacturer of YSI EXO sondes, used as standard by Environment Agency guarantees accuracy and reliability

Scalable Solutions
Investment in modular design and manufacturing to provide sectors most capable supply chain

Innovation
The consortium provides industry-leading research and development, advancing water quality hardware, digital solutions, and software

Data as a Service
Flexible DaaS offering including capital and full DaaS options at fixed costs. Stable $6B corporation

Flexible Delivery
A flexible suite of delivery services with proven systems integration at scale ensures tailored solutions for diverse project needs

Safety Culture
A robust health & safety workplace culture, combined with CDM Principal Contractor expertise, ensures safe and compliant project execution

Data Integrity & Security
Traceable calibrations, sensors, and standards, ensuring high-quality and reliable data
Highly secure protocols, APIs for data access

Sustainability
Extensive experience in carbon emissions control, logistics, and sustainability models contributes to environmentally responsible solutions. Concrete -ree installations

Local
Large footprint in North West, including installation teams, engineers, and management working with local stakeholders

Proven Sensor Manufacturer | Leading Services Provider | Global Consulting

Take-home tips

Lessons to become local leaders

Know your strengths

You need support to cover the full spectrum. Build a team for an end-to-end, scalable solution

Explore telemetry

Satellites (Iridium paired with Campbell logger) are a reliable alternative to cellular at remote sites

Identify opportunities

CSOs are a global issue. Small systems that lack alarms and may be releasing sewage during storm events. Utilize **EXO Ammonium ISE**

Discover AI tools

Use AI to search for public source data, identify stakeholders, find relevant studies, and more

Rapid-deploy

It is faster, easier, cheaper to set up a **HydroRIG+** and **EXO2^{S}** to monitor than an entire SCADA infrastructure

Harness HydroSphere

Features developed by Xylem UK and API's make **HydroSphere** great for CSO monitoring and visualization

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Our impact across the globe

World Bank projects

Tackling the biggest water challenges

Projects that address our world's most pressing issues

Combating water scarcity

Securing reliable water access amid growing demand and water insecurity.

Building resilience

Adapting our communities to withstand floods, droughts, and climate-related disruptions.

Protecting water quality

Safeguarding our water from pollution, contamination, and ecosystem degradation.

Enhancing management capacity

Improving data, infrastructure, and decision-making to optimize water use and distribution.

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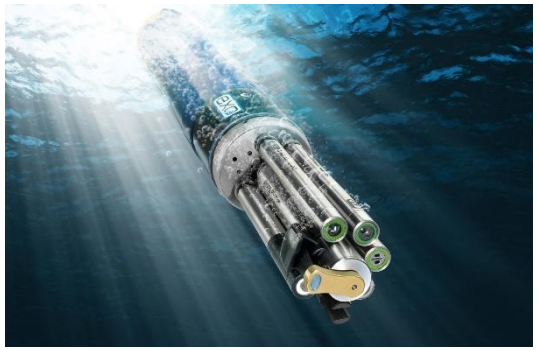
Combating water scarcity

Ministry of Agrarian Development & Irrigation, Peru



Challenges

- Water insecurity limited community growth
- Poor water quality due to untreated municipal/industrial wastewater discharges

Solution

- Installed real-time stations across major watersheds
  - **EXO Sondes** for water quality
  - **Amazon bubblers** for water level
- Identified overuse and pollution sources

Case study: Utilities & communities

Peru

Outcomes

IMPROVED
WATER GOVERNANCE

78 Hydrometeorological stations

88% of those surveyed believed conflicts related to water distribution were reduced as a result of the project[1]

[1] World Bank, Implementation Completion and Results Report

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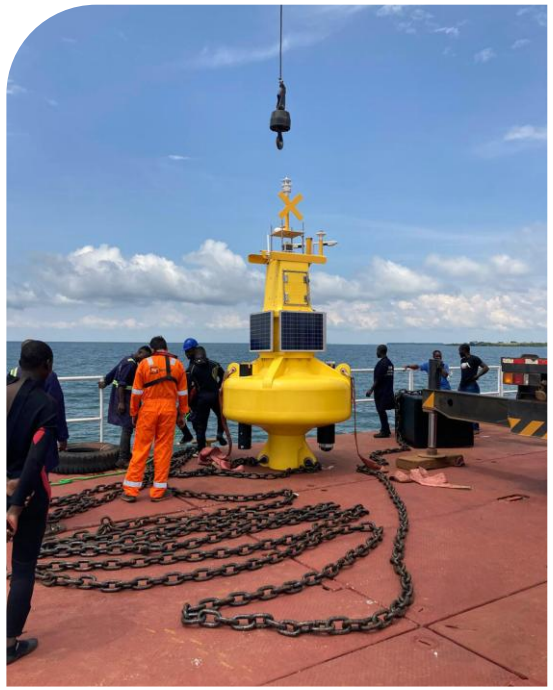
Building resilience

Multinational Lake Victoria Maritime Communication & Transport Project



Challenges

- Improve navigational safety on African Great Lakes
- Strengthen maritime industries

Solution

- Installed 9 real-time **MOTUS** wave and meteorology **monitoring buoys** in Lake Victoria
- Data informed efforts to manage marine traffic, reduce accidents, and save lives

Case study: Utilities & communities

Lake Victoria, Africa

Outcomes

ENHANCED

MARITIME SAFETY

for the fleet of >70,000 vessels that travel Lake Victoria each year

4,000 lives saved annually due to marine accidents

$2M saved annually from successful search and rescue missions, salvaging 300-400 vessels[1]

[1] African Development Fund, Project Appraisal Report

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Building resilience

The Center for Hydrometeorological Service, Uzbekistan

Challenge

- Establish an early warning system for hazards such as floods, mudslides, and drought

Solution

- **SonTek-S5, M9, and RS5** ADCPs to measure water velocity in rivers and canals
- Data helps develop new forecasting methods to save lives and prevent property loss

Case study: Utilities & communities

Tashkent, Uzbekistan

Outcomes

INCREASED

DISASTER PREPAREDNESS

estimated economic impact >$236M for flooding alone[1]

11M citizens in high-risk areas benefit from enhanced efficiency and coverage from warning systems[2]

50% reduction in flood warning time, saving lives and delivering a >3% reduction in property damage[2]

[1] UNDP, Enhancing Multi-Hazard Early Warning System
[2] UNDP, ProDOC of Multi-Hazard Project

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Protecting water quality

Gujarat Ecology Commission (GEC), Shivrajpur Beach, India

Challenges

- Earn a Blue Flag accreditation for Shivrajpur Beach, an honor for the highest-quality beaches in the world
- Establish a water quality monitoring program

Solution

- YSI buoy for long-term water quality monitoring
  - **EXO2 Sonde**
- HydroSphere data visualization platform to view and share real-time data to promote and protect the beach

Case study: Utilities & communities

Shivrajpur, India

Outcomes

ECONOMIC

GROWTH & INVESTMENT

Blue Flag certification led to $13M in infrastructure to promote tourism

"Proud moment for India; all 8 beaches recommended by the government (including Shivrajpur) get coveted International #BlueFlag Certification. The #BlueFlag certifications were accorded to India by an international jury and are also global recognition of India's conservation and sustainable development efforts."

Shri Prakash Javadekar (via X)
Former Union Minister of Environment, Forest and Climate Change

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Enhancing management capacity

Central Water Commission of India, State Water Agencies

Challenges

- Increasing water demand across India
- Lack of data to make decisions
- Improve the extent, quality, and accessibility of water resources information

Solution

- **SonTek-M9, RS5, SL, and FlowTracker** instruments to measure water velocity, flow, level, and discharge data nationwide

Case study: Utilities & communities

India, Nationwide

Outcomes

IMPROVED

OPERATIONS & PLANNING

by measuring and modeling water quantity for planning, reservoir operations, and flood management

250+ SonTek instruments were deployed throughout India

3 Advanced flood forecasting systems developed for river basins across the country, with more to come[1]

[1] World Bank, National Hydrology Project

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Thank you

Xylem International Dealer Meeting
New Orleans, LA

October 6-8 2025