

Smart Water

Intelligent solutions
for the entire water chain



Opportunities and Power with Big Data

It is the right of every human being to have access to sufficient water for personal and domestic uses, which must be safe, acceptable, affordable, and physically accessible. But the world is facing an increasing water scarcity. Water management is not only an operational matter of running infrastructure. It is more and more about optimal use of assets in the water network. About efficient Information Technology, monitoring and optimization processes, system analysis and integration, smart solutions and big data management.

The Global water sector manages many valuable assets. The amount of data and information generated around and from the different assets water companies manage is rapidly increasing.

Putting this big data to good use is an essential precondition for modern asset management, not only from the perspective of investments, but also from the perspective of the day-to-day operation of the water supply systems: smart data management to enable these systems to function optimally.

Royal HaskoningDHV offers a range of smart automation solutions and concepts to help you operate these systems efficiently. Our solutions in the field of Advanced Control, KPI dashboards and Central Control Rooms will give you more control over the performance of your water systems. You will be better equipped during the day-to-day operation to maximise the potential of your systems.

The Dutch water sector, for example, manages the following assets:

220

drinking water production locations

115.000

kilometres of drinking water pipelines

16.000

waste water pumping stations

120.000

kilometres of waste water pipelines

345

wastewater treatment plants

80

sludge treatment plants

4500

drainage pumping stations

1.250.000

I/Os

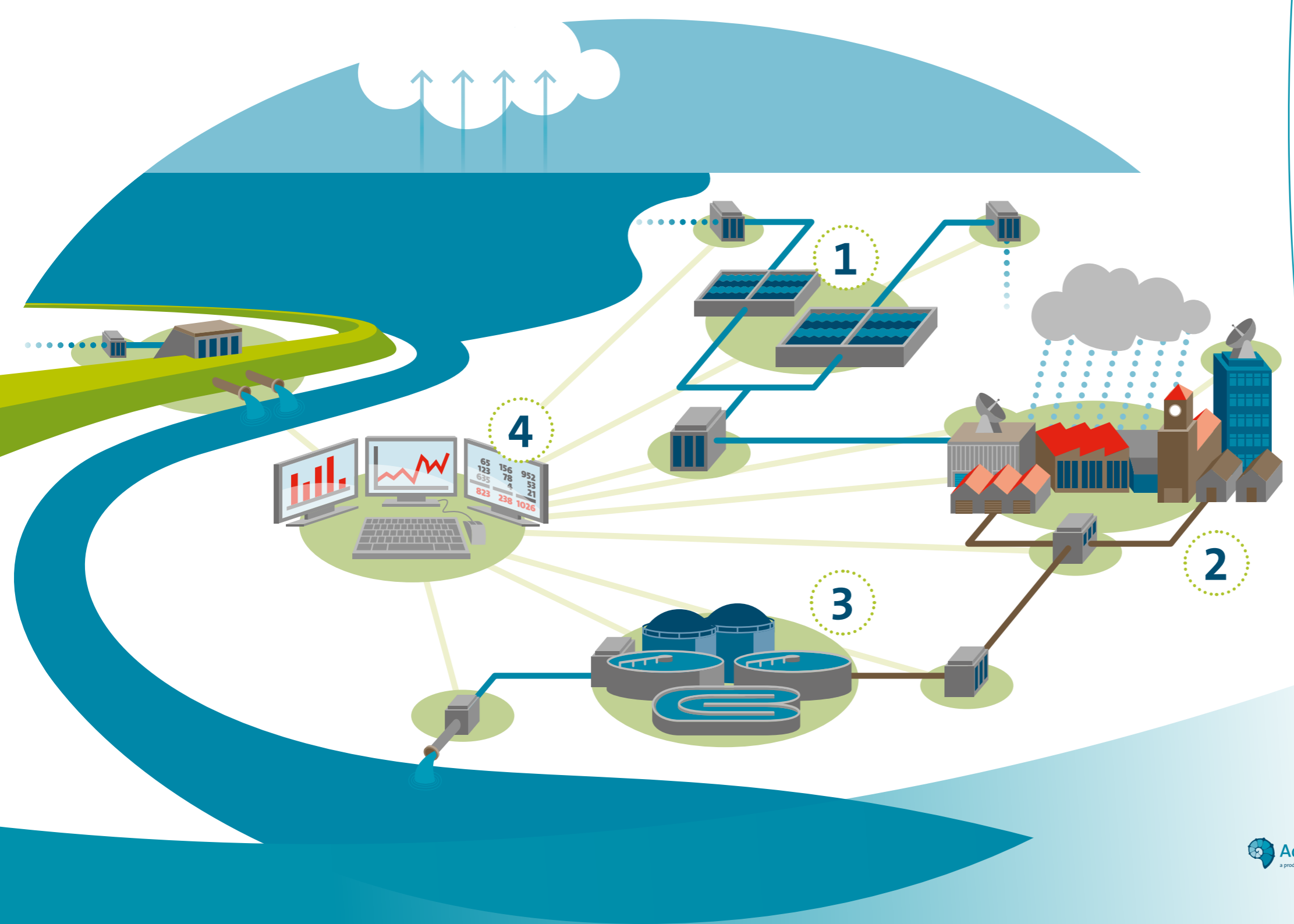
INTELLIGENT SOLUTIONS FOR THE ENTIRE WATER CHAIN

PRODUCTS AND SERVICES

- 1 - AQUASUITE® OPIR
- CRYSTALACTOR CONTROLLER
- 2 - AQUASUITE® FLOW
- 3 - AQUASUITE® PURE
- AQUASUITE® MINE
- NEREDA® CONTROLLER
- 4 - CENTRAL CONTROL ROOM
- ASSET INFORMATION MANAGEMENT
- COMMUNITY PLATFORM

OUR ADDED VALUE

Royal HaskoningDHV bridges the gap between genuine water knowledge and specific ICT expertise. We support the water sector at all levels: strategically (data and information planning), tactically (project definitions) and operationally (management and maintenance). Aquasuite® is the ultimate monitoring & control software platform for the water sector that combines supply and demand prediction software with smart controls powerfully and reliably. This robust and proven platform with over a hundred connected water systems around the world is modular and flexible and has a user-friendly web interface. Aquasuite® has interfaces with virtually all Scada, PLC and process databases in the water market.



Aquasuite[®] OPIR accurately predicts the drinking water consumption every quarter of an hour for the upcoming 48 hours. The control functions in OPIR use this information to optimise control of the volume and pressure in the entire water supply system. The result is a stable and efficient process performance, optimal water quality, and minimal energy consumption.

OPIR not only predicts the water consumption in the specific regions, but also the pressure and distribution flow of water treatment plants and pumping stations, and all levels of reservoirs and water storage tanks.

OPIR's consumption prediction is adaptive and self-learning. OPIR automatically learns the consumption patterns and water consumption factors and applies these to the prediction.

OPIR monitors the performance of the predictive and control modules, as well as the energy efficiency of the drinking water system.

OPIR monitors whether the drinking water system is behaving 'normally'. In the event of deviating behaviour (such as a pipe burst) OPIR warns the water company.

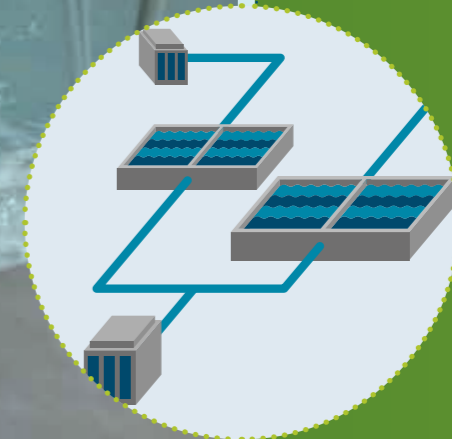


THE RESULT

- OPIR saves on energy by 5-10%.
- OPIR reduces turbidity by 12-20%.
- OPIR reduces 50-80% of the process switching, resulting in less wear and malfunctions.
- OPIR predictive control means a reduction in process monitoring by operators.

CHARACTERISTICS

- OPIR improves insight into your overall water balance.
- OPIR can be used for small to large water systems.
- OPIR is low-maintenance because of adaptive functionalities.
- OPIR provides stable and efficient operations.



Aquasuite® FLOW translates real-time data from sewage pumping stations into valuable insight into the actual performance of your entire wastewater transport systems.

Transport systems are designed and built based on theoretical foundations. In practice, often little is known about the actual function of the applied system. However, the majority of modern sewage pumping stations generate a large number of measurement signals.

Aquasuite® FLOW uses this wealth of measurement data by combining the individual measurement signals with meaningful performance indicators that help you understand how your transport system really operates. With these insights, you can make better decisions about, for example, necessary maintenance and modifications to improve the functioning of the system, such as adjusting the inflow level or optimising pump circuits.

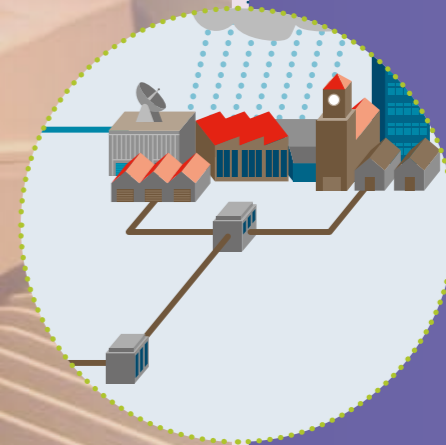


THE RESULT

- FLOW provides insight into the actual dry weather discharge characteristics of the system (averages, peaks, trends).
- FLOW provides insight into foreign sewer water issues.
- FLOW helps prevent unnecessary investments in new construction or renovation projects.
- FLOW generates predictive maintenance information.
- FLOW provides insight into the pump efficiency.
- FLOW thereby provides information for optimising energy consumption.

CHARACTERISTICS

- FLOW can be quickly designed for your transport system via parameterisation.
- FLOW is easy to connect to the main station or the Scada in which the measuring signals of pumping stations are collected.
- FLOW shows meaningful performance indicators for end users through intuitive user screens.



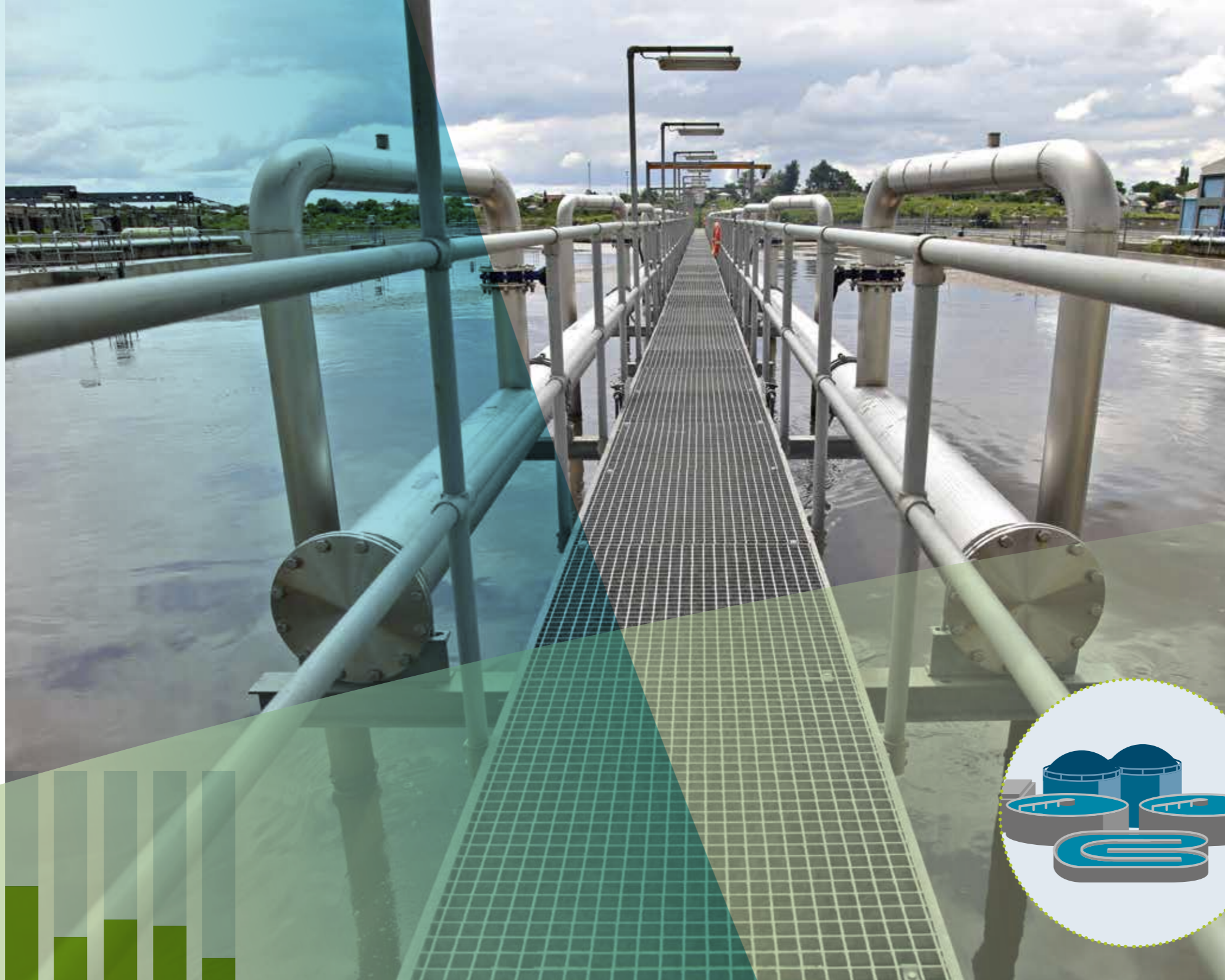


Aquasuite® PURE is an advanced system for optimising nutrient removal and the energy and chemical use of your treatment process.

The amount of energy and chemicals that are required to achieve the desired effluent quality will depend on the quantity and composition of the inflow of wastewater at your treatment plant.

PURE learns the daily patterns of this inflow. Prediction of precipitation and storm water flow detection are used to include the flow of storm water. Thanks to this prediction, PURE controls the aerators, pumps and valves of your treatment system in the best way possible. This ensures a stable operation, excellent effluent quality and a low energy and chemical use.

Using smart Dashboards, PURE subsequently provides insight into the performance of your treatment process and controls. Your treatment process is thus further monitored and optimised.

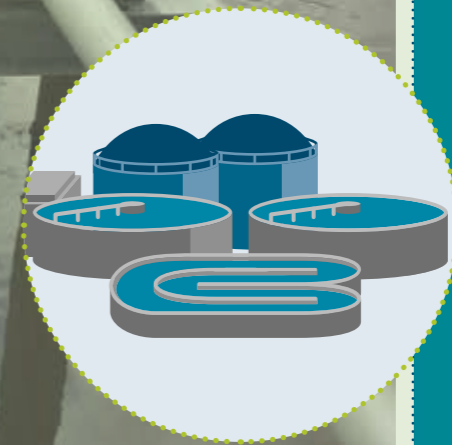


THE RESULT

- PURE reduces energy consumption by up to 25%.
- PURE ensures a better and more stable effluent quality.
- PURE is a robust and easy control system, with a stable treatment process as a result.
- PURE increases the insight into the functioning of your treatment process.

CHARACTERISTICS

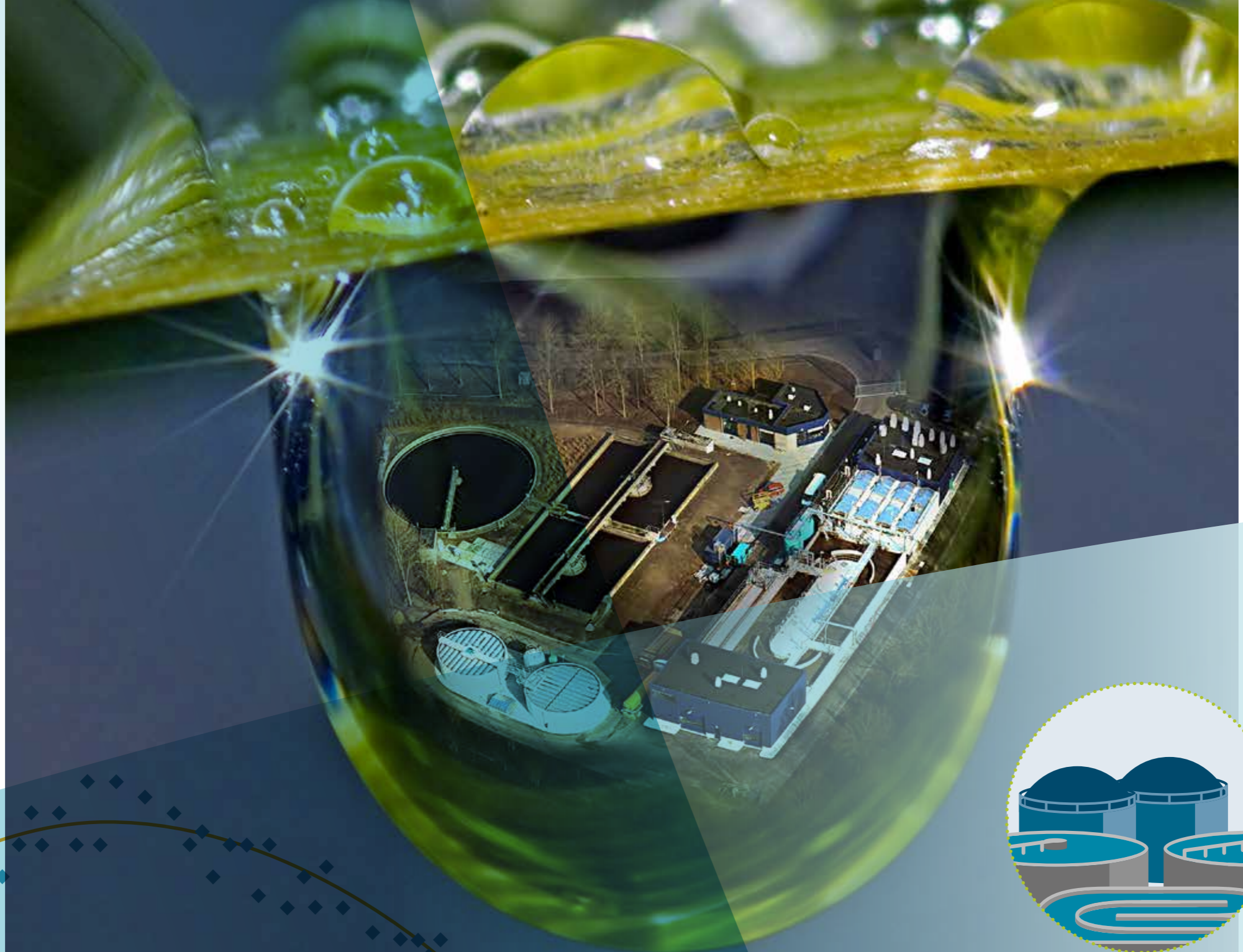
- PURE optimises inflow, aeration, return sludge, excess sludge, internal recirculation, concentrate streams, chemical dosage for P-removal and C-source dosage.
- PURE uses proven prediction algorithms to predict normal flow and storm water flow in order to anticipate changing load on your treatment process.
- PURE uses reliable and robust feedback controls for adjustments based on online measurements.
- PURE can use laboratory measurements to optimise and correct the controls.
- PURE is self-learning and takes into account any failure of measurements, keeping intervention by the business operations to a minimum.



There is a world to win with wastewater treatment sludge. Think about a higher production of energy and raw materials, and a reduction of the sludge disposal and PE consumption, resulting in lower yearly costs. MINE offers the possibility to optimize the sludge line.

During rainfall, a significant amount of primary sludge arrives at the wastewater treatment plant, which is usually pumped into the sludge fermenter immediately. This leads to a lower degradation of sludge, a poor dewatering result, and hence to higher sludge disposal costs. Years of experience show that a sludge digester functions optimally under stable conditions, realised by MINE.

By understanding and controlling the sludge supply and sludge stock, Aquasuite® MINE optimises the capacity of your sludge line, resulting in maximum biogas production, a higher dewatering rate, minimal sludge removal, and thus a healthy business case.

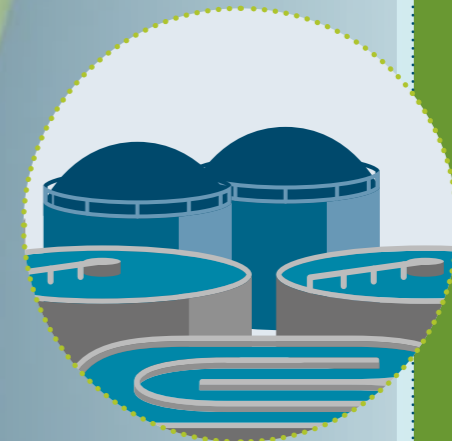


THE RESULT

- MINE ensures an optimal supply of sludge through smart management based on its own current buffer capacity and that supplied by other sewage treatment plants.
- MINE can achieve higher levels of degradation in the biogas fermentation and a more constant biogas flow rate to the CHP plant.
- MINE gives a better dewatering, resulting in a reduction of sludge treatment costs.
- MINE increases the potential for the efficient harvesting of various raw materials.

CHARACTERISTICS

- MINE provides insight in the amount of sludge and the remaining buffer capacity.
- MINE forecasts the expected supply of sludge.
- MINE can perform management tasks both autonomously and supportively.
- MINE optimises the residence time of sludge, thereby improving degradation.
- MINE optimises the PE dosage and sludge flow rate, thereby improving sludge dewatering.



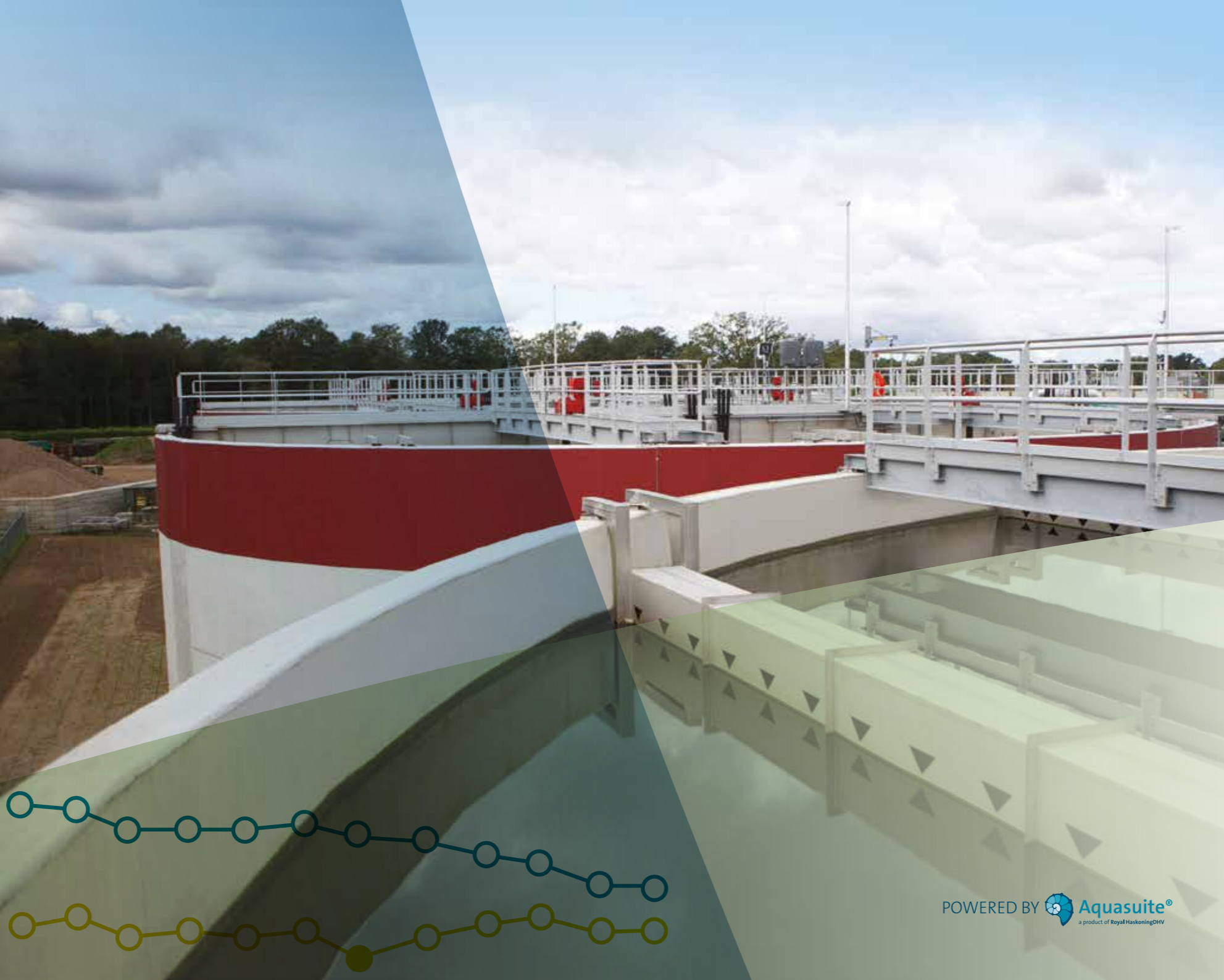
CRYSTALACTOR CONTROLLER

The Aquasuite® Crystalactor Controller combines and analyses available measurement signals in a 'soft sensing' algorithm, thus enabling optimal control of the Crystalactor for the removal and recovery of hardness, heavy metals, phosphates, fluoride or sulphate from drinking, process and wastewater.

The pellet bed management is crucial to the operation of the Crystalactor process. The distribution of the granule diameters must allow sufficient surface area for crystallisation, while the settling rate of the granules must be sufficiently high. This is achieved by the Crystalactor Controller through optimum control of the chemical dosage, the recirculation, the discharge of the pellets and the supply of fine-grained sand.

THE RESULT

- A reduction in chemical use.
- A stable pellet bed, which also creates stable process performance.
- Increased insight and understanding of the crystallisation process.
- Adaptive control resulting in greater user experience.



NEREDA® CONTROLLER

The Nereda® Controller is the heart of your Nereda® plant's automation system and ensures that your wastewater treatment plant always functions optimally.

The measurement data from the system is continuously monitored and analysed, based on which the correct control actions are performed for every situation.

CHARACTERISTICS AND THE RESULT

- Constant and real-time translation of process parameters into process control.
- Easy to operate.
- Automatic response to disruptions.
- Minimal energy and (if needed) chemical consumption.
- Presentation of quickly interpreted performance indicators (KPIs).
- Access to the Nereda® community (My Nereda®) with support and additional reports.
- Annual software upgrades, enabling you to benefit from the latest research results and experiences..
- Early warnings: receive a message before something starts to go wrong rather than afterwards.

ASSET INFORMATION MANAGEMENT

The amount of data and information sources that a water manager needs to assimilate to execute his tasks, is comprehensive and complex.

A good supply of information, certainly in a Central Control Room, is an essential prerequisite for good process performance. This information must meet the needs of the business processes and should be cost-effective to manage. The good planning and management of the integrated application landscape is therefore not a simple matter.

OUR SERVICES

- Drafting of the vision and policies for:
 - process automation;
 - information supply;
 - data management.
- Drafting of the associated implementation programs.
- Supervising the execution of the implementation programs.

THE RESULT

Grip on the continuous improvement of your information management.



THE CENTRAL CONTROL ROOM

The Central Control Room is the central knowledge centre from where organisations responsible for wastewater and/or drinking water uniformly perform the day-to-day operations of all water assets.

THE RESULT

- Uniform control of performance indicators.
- Better grip on performance.
- Maximum return from water assets.
- Reduced vulnerability of individual water assets.
- Continuous focus on optimising the day-to-day operations.
- Less calamities and faster handling of calamities.
- Structural knowledge development and assurance.

OUR SERVICES

- Development of a company-specific vision on central day-to-day operations.
- Development of a program plan for implementation.
- Supervising the implementation.
- Development and implementation of the required Asset Information Management and the appurtenant software tools (KPI dashboards, Human Sensor, Smart Alarm Management).



COMMUNITY PLATFORM

Through a private Community Platform, we offer the users of our technology worldwide support. We share knowledge to optimise continuously, increase our efficiency, work more sustainably, and get the most out of the available water.

A Community Platform offers 24/7 support to technologies by displaying data generated by the system in clear reports with the possibility to offer support, proactively advise, or control from a distance.

Global connection between operators, technologists, partners, suppliers and knowledge institutions also provides the opportunity to share knowledge and offers a breeding ground for innovation. Because we sincerely believe in cooperation, Royal HaskoningDHV facilitates this process and provides advice when required.

An example of a Community Platform is My Nereda®, which provides support to the users of the Nereda® wastewater treatment technology.



MY NEREDA®

The My Nereda® platform supports all users of the Nereda® wastewater treatment technology for optimal results. It also connects partners, licensees, suppliers and end users worldwide for the purpose of sharing knowledge and experience. Not only online, but also face-to-face.

MY NEREDA® PROVIDES:

- Real-time dashboards and trends of interest to management technologists and operators.
- Benchmarks to compare your own system with other Nereda® systems.
- A compilation of all relevant Nereda® information.
- The possibility for online and offline consultancy sessions, discussing dashboards and early warnings, asking questions, submitting sludge photos, discussing problems, etc.
- Knowledge that is always up to date, knowledge experience, executive summaries of interesting articles, webinars.

ABOUT US

Royal HaskoningDHV is an independent, international engineering consultancy service and technology provider with more than 130 years of experience. Backed by the expertise and experience of 7,000 colleagues all over the world, our professionals combine global expertise with local knowledge to deliver a multidisciplinary range of consultancy services for the entire living environment from 100 offices in 35 countries.

By showing leadership in sustainable development and innovation, together with our clients, we are working to become part of the solution to a more sustainable society, now and into the future. Today, the company ranks in the top 50 of independently owned, non-listed engineering companies worldwide and is 13th in Europe.

FOR FURTHER INFORMATION

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