Connective Industries

Water & Environmental Solutions/Industrial Process & Utility

May 28, 2026

Manufacturing & Industry, Water

1. Integrated Management and Control System for Mizumusubi Management Miyagi

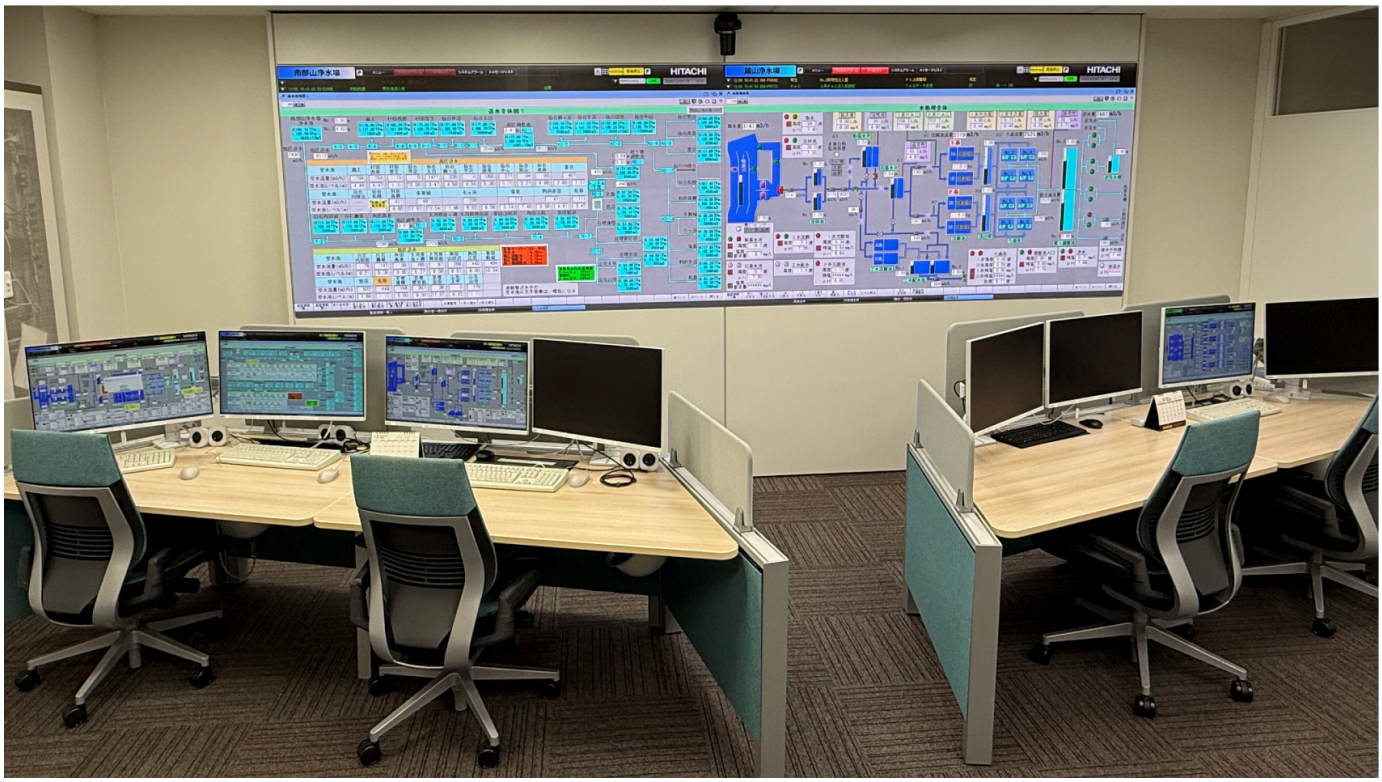
Mizumusubi Management Miyagi Co., Ltd. was established with investments by 10 companies (of which Hitachi was one) with a mandate to run a total of nine different domestic water, industrial water, and wastewater services for a 20-year period from April 2022, and to do so in a way that is distinctive of its home in Miyagi Prefecture.

Hitachi has responsibility for upgrading the monitoring and control systems across all facilities, which include legacy equipment from other vendors. Moreover, an integrated monitoring and control system is currently being put in place that is based on a unified design concept and that provides Mizumusubi Management Miyagi's headquarters with centralized monitoring and operation of all facilities across the nine different services. The monitoring and control system upgrades to the Nambuyama, Fumotoyama, and Nakamine water treatment plants have already been completed and the integrated monitoring and control system has commenced operation.

Since April 2025, the three water treatment plants have been supplying a total of 380,000 cubic meters/day of fresh water to 27 municipalities in Miyagi Prefecture and 20,000 cubic meters/day of industrial water to a number of sites.

The new system has the following features.

(1) Rapid information collection and recovery during disasters, improved safety of operational continuity management, and optimization of personnel assignment
(2) Cloud integration via Open Platform Communications (OPC) and use of data for operation and maintenance
(3) Remote monitoring on a tablet when away from the control room
(4) Security measures that include a firewall, whitelist, and Remote Authentication Dial-In User Service (RADIUS)



[1] Integrated Monitoring and Control System at Mizumusubi Management Miyagi Headquarters

2. Computing Equipment for Water Treatment Division of Yokohama Waterworks Bureau

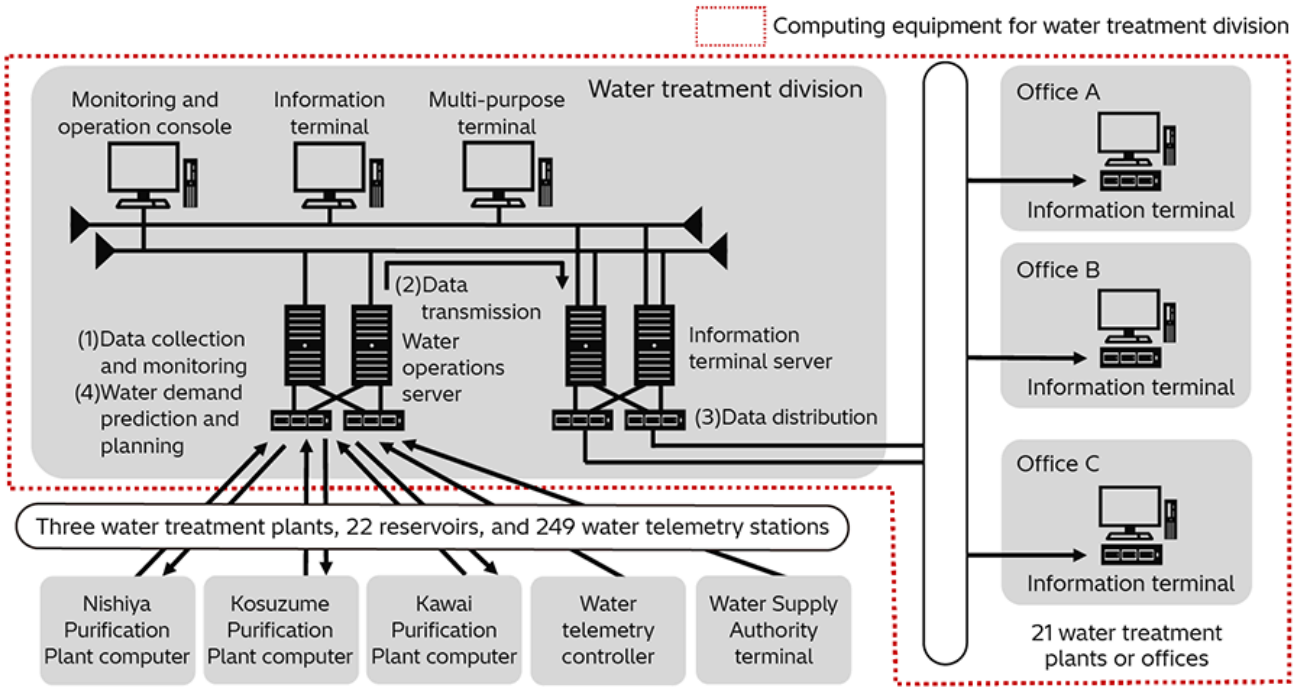
The Yokohama Waterworks Bureau has three water treatment plants and 22 reservoirs, supplying a population of about 3.77 million[*1] with an average of 1.103 million cubic meters of water per day.

Hitachi has installed computing equipment to provide the water treatment division of Yokohama Waterworks Bureau with integrated operation and monitoring of its numerous facilities and other equipment. These include water treatment plants, reservoirs, and water telemetry stations. In addition to the monitoring and collection of water quality and other operational data, the system makes this collected data available to 21 different water treatment plants, offices, and other sites. It also plays an important role in supporting the efficient operation of water distribution by predicting daily water demand and sending setting values for parameters such as pipe flows and reservoir levels to the water treatment plants.

After receiving the order for upgrading the computing equipment used by the water treatment division in FY2021, Hitachi spent approximately three years undertaking a comprehensive upgrade to put a system in place that is highly reliable in terms of both hardware and software.

In the future, Hitachi will continue to help Yokohama Waterworks Bureau achieve its long-term vision for “Water in Yokohama that supports the future of living and town” by conducting maintenance work and functional enhancements to ensure stable operation.

*1. As of FY2024.



[2] Block Diagram of Computing Equipment for Water Treatment Division

3. Upgrade of Central Monitoring and Control Systems at Sengari Purification Plant of Kobe City Waterworks Bureau

The Sengari Purification Plant is a key facility, drawing water from the Sengari Reservoir that serves as the main water source for the Kita Ward of Kobe City and supplying treated water to the northern part of the city. The plant has a water treatment capacity of approximately 108,000 cubic meters per day and uses advanced purification techniques that include rapid filtering and activated carbon treatment to ensure a safe and secure supply of clean water.

Whereas the plant previously had a number of different monitoring systems that operated independently, the installation of a central monitoring system provides for coordinated management of the facility. The wide-screen display enables system-wide monitoring and allows multiple sites to be monitored at the same time, significantly improving both operational efficiency and safety. The reliability and stability of the system have also been boosted through security measures and the provision of backups for key equipment.

Maintenance management, too, has become more efficient as the use of remote monitoring terminals reduces the on-site workload and provides centralized management of inspection and fault information. Furthermore, system functions such as weather information monitoring and surveillance cameras located on- and off-site facilitate a flexible response to natural disasters and improve security against crime.

These enhancements to the equipment and operating practices at the Sengari Purification Plant provide an advanced operational framework that underpins the reliable supply of water to the district.

[3] Use of Wide-screen Display for System-wide Monitoring

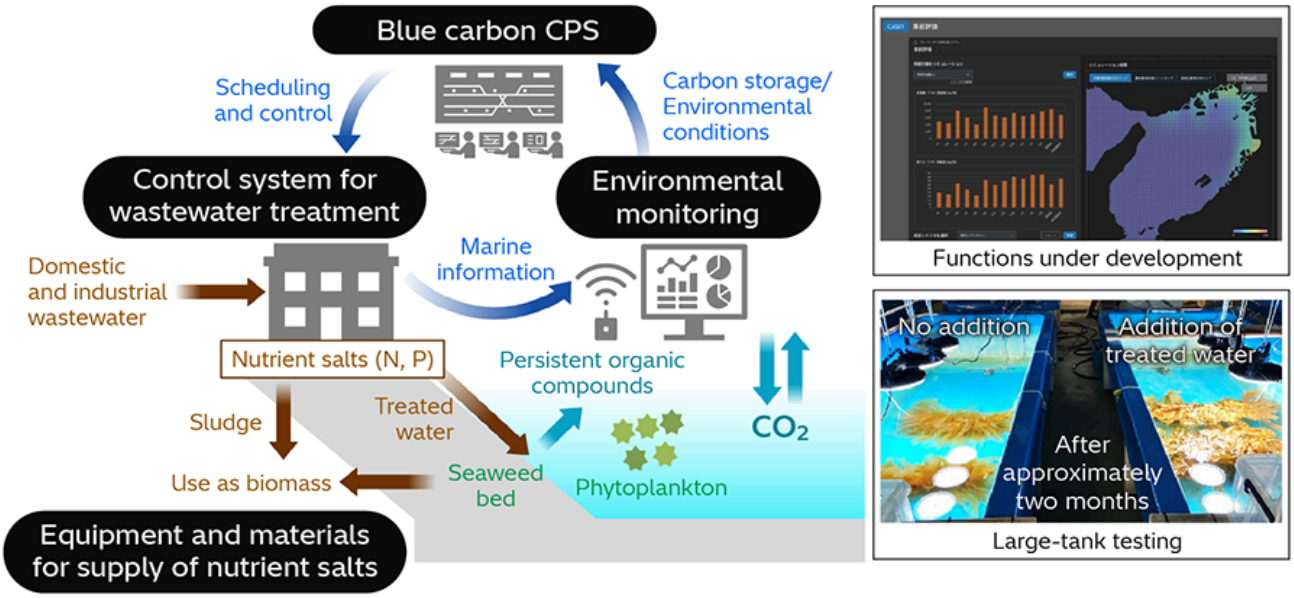
4. Work on Implementing Sewerage Blue Carbon Scheme

Hitachi is creating a blue carbon solution business that utilizes its past experience with the use of sewage treatment control for wastewater and the appropriate supply of nutrient salts from industrial wastewater to combine decarbonization with vibrant ocean environments where seaweed beds can thrive and expand. This has involved engaging in dialogue with organizations that possess a diverse range of specialist expertise and stakeholders facing specific challenges, and also the development of a blue carbon cyber-physical system (CPS). The scope of CPS support extends from wastewater treatment control that can respond flexibly to different water quality requirements to the scheduling of nutrient salt supply and actual operations. The work formed part of a project for managing the supply of nutrient salts to encourage blue carbon that was established as an industry-government-academia collaboration to facilitate commercialization. For the control of wastewater treatment, tests involving additions to treated discharges were conducted using a large tank to assess the consequences of nutrient salt supply. The results indicated that stronger kelp growth was correlated with higher nutrient salt concentrations.

In addition to embarking on an assessment of the environmental impacts of supplying nutrient salts using an ecosystem simulator that uses publicly available data, the blue carbon CPS was also exhibited at the Sewage Works Exhibition '25 Osaka hosted by the Japan Sewage Works Association to show how the functions currently under development are intended to work. Similarly, Hitachi's work on blue carbon received extensive publicity through events held in May and September of 2025 at Expo 2025 Osaka, Kansai.*

In the future, Hitachi intends to use wastewater treatment control as a platform for restoring biodiversity while also playing its part in achieving sustainable marine environments.

* See the list of “Trademarks.”

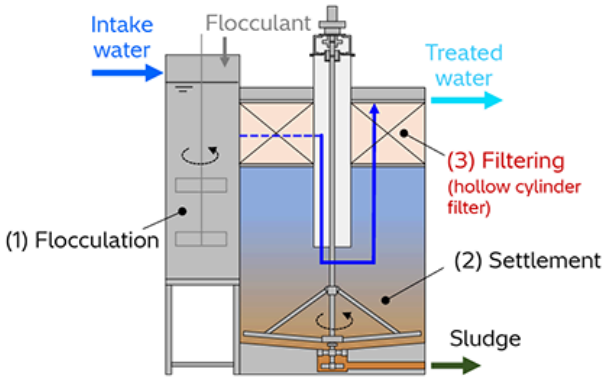


[4] Overview of Blue Carbon Solution

5. Highly Efficient Separation Technology of Suspended Solids

Wastewater from industrial plants can vary widely in response to changes in things like the product mix. This in turn results in a high level of variability in the performance of the wastewater treatment equipment.
One problem with the flocculation and settlement systems used at many plants is that variations in the components of the wastewater can shrink the size of the flocs, causing suspended solids to leak into the water coming out of the settlement process.

In response, Hitachi has developed a treatment unit that adds a filtering stage to the existing flocculation and settlement process. That is, the unit incorporates a filter in the upper part of the settlement stage to remove the flocs that fail to settle. This additional stage maintains the quality of the treated water by preventing flocs from leaking into the water discharged from the settlement process, even when the flocs are small in size. By providing a high level of treatment without using a sand filter at the downstream end of flocculation and settlement, this enables the total size of the wastewater treatment system to be made more compact. In terms of the concentration of suspended solids in treated water from the unit, the filtering stage keeps this below 5 mg/L, much lower than the concentrations of around 20 mg/L achieved by conventional flocculation and settlement. Moreover, the unit design makes the system easier and quicker to install.



Features	
(1) High level of treated water quality	Integrates flocculation, settlement, and filtering The hollow cylinder filter is very efficient at removing suspended material
(2) Efficient use of space	Eliminates the need for filtering after flocculation and settlement Installation space requirements are similar to past flocculation and settlement units
(3) Unit design	The unit design shortens installation time

[5] Schematic of Flocculation, Settlement, and Filtering Unit

6. Establishment of the B Lab, a Cell Culture Experimental Facility for the Creation of Next-Generation Cultivation Technologies

Biopharmaceuticals and bio-based manufacturing have been the subject of growing interest in recent years. However, numerous technical challenges remain in achieving social implementation, particularly with regard to enhancing the efficiency of process development for determining cultivation conditions suitable for commercial-scale production and for advancing scale-up activities.

In April 2025, Hitachi Plant Services Co., Ltd. established a cell culture experimental facility, the “Bio Lab (B Lab),” within the Environmental Innovation Center, a collaborative innovation hub located in Itabashi-ku, Tokyo. B Lab is equipped with multiple bioreactors and analytical instruments suitable for microbial and cell cultivation, and, through the integration of bioreactor simulation technologies with advanced artificial intelligence (AI), is positioned to enhance the efficiency and reliability of process development and to significantly shorten the time required for social implementation.

Going forward, Hitachi Plant Services will steadily advance the sophistication of the design and control of bioreactors, which are mission-critical products, while working in close collaboration with various business divisions of Hitachi, Ltd., including the Water and Environment Business Group, as well as other group companies. Through these initiatives, and by driving the realization of HMAX for industrial bio-based applications utilizing artificial intelligence (AI), the company will contribute to enhancing the productivity of bio-manufacturing and to the long-term realization of a sustainable society[*1].

*1. Epistra and Hitachi leverage AI to achieve one of the world's largest yields and up to a 73% reduction in lab experiment iterations in the production of “(S)-Reticuline,” a pharmaceutical intermediate from Fermelanta (November 2025)

[6] B Lab Experimental Facility for Next-generation Culturing

7. Dry Environment for Collaborative Creation in Battery Manufacturing

Batteries have been finding uses in a wide range of areas over recent years, electric vehicles being one example. This is driving demand for the dry environments needed for their manufacture. The ongoing development of fully solid-state batteries that offer higher performance than conventional lithium-ion batteries with liquid electrolytes is creating a need for low-dew-point environments. Moreover, with automotive and other manufacturers locked in competition, reducing the cost of battery production is likewise essential.

In response, Hitachi Plant Services has equipped its Environmental Innovation Center with an energy-efficient dry room for the production of batteries that achieves even

lower dew-point temperatures than before.

The test chamber is being utilized in collaborative creation projects, providing 35 m^2 of space with a 3-m ceiling and an internal dew-point temperature that is adjustable in the range of –50 to –80°C. While the dehumidifier that is a vital component for maintaining the desired environment required hot air at 150°C for the rotor to regenerate absorbed moisture, testing has demonstrated that it can still supply air with a dewpoint of –80°C or less even when this temperature is reduced to the 80°C range. It is estimated that this reduction in the amount of heating will cut energy use for regeneration by about 50% (approximately 27% of total energy use). Meanwhile, work is underway on putting the facility to use on specific projects, including further development to provide different environments.

[7] Interior of Test Chamber with Variable Dew-point Temperature