

TI Corporate Citizenship Topic Brief



Water and wastewater

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Why it matters

Water is an essential part of manufacturing semiconductors. We use it to create deionized water – a critical component in our production process. Because water is so important to our operations – and to the communities where we operate, we take great care to use it responsibly and efficiently. Conserving water also enables us to reduce costs, ensure long-term availability and preserve this natural resource.



In the last five years*, TI has implemented 351 conservation projects that saved \$11.7 million and ~2.1 billion gallons of water – enough to fill 3,112 Olympic-sized pools.

*2012-2016



Our approach

We focus on reducing overall consumption and then on reusing and recycling water. Our manufacturing and assembly sites around the world set specific goals each year to lower costs and reduce water consumption. We share these combined results in our [Citizenship Performance Report](#). For wastewater, our goal is to have zero violations.

Water use

Our water sources include surface water, collected rainwater and groundwater, primarily from local municipal supplies. We use purified water during the fabrication processes and for rinse baths after chemically processing wafers. We reuse this water in other processes where possible and eventually send it to wastewater treatment plants, where it is neutralized and treated. It is then discharged to municipal sanitary sewers for further treatment.

We also pump water through cooling towers to reject waste heat from the manufacturing process. Water that does not evaporate during this process is treated released back to municipal systems. We reclaim and recycle about a quarter of the water used in manufacturing worldwide, and direct it back into our system for reuse in cooling towers, scrubbers or manufacturing.

Availability

To ensure long-term water availability, we have controls in place to reduce and reuse water where we can. We consult with local water authorities to assess long-term availability and use needs.

At our Texas sites, which make up the largest concentration of our operations, we stay connected with the Texas Water Development Board and its survey activities. Since we are stakeholders in the Dallas Water Utilities long-range water-supply project, we participate in related public meetings and stay current on its status. This enables us to help shape the community's water supply into the future and prepare our own operations.

Three types of water constitute our water footprint:

1. Nonmanufacturing – used in restrooms, irrigation, drinking fountains and cafeterias
2. Manufacturing – used in rinse-bath fills and other processes
3. Manufacturing support – used in exhaust abatement and cooling systems

While we cannot control regions facing drought, we monitor future water availability issues for operations in North Texas, California, Mexico, China and India. Currently, neither TI nor our supply chain is experiencing any issues with water supply.

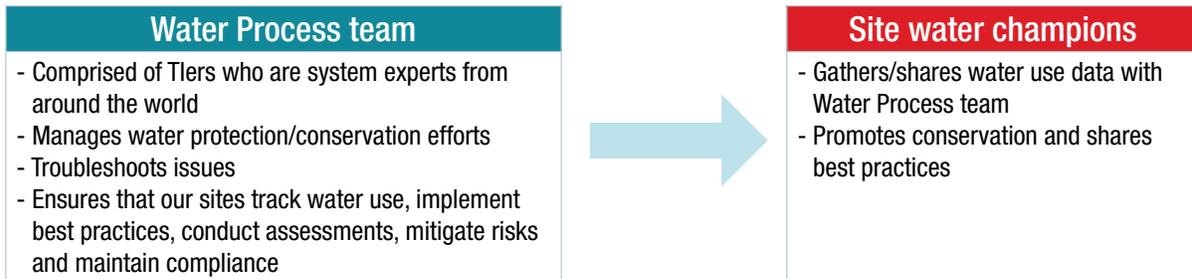
Quality

Water quality standards vary by site, and we adhere to permitted limits to ensure our industrial wastewater and storm water discharges meet local, state and/or country-level requirements. We take additional precautions at sites in Malaysia, Philippines and Japan because treated wastewater is discharged directly into a body of water instead of a municipal treatment facility.

We also have programs and procedures in place to ensure that naturally occurring runoff complies with local and national requirements during normal operations and during construction activities.

Oversight

We have dedicated water teams and champions at our corporate office and sites around the world who monitor consumption, maintain compliance and drive efficiencies. This information is shared monthly with our environmental, health and safety (ESH) leadership.



Management programs

Our water management standard establishes minimum expectations for water, wastewater and storm water management. This standard applies to our manufacturing and assembly/test sites around the world and often exceeds applicable regulatory requirements.

Every two years we conduct formal risk assessments that evaluate whether additional water controls are needed to help ensure business growth, and to assess risks that could reduce or disrupt our supply chain and/or production. We also continually monitor local and country water restrictions and conservation measures.

Additionally, different sites present unique opportunities for creatively conserving water. Some of our water projects include:

- Installing water recirculation units on thermal processing equipment to reduce use of city water
- Reducing water alkalinity (pH) in cooling towers to prevent calcium buildup and scaling – this saves money and uses less water to flush mineral-concentrated water
- Implementing tool optimization and water purification plant projects to conserve millions of gallons of water annually
- Maximizing the amount of condensate and microfiltration water directed to cooling towers
- Reusing reverse-osmosis reject water for toilet flushing and reusing water in our central utility plant cooling towers

See [Environment, safety and health](#) to learn about TI's:

- Management system
- Environmental policies
- Grievance mechanisms
- Governance and accountability

We monitor and manage water at sites we financially control and that are larger than 50,000 square feet. Smaller facilities are typically design or sales facilities that use relatively little water and have little impact.

Because water is so important to our operations and our communities, we work to use it responsibly and efficiently through:

Water	Wastewater
<ul style="list-style-type: none"> - Investing in projects to reduce, recycle and reuse water - Requiring all sites to adhere to our ESH policies and principles, which holistically ensure that we conserve resources - Educating our workforce on how to reduce the size of our water footprint - Encouraging Tlers to report leaks and avoid running water unnecessarily - Developing site-specific water management plans that consider local climate and hydrogeology, water availability and existing controls - Monitoring risks related to water supply, flooding and drought 	<ul style="list-style-type: none"> - Segregating chemicals that have the potential to impact water quality and restricting or banning the use of some chemicals - Ensuring water quality complies with regulatory limits before discharging - Upgrading wastewater systems to maintain compliance, as well as our processes to ensure water quality - Assessing industrial wastewater treatment plants annually and hiring trained or certified operators

Reporting and measurement

Each year, we voluntarily report our water footprint to the [CDP](#), formerly known as the Carbon Disclosure Project, and in our annual [Corporate Citizenship Report](#). This data is compiled from billed quantities from municipal suppliers as well as our production metrics. We also measure effluent rates and volumes, and analyze industrial wastewater and storm water samples using standard methodologies set by the U.S. Environmental Protection Agency.

Evaluating our progress

To assess the effectiveness of our water management strategies, we conduct comparative assessments of tools and processes, benchmark against peers and share best practices. We also track actual water usage at each site as well as projects that were completed to reduce consumption. Site managers review results and compare them to their site's specific water-reduction goals.

For wastewater, we conduct routine audits and inspections and take samples. We also annually evaluate our industrial wastewater treatment plants and hire trained or certified operators as required. Local teams monitor and ensure compliance with regulatory and company standards, and communicate regularly with our worldwide ESH management team.