Protect Our Water

Water is essential to every part of community life. It supplies our homes, farms, schools, hospitals, businesses, wetlands, and wildlife. Yet communities are being asked to approve increasingly large data centers without always knowing how much water they will require, where that water will come from, which chemicals will be used, or what will happen to the water after it leaves the cooling system.

As artificial intelligence increases the amount of computing power concentrated inside these facilities, servers generate more heat and require increasingly powerful cooling systems. Some data centers use air-based or dry cooling, but many rely on water directly or indirectly to remove that heat.

Communities deserve to know: How much water will it use, when will it need the most, what chemicals will be added, and where will the water go afterward?

How Much Water Will Be Needed?

Large data centers can require millions of gallons of water for cooling, although the amount varies according to the facility's size, technology, climate, workload, and cooling design.

Annual estimates can also hide the most important concern: peak demand.

A facility may require the most water during the hottest days of the year, which is often the same time residents, farmers, hospitals, and local utilities are already placing the greatest demand on the water system. Research examining public water capacity has warned that peak withdrawals from rapidly expanding data centers may exceed what some communities can reliably provide.

Before a project is approved, residents should know:

- Its expected daily, monthly, and annual water use
- Its maximum expected use during extreme heat
- Whether its water allocation can be increased later
- Whether additional buildings or phases are planned
- Whether water use will be reduced during droughts
- Who receives priority if the water supply becomes strained

A yearly average is not enough. Communities need to understand the facility's maximum demand and how it could affect water availability during droughts, heat waves, emergencies, and periods of rapid population growth.

Where Will the Water Come From?

Data centers may draw water from a municipal drinking-water system, groundwater wells, rivers, reservoirs, or reclaimed wastewater systems. Each source presents different concerns.

When drinking water is used for cooling, an industrial facility may compete with homes, farms, schools, hospitals, and future community growth for treated water and limited system capacity.

When groundwater is used, large withdrawals can lower the water table and affect nearby residential or agricultural wells. Communities considering groundwater withdrawals should require modeling that examines the entire aquifer, seasonal recharge, existing users, drought conditions, and the cumulative effects of other proposed developments.

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Reclaimed wastewater may reduce the use of drinking water, but it does not make the water impact disappear. The water must still be transported, treated, stored, chemically managed, and eventually discharged, evaporated, or replaced.

Communities should also ask who will pay for new wells, pipelines, pumping stations, water-treatment upgrades, wastewater infrastructure, and system maintenance. Those costs should not quietly be transferred to residents.

Closed-Loop Does Not Mean Water-Free

Developers may describe a cooling system as "closed loop," which can sound as though the same water remains inside the system forever. That is not necessarily what it means.

Closed-loop systems recirculate cooling fluid, which can reduce ongoing water consumption.

However, they may still require initial filling, periodic replacement, maintenance, filtration, leak management, chemical treatment, and additional water to compensate for losses. Some facilities also combine closed internal loops with cooling towers or other external systems that consume water.

The fluid circulating through a closed system may contain water mixed with antifreeze, corrosion inhibitors, stabilizers, buffers, or other treatment chemicals. The system will eventually require maintenance, flushing, repair, or replacement, creating an important question:
What happens to the used cooling fluid when it can no longer remain in the system?

No community should accept the term "closed loop" as a complete answer. Officials should require a full diagram of the cooling system, its expected water consumption, chemical contents, replacement schedule, leak-detection system, and disposal plan.

Chemicals Used in Cooling Systems

Cooling systems must be protected from freezing, corrosion, mineral buildup, bacteria, algae, and biological growth. Depending on the system, operators may use antifreeze compounds, corrosion inhibitors, scale-control products, biocides, disinfectants, pH-adjusting chemicals, and specialized heat-transfer fluids.

Some example chemicals documented in cooling and chilled-water systems include:

- **Ethylene glycol:** An antifreeze and heat-transfer fluid used in some closed cooling loops. Ethylene glycol is toxic if swallowed and requires careful containment, spill response, and disposal.
- **Propylene glycol:** Another antifreeze and heat-transfer fluid. It is generally considered less acutely toxic than ethylene glycol, but large releases can still create environmental problems and increase the oxygen demand placed on waterways as the material breaks down.
- **Sodium hypochlorite:** The active ingredient commonly associated with chlorine bleach. It may be used as a disinfectant or oxidizing biocide to control bacteria and biological growth in cooling towers.

These chemicals serve operational purposes, but they should not remain hidden behind broad descriptions such as "water-treatment products" or "proprietary coolant."

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Not every data center uses every chemical listed above. The exact chemical program depends on the cooling design, source-water chemistry, equipment materials, climate, and operator. That is precisely why each proposed facility should disclose its actual chemical inventory rather than relying on general industry assurances.

PFAS and Fluorinated Cooling Fluids

Some advanced data centers use special cooling liquids instead of relying only on air or water to keep powerful computer equipment from overheating. In some designs, computer components are placed directly into these cooling fluids, a process known as immersion cooling.

Some of these cooling fluids contain PFAS, often called "forever chemicals," because they can remain in the environment for a very long time without breaking down. Products sold under names like Fluorinert and Novec have been used in certain cooling systems and may contain fluorinated chemicals that fall within the broad family of PFAS.

Not every data center uses these types of cooling fluids, but communities should know if they will be used, how they will be stored, and what safeguards are in place to prevent spills or releases into the environment. However, communities should not assume that a proposed facility is PFAS-free without documentation.

Officials should require the developer to disclose:

- Whether any fluorinated heat-transfer fluids will be used
- The chemical name and Chemical Abstracts Service, or CAS, number of every fluid
- Whether any chemical meets a state or federal definition of PFAS
- How much will be stored on-site
- How leaks will be detected
- How spills and firewater will be contained
- How used fluid, filters, absorbents, and contaminated equipment will be disposed of
- Whether replacement chemicals can break down into persistent compounds

A developer should not be allowed to avoid disclosure by calling a substance a proprietary formula. Safety data sheets and complete chemical information should be available to regulators, emergency responders, wastewater utilities, and the public before approval.

Cooling Towers and Concentrated Wastewater

Cooling towers often remove heat by evaporating water. The water that evaporates leaves behind minerals, salts, treatment chemicals, and other substances, causing them to become increasingly concentrated in the remaining water.

To control that buildup, a portion of the water must be removed and replaced. This discharged water is commonly called cooling-tower blowdown.

Blowdown may contain concentrated dissolved solids, chlorides, treatment chemicals, corrosion products, biocides, metals, and altered pH, depending on the source water and chemical program. Closed-loop systems can also create wastewater when they are drained, flushed, cleaned, repaired, or decommissioned.

That wastewater must go somewhere.

It may be discharged into a municipal sewer system, transported off-site, treated on-site, or released under an environmental permit. Sending it to a sewer does not make the concern disappear. Local wastewater plants must be capable of accepting and treating the volume and chemical contents without interfering with treatment operations or passing contaminants into rivers, lakes, groundwater, sludge, or reclaimed water.

Before approval, the public should know:

- The expected volume and frequency of every wastewater discharge
- The complete chemical composition of the wastewater
- Whether it will enter a public sewer or surface water
- Which contaminants the receiving treatment plant can and cannot remove
- Whether pretreatment will be required
- How discharge limits will be monitored and enforced
- Who pays for additional treatment capacity
- What happens when the facility is drained or decommissioned

Leaks, Spills, and Emergency Response

A chemical may remain contained during normal operation but still create risk through equipment failure, pipe rupture, improper maintenance, transportation accidents, fire, flooding, or human error.

Data centers may store cooling fluids, water-treatment chemicals, diesel fuel, lubricants, battery materials, and firefighting substances on-site. A spill could enter storm drains, soil, wetlands, surface water, groundwater, or a wastewater system.

Communities should require a site-specific spill-prevention and emergency-response plan that identifies:

- Every chemical and fuel stored on-site
- Maximum storage quantities
- Secondary containment systems
- Leak-detection and shutoff procedures
- Stormwater protections
- Firewater containment
- Emergency notification requirements
- Cleanup responsibilities
- Financial responsibility for contamination

Emergency responders and local water utilities should review these plans before the project is approved, not after a spill occurs.

Construction Can Affect Water Too

Water concerns begin before a data center opens. Construction may involve clearing vegetation, grading soil, filling wetlands, relocating drainage patterns, drilling wells, installing underground utilities, and pumping groundwater from excavations. These activities can increase erosion, sediment runoff, flooding, and pressure on nearby wetlands or wells.

Large roofs, roads, parking areas, substations, and other paved surfaces prevent rainwater from soaking naturally into the soil. Instead, water runs rapidly across hardened surfaces, carrying sediment, metals, oil, chemicals, and other pollutants toward storm drains and nearby waterways.

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Communities should examine the full site, not only the main data center buildings. The water impact may also include substations, power-generation equipment, fuel storage, pipelines, transmission infrastructure, access roads, and future phases of development.

Cumulative Impacts Matter

A single project may be evaluated as though it exists by itself. But water systems, aquifers, rivers, and watersheds are affected by the combined demands of every home, farm, business, industrial facility, and proposed development.

Approving one data center may also make the area more attractive for additional facilities. The relevant question is not only whether the current system can support one project today. Officials must consider what happens if the facility expands or several more projects follow.

Transparency Before Approval

Communities should not have to rely on promotional estimates or verbal promises. Before approving a data center, local officials should require enforceable public disclosure of:

- The cooling technology that will be used
- Maximum daily and seasonal water demand
- Water sources and withdrawal locations
- Drought-reduction requirements
- A complete chemical inventory
- Safety data sheets and CAS numbers
- PFAS-free certifications, when claimed
- Cooling-fluid replacement and disposal plans
- Wastewater quantity and chemical composition
- Discharge and pretreatment permits
- Spill, firewater, and emergency-response plans
- Independent baseline testing of nearby wells and waterways
- Ongoing public water-use and water-quality reporting
- Financial responsibility for contamination, infrastructure, and cleanup
- Decommissioning plans for remaining fluids and chemicals

Water-use limits and environmental protections should be written into permits or binding agreements. Voluntary sustainability promises can change, especially if a facility is sold to another operator.

Protecting Water Means Thinking Beyond Today

A data center may promise investment, tax revenue, and construction jobs. Those benefits must be weighed against the lasting value of a community's water.

Once an aquifer is depleted, a well is damaged, or water is contaminated, repairing the harm may take years, decades, or may not be fully possible.

Communities should not be forced to discover the true water demands or chemical risks of a data center after construction has begun. The burden should be on the developer to prove, with transparent and independently reviewed information, that the project will not place residents, farmers, utilities, or future generations at risk.

Clean and reliable water is not an expendable resource. It is the foundation of community health, food production, economic stability, and life itself.