MANAGING THE THIRST OF THE AI INFRASTRUCTURE: A PROPOSAL FOR WATER USE TRANSPARENCY AND PERFORMANCE STANDARDS FOR OHIO DATA CENTERS

William J. Gombash

INTRODUCTION

Dating as far back as the 1940s with the world's first programmable computer, data centers have long been a critical component of the nation's digital infrastructure.[1] Since then, they have become the backbone of our digital society, powering nearly everything we rely on today.[2] Online banking, communication, remote work, healthcare, and transportation—these are just a few examples of the everyday necessities enabled by data centers.[3] Over the past few years in particular, society's dependence on data centers has grown significantly with the rapid development of artificial intelligence (AI).[4] Since the public availability of ChatGPT in 2022, generative AI has significantly transformed industry and has become the primary driver of data center growth in the United States.[5] Given this trajectory, it seems evident that data centers will not only remain essential to modern life but will become more and more in demand for the foreseeable future.

While data centers bring significant convenience to our everyday modern lives, they also impose substantial environmental burdens, consuming large amounts of electricity and water to

---

[1] Nathan Oakley, *The Evolution of Data Centers*, ARCGIS STORYMAPS (Feb. 21, 2021), https://storymaps.arcgis.com/stories/a21d93abf29d4b6990370cfcba143cd9.
[2] Emil Sayegh, *Data Centers At The Heart Of The AI And Digital Economy Surge*, FORBES (Sep. 25, 2024), https://www.forbes.com/sites/emilsayegh/2024/09/25/data-centers-at-the-heart-of-the-ai-and-digital-economy-surge/.
[3] *6 Ways Data Centers Impact Our Lives and Communities*, CORESITE, https://www.coresite.com/blog/6-ways-data-centers-impact-our-lives-and-communities (last visited Dec. 30, 2025).
[4] James Fell, *Stanford just released its annual AI Index report. Here's what it reveals*, WORLD ECON. F. (Jun. 3, 2025), https://www.weforum.org/stories/2024/04/stanford-university-ai-index-report/.
[5] *Id.*; *The Next Big Shifts in AI Workloads and Hyperscaler Strategies*, MCKINSEY & CO. (Dec. 17, 2025), https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/the-next-big-shifts-in-ai-workloads-and-hyperscaler-strategies.

keep high-powered servers running around the clock.[6] A substantial amount of a data center's water consumption is attributable to its cooling systems.[7] Computers generate a significant amount of heat and require cooling to function efficiently.[8] AI data centers require even more cooling than traditional data centers because training and running complex AI models involves sustained, heavy computation, which generates constant intense heat.[9] With AI's rapid growth showing no signs of slowing, the demand for data center cooling—and the water required to support it—will only intensify.

Ohio has rapidly become a prime location for data center development, thanks in part to its temperate climate and abundant water resources, both of which support efficient cooling.[10] As of writing this article, Ohio has 194 data centers, the fifth highest number of data centers in the United States.[11] Not only is Ohio a strategically ideal location for data centers, but data centers have also proven mutually beneficial, driving both job growth and tax revenue for the

---

[6] *Data Centers and Environmental Considerations,* AAAS https://www.aaas.org/sites/default/files/2025-09/Data%20Centers%20Fact%20Sheet%202%20-%20Data%20Centers%20and%20Environmental%20Considerations.pdf (last visited Dec. 30, 2025).

[7] Mara Pusic, *AI's Cooling Problem: How Data Centers Are Transforming Water Use,* ENV'T L. INST. (Oct. 23, 2025), https://www.eli.org/vibrant-environment-blog/ais-cooling-problem-how-data-centers-are-transforming-water-use.

[8] *Data Centers and Environmental Considerations, supra* note 6.

[9] Ganesh Hegde, *Conventional vs AI Data Center Cooling Options and How Much Wastewater is Being Generated*, KETOS (Jul. 17, 2024), https://ketos.co/conventional-vs-ai-data-center-cooling-options-and-how-much-wastewater-is-being-generated#:~:text=Operations:%20Conventional%20vs..,AI%2Dfocused,based%20and%20hybrid%20cooling%20systems.

[10] *The Heartland Advantage: Ohio's Growing Tech Hub*, THE INST. (Aug. 11, 2025), https://www.institute.tech/insights/the-heartland-advantage-ohios-growing-tech-hub; Kendall Crawford, *As Data Centers Boom in Ohio, Local Communities Are Watching Their Water*, THE OHIO NEWSROOM (Oct. 15, 2025 at 8:54 AM EDT), https://www.statenews.org/section/the-ohio-newsroom/2025-10-15/as-data-centers-boom-in-ohio-local-communities-are-watching-their-water.

[11] *USA Data Centers*, DATA CTR. MAP https://www.datacentermap.com/usa/ (last visited Jan. 22, 2026).

state.[12] As one of the nation's most significant data center hubs, the continued growth of data centers in Ohio seems all but certain.

Of Ohio's 194 data centers, 113 are located in central Ohio, where industrial cooling water demands are projected to increase by approximately 120% from 2021 to 2050.[13] In their 2025 regional water study of Central Ohio, the Ohio Environmental Protection Agency (Ohio EPA), Ohio Department of Natural Resources (ODNR), and Ohio Water Development Authority project that the region could face significant water resource gaps by 2040 without meaningful action to better manage and plan for rising demand.[14] Despite the rising demand for data centers and anticipated water resource gaps, Ohio currently has no requirement for data centers to track, report, or publicly disclose their water use, leaving regulators and communities without even a baseline understanding of the sector's total water demand.[15]

Data centers undoubtedly continue to embed themselves deeper into the fabric of modern life. Yet, just as their services have become indispensable to the functioning of modern society, water remains an equally indispensable natural resource. Supporting the continued expansion of this critical digital infrastructure therefore requires confronting the challenge of safeguarding the water resources on which it and our communities depend. To that end, Ohio must adopt a regulatory approach capable of accommodating data center growth while protecting the state's finite water resources.

---

[12] SRC Evalmetrics, *Economic Impacts Study of Data Centers in Ohio*, OHIO CHAMBER OF COM. RSCH. FOUND. 2 (Sep. 2025), https://ohiochamberfoundation.com/wp-content/uploads/9.29.-25-EXECUTIVE-SUMMARY-V5.pdf.
[13] *USA Data Centers*, *supra* note 11; *Central Ohio Regional Water Study: 15-County Area Report Out*, OHIO EPA 17 (Mar. 15, 2025), https://dam.assets.ohio.gov/image/upload/epa.ohio.gov/Portals/0/water/CentralWaterStudyOverview.pdf.
[14] *Central Ohio Regional Water Study*, *supra* note 13.
[15] Kendall Crawford, *supra* note 10.

This article proceeds in three parts. First, this article briefly outlines the background of data centers, their water footprint, and their fast-paced growth in Ohio. Second, this article outlines the current regulatory scheme over water use and its gaps with regards to data centers. Third, this article argues that Ohio must implement requirements for data centers to track and report this water use to provide regulators with a baseline understanding of the sector's water use and outlines key factors that should be utilized to guide the development of water use performance standards for data centers.

I. BACKGROUND

A. *Data Centers – A Brief History*

Data centers are the backbone of the digital infrastructure that drives our modern society and economy.[16] They are physical facilities that house large-scale computing systems organizations use to collect, process, and store data, and connect to the outside world.[17]

The idea of centralized data storage dates back to the 1940s with the mainframe computer, which required a dedicated room to support a single machine.[18] For the first few decades, only governments, universities, and large corporations could afford such infrastructure.[19] By the 1990s, the rise of personal computing and networking created a need for IT infrastructure across businesses of all sizes, leading many companies to build in-house server rooms.[20] In the early 2000s, the explosion of the internet spurred the development of purpose-

---

[16] *About the Data Center Industry*, DATA CTR. COAL. https://www.datacentercoalition.org/data-center-industry (last visited Jan. 9, 2026).
[17] Joe Hertvik & Muhammad Raza, *Data Centers Explained: Types, Features, and Choosing the Right Model*, SPLUNK (Jun. 13, 2025), https://www.splunk.com/en_us/blog/learn/data-centers.html.
[18] *A Journey Through the History of Data Centers: From Concept to Cloud*, PROSOURCE (Oct. 26, 2024), https://www.team-prosource.com/a-journey-through-the-history-of-data-centers-from-concept-to-cloud/.
[19] *History of Data Centers: From Server Rooms to AI-Driven Powerhouses* TRGDATACENTERS https://www.trgdatacenters.com/resource/history-of-data-centers/ (last visited Jan. 9, 2026).
[20] *Id.*

built data centers—large facilities built for the sole purpose of housing IT infrastructure.[21] The rise of cloud computing later supercharged the demand for data centers and companies such as Amazon, Microsoft, and Google began building hyperscale facilities to meet this demand, allowing companies to rent processing power and storage from these providers rather than maintain their own physical servers.[22] Today, AI serves as the latest and most significant driver of the demand for data centers as the training of large AI models requires substantially more computer power.[23]

From server rooms to hyperscale facilities, the evolution of data centers demonstrates how technological advances have expanded the role of data centers in modern life. With this growth, however, has also come a dramatic increase in the resources required to sustain them. This raises the critical question of how to balance the continued expansion of data centers with the conservation of natural resources such as water.

B. *The Water Footprint of Data Centers*

Along with the conveniences that data centers bring to our everyday modern lives also come environmental burdens. One specific burden is the consumption of natural resources such as water.[24] Water consumption by data centers happens in two ways—direct consumption and indirect consumption.[25] Indirect water consumption includes the water consumed to generate the electricity used to power data centers and the water consumed to manufacture materials used to construct the data center.[26] Direct water consumption—which is the focus of this article—

---

[21] *Id.*
[22] *Id.*
[23] *Id.*
[24] Mara Pusic, *supra* note 7.
[25] *Id.*
[26] *Id.*

primarily involves water consumed for cooling.[27] Data centers generate a significant amount of heat and require cooling to function efficiently.[28] AI data centers require even more cooling than traditional data centers because training and running complex AI models involves sustained, heavy computation, which generates constant intense heat.[29]

A 2024 report estimates that, in 2023, the direct water use of data centers across the United States amounted to an estimated 17.4 billion gallons.[30] That is a 211% increase from the estimated 5.6 billion gallons consumed by data centers just ten years earlier in 2014.[31] The report further estimates that, by 2028, the annual direct consumption of water by data centers could be as much as 72.6 billion gallons.[32] Notably, this data is based on modeling that was performed using "assumptions developed from limited publicly available data, proprietary market analyst data, and reviewed by industry representatives and stakeholders."[33] The report notes that providing a sound characterization of water use would require ongoing data collection and reporting by data centers and such data would allow regulators to anticipate impacts and make balanced and informed decisions.[34] Currently, data centers are not required to track and report their water use and it is estimated that fewer than one-third of data centers are tracking their

[27] *Id.*
[28] *Data Centers and Environmental Considerations, supra* note 6.
[29] Ganesh Hegde, *supra* note 9.
[30] Arman Shehabi et al., *2024 United States Data Center Energy Usage Report*, ESCHOLARSHIP 55 (Dec. 2024), https://escholarship.org/uc/item/32d6m0d1#page=16.
[31] *Id.*
[32] *Id.* at 56.
[33] *Id.* at 67.
[34] *Id.*

water use.[35] This makes it critically challenging to determine just how much water is actually consumed by data centers.[36]

A data center's direct water use footprint depends largely on the type of cooling technology it utilizes.[37] Today, data centers have multiple different cooling options available to them, each with its own advantages and disadvantages.[38] However, the decision on which cooling technology to employ often involves balancing energy efficiency, water consumption, and total cost.[39] The cooling technologies available to data centers can essentially be grouped into two categories—air cooling and water cooling.

The traditional method is air cooling, which involves moving hot air out of server rooms and moving cold air in.[40] Air cooling systems are often water-intensive as they typically use evaporative systems such as cooling towers to chill the air used to cool the server room.[41] These types of cooling systems are often favored because they are simple, have low initial installation costs, and are relatively energy efficient.[42] However, use of evaporative cooling systems means

---

[35] Helena Volzer, *A Finite Resource: Managing the Growing Water Needs of Data Centers, Critical Minerals Mining, and Agriculture in the Great Lakes Region*, ALL. FOR THE GREAT LAKES 20 (Aug. 2025), https://greatlakes.org/wp-content/uploads/2025/08/AGL_WaterUse_Report_Aug2025_Final.pdf.
[36] *Id.*
[37] *See Calculating the Impact of Water Usage on Data Center Costs and Sustainability*, VERTIV https://www.vertiv.com/4ad73a/globalassets/documents/white-papers/vertiv-water-usage-and-sustainability-wp-en-na-web_317594_0.pdf?Content-target=white-paper (last visited Jan. 9, 2026).
[38] Christopher Tozzi, *Data Center Cooling Methods: Costs vs. Efficiency vs. Sustainability*, DATA CTR. KNOWLEDGE (Oct. 31, 2025), https://www.datacenterknowledge.com/cooling/data-center-cooling-methods-costs-vs-efficiency-vs-sustainability.
[39] *See Calculating the Impact of Water Usage on Data Center Costs and Sustainability*, *supra* note 37.
[40] *Liquid Cooling vs Air Cooling Data Center: Pros, Cons, Costs & Which is Better?*, ACCESS FLOOR STORE (Nov. 19, 2025), https://www.accessfloorstore.com/news/459--liquid-cooling-vs-air-cooling-data-center-pros-cons-cost--which-is-better.
[41] *Cooling Water Efficiency Opportunities for Federal Data Centers*, U.S. DEP'T OF ENERGY https://www.energy.gov/femp/cooling-water-efficiency-opportunities-federal-data-centers (last visited Jan. 10, 2026).
[42] Christopher Tozzi, *supra* note 38.

that about 80% of the water used by the data center evaporates.[43] This means that the water is consumptively used and won't be discharged back into the water basin from which it was withdrawn.[44] As an alternative to evaporative systems, air cooling systems can utilize mechanical chilling systems to chill cooling air, much like a household air conditioner.[45] Mechanical chilling systems eliminate the direct consumption of water for cooling purposes.[46] However, mechanical chilling systems are generally disfavored as they are energy-intensive, thus adding to their indirect water consumption and also making them costly to operate.[47]

Liquid cooling, a more recent cooling technology, involves the use of fluids (as opposed to air) to remove heat from IT equipment.[48] Liquid cooling systems can use water or specialized coolants, and there are two main approaches—direct-to-chip cooling and immersion cooling.[49] Direct-to-chip cooling circulates fluid through closed loop piping systems near heat-generating components, targeting only the sources of the heat.[50] Immersion cooling involves the submersion of IT equipment in non-conductive liquid to absorb and dissipate heat.[51] Overall, liquid cooling is favorable because it removes heat more efficiently than air cooling, uses up to 90% less water, and is relatively energy efficient.[52] However, liquid cooling systems require specialized

---

[43] Miguel Yañez-Barnuevo, *Data Centers and Water Consumption*, EESI (June 25, 2025), https://www.eesi.org/articles/view/data-centers-and-water-consumption.
[44] *Consumptive Use Permit*, ODNR https://ohiodnr.gov/buy-and-apply/regulatory-permits/water-use-management/consumptive-use-permit (last visited Jan. 14, 2026).
[45] Christopher Tozzi, *supra* note 38.
[46] Steve Berens, *The Water-Energy Trade-Off: How Cooling Choices Drive Data Center Usage*, CLEAR COMFORT https://clearcomfort.com/water-energy-trade-off-cooling-choices-data-center-use/ (last visited Jan. 10, 2026).
[47] *Id.*
[48] *Liquid Cooling vs Air Cooling Data Center: Pros, Cons, Costs & Which is Better?*, *supra* note 40.
[49] *Id.*
[50] Christopher Tozzi, *supra* note 38.
[51] *Id.*
[52] *Id.*; SRC Evalmetrics, *supra* note 12 at 6.

equipment, resulting in a much higher upfront installation cost than air cooling.[53] Additionally, these systems are rather complex, requiring skilled personnel for maintenance and upkeep.[54]

The majority of a data center's direct water consumption occurs as a result of its cooling processes.[55] While water consumption is estimated to be significant and expected to increase tremendously over the next several years, it is difficult to understand exactly how much water data centers consume because there is currently no requirement for data centers to track and report their water use.[56] Additionally, while there are multiple different cooling options available, each with varying levels of water intensity, there is currently no policy or regulation requiring or incentivizing the adoption of less water-intensive systems over others.[57] Until such policy and regulation is implemented, data centers will likely continue to favor water-intensive cooling methods due to their low installation and operational costs.

C. *Ohio's Data Center Boom*

Ranking fifth nationally in its number of data centers, Ohio has quickly become a hub for data center development and AI, drawing more than $40 billion in private data center investment.[58] Its central location, temperate climate, energy infrastructure, and perceived abundance of water make it an ideal location for data center development.[59] Additionally, Ohio has implemented a 100% sales tax exemption on equipment and construction that reduces

---

[53] Christopher Tozzi, *supra* note 38.
[54] *Id.*
[55] *See Calculating the Impact of Water Usage on Data Center Costs and Sustainability*, *supra* note 37.
[56] Helena Volzer, *supra* note 35.
[57] Christopher Tozzi, *supra* note 38; *see* Josh Gehring, *Understanding the Data Center Water Regulation Debate*, ACE (July 22, 2025), https://ace-usa.org/blog/research/research-environmental-policy/understanding-the-data-center-water-regulation-debate/.
[58] *The Heartland Advantage: Ohio's Growing Tech Hub*, *supra* note 10; *USA Data Centers*, *supra* note 11; SRC Evalmetrics, *supra* note 12 at 2.
[59] *The Heartland Advantage: Ohio's Growing Tech Hub*, *supra* note 10; Kendall Crawford, *supra* note 10.

construction costs by 6-8%, further making Ohio an ideal location for data center development.[60] Not only is Ohio an ideal location for data centers, but data centers have also proven economically beneficial to the state.[61] Between 2017 and 2024, the data center industry contributed $5.21 billion in tax revenue and jobs supported by data centers increased from 38,400 to 95,200 (a 148% increase).[62] With no sign of slowing demand, Ohio's data center boom is expected to sustain strong momentum through the end of the decade.[63] With this rapid expansion comes a mounting pressure on Ohio's water resources, raising questions about how the state will manage the industry's growing demand.[64]

Of Ohio's 194 data centers, 113 (58%) are concentrated in central Ohio, where industrial cooling water demands are projected to increase by approximately 120% from 2021 to 2050.[65] Despite Ohio's abundant water resources, it is expected that data center growth will strain water resource infrastructure.[66] A recent regional water study projects 56 water supply gaps by 2040 without meaningful action to better manage and plan for rising demand.[67] In its 2025 "Economic Impact Study of Data Centers in Ohio," even the Ohio Chamber of Commerce acknowledges that advanced cooling technologies such as liquid cooling can address these gaps by cutting direct water consumption by up to 95%.[68] However, without policy or regulation to push data centers toward liquid cooling, data centers are likely to continue using water-intensive air cooling due to their low installation and operating costs.

---

[60] SRC Evalmetrics, *supra* note 12 at 3.
[61] *Id.* at 2.
[62] *Id.* at 2-3.
[63] *Id.* at 4.
[64] *See* Kendall Crawford, *supra* note 10.
[65] *USA Data Centers*, *supra* note 11; *Central Ohio Regional Water Study*, *supra* note 13.
[66] SRC Evalmetrics, *supra* note 12 at 6.
[67] *Central Ohio Regional Water Study*, *supra* note 13 at 32.
[68] SRC Evalmetrics, *supra* note 12 at 6.

II. THE CURRENT STATE—AND LIMITS—OF WATER-USE REGULATION

Ohio's rapidly expanding data-center sector operates within a water-use framework that was never designed to manage high-volume industrial demand. The state relies primarily on a combination of common law riparian principles and a narrow statutory registration system administered by the Ohio Department of Natural Resource (ODNR)—neither of which provides meaningful oversight of data center water consumption.[69] As a result, Ohio's current regulatory structure leaves significant gaps in the state's ability to understand or manage the data center sector's growing water demand.

A. *Riparian Rights and the Reasonable Use Doctrine*

In the United States, the right to use surface water is governed at the state level and, depending on the state, one of three common law approaches are generally followed.[70] Riparian rights allocate the right to water use based on the ownership of land adjacent to a surface water from which water may be drawn.[71] Riparian rights require water use to be reasonable as not to interfere with the water use rights of other riparian landowners.[72] Prior appropriation rights operate on a "first in time, first in right" basis, giving initial senior users a right superior to that of later junior users.[73] Hybrid rights combine riparian and prior appropriation rights into a permit system managed by the state.[74] Like nearly all states east of the Mississippi River, Ohio

---

[69] *See* Peggy Kirk Hall, *Understanding Water Rights in Ohio*, OHIO STATE UNIVERSITY https://farmoffice.osu.edu/sites/aglaw/files/site-library/Understanding%20Water%20Rights%20in%20Ohio.pdf (last visited Jan. 10, 2026); *see Water Withdrawal Facilities Registration*, ODNR https://ohiodnr.gov/buy-and-apply/regulatory-permits/water-use-management/water-withdrawal-facilities-registration (last visited Jan. 14, 2026).
[70] *Sidebar: By the Books – An Overview of Surface Water Use Rights in the United States*, FJC https://www.fjc.gov/content/376802/water-and-law-sidebar-books-overview-surface-water-use-rights-united-states (last visited Jan. 10, 2026).
[71] *Id.*
[72] *Id.*
[73] *Id.*
[74] *Id.*

recognizes riparian rights for surface water use.[75] Ohio's application of the riparian rights approach is shaped through the state's case law, which established a reasonable use doctrine as the governing rule that it applies to not only surface water, but ground water also.

A good example of Ohio's application of the riparian rights approach to surface water is found in the Ohio Supreme Court's 1902 holding in *Canton v. Shock*. In *Canton*, the City of Canton had a public water utility that abutted and collected water from Nimishiller creek to supply its inhabitants.[76] Shock owned a water-powered grist mill which also abutted the creek a short distance downstream of Canton.[77] As the City of Canton grew, its water withdrawal from the creek increased to the extent that, during dry seasons, the downstream mill lacked adequate water flow to operate its processes.[78] Shock thus commenced action against the city seeking to recover damages for its diminished water supply.[79] In its defense, the city claimed to be a riparian owner, having no lesser rights to the water than the downstream mill.[80] The court held that the city, in its corporate capacity, was a riparian land owner and entitled to riparian rights in the creek to which its public utility abutted.[81] The court further held that the right of the city to use the water within the creek was at least equal to the mill's, so long as its uses of the water were reasonable.[82] The court explained that in situations where an insufficient supply of water exists within the creek to supply all demands, each riparian owner must use the water reasonably as to do as little injury to the other as possible.[83] Both must essentially bear a reasonable

---

[75] *Id.*
[76] Canton v. Shock, 66 Ohio St. 19, 20 (1902).
[77] *Id.* at 21.
[78] *Id.*
[79] *Id.*
[80] *Id.*
[81] *Id.* at 28-29.
[82] *Id.* at 29.
[83] *Id.* at 30.

proportion of the loss.[84] The court remanded the case to be decided by a jury whether the city's use of water was unreasonable under the circumstances.[85] More than a century later, the reasonable use approach to riparian rights articulated in *Canton* remains unchanged, and the court has since adopted a parallel rule for groundwater.

In its 1984 holding in *Cline v. American Aggregates Corp.*, the Ohio Supreme Court extended the reasonable use doctrine to groundwater, analogizing groundwater rights to the riparian rights governing surface water.[86] In *Cline*, American Aggregates operated a sand, gravel, and stone quarry which required continuous pumping of water from pits created by the quarrying operation.[87] Twenty-six nearby landowners sued American Aggregates alleging that its pumping of its quarry pits unreasonably caused dewatering and pollution of their wells.[88] The court ultimately adopted a reasonable use doctrine, holding that a landowner is liable when its withdrawal of groundwater (1) unreasonably harms a neighboring landowner by lowering the water table; (2) exceeds the landowner's reasonable share of groundwater; or (3) has a direct and substantial effect on a watercourse or lake, unreasonably harming a person entitled to use the water within it.[89] The court explained that this doctrine serves to "insure the protection of a landowner's property rights in ground water to the same degree that the riparian doctrine protects the interests of the landowners adjacent to a stream."[90] More recently, *McNamara v. City of Rittman*, tested the boundaries of groundwater rights in the municipal context, illustrating the continued relevance of Ohio's common law framework to contemporary water use conflicts.

---

[84] *Id.*
[85] *Id.* at 34.
[86] *See* Cline v. Am. Aggregates Corp., 15 Ohio St. 3d 384 (1984).
[87] *Id.* at 384.
[88] *Id.* at 385.
[89] *Id.* at 387.
[90] *Id.* at 386.

In *McNamara v. City of Rittman*, the city of Rittman purchased a tract of land near Sterling, Ohio with the intention of drilling three wells to serve Rittman's municipal water needs.[91] The plaintiffs—homeowners of Sterling—sued Rittman, alleging that its pumping operations lowered their aquifer and caused poor water quality.[92] Citing *Cline*, the court explained that the ownership of real property includes the right to use the groundwater beneath it and the reasonable use doctrine adopted in *Cline* serves to protect that right.[93] The court thus reaffirmed that groundwater use is governed by the same reasonable use framework that applies to surface water withdrawals under Ohio's riparian rights doctrine.

In addition to the common law reasonable use doctrine developed through cases such as *Canton*, *Cline*, and *McNamara*, Ohio has also enacted a statutory definition of what constitutes reasonable use, framing reasonable use in terms of the interests of the user, those harmed, and society as a whole.[94] Factors include the purpose, economic value, and social value of the use, suitability of the use to the water source, the extent and amount of harm caused, and practicality of avoiding the harm, among other factors.[95] While this statutory language articulates factors relevant to assessing reasonable use, the factors are inherently subjective, providing no clear objective limitations or prospective standards to what constitutes reasonable use.

Ohio's common law approach to water use rights reflects a fundamentally subjective and reactive framework. Water users are largely free to withdraw surface water or groundwater unless and until their use is shown to be unreasonable in light of competing interests. Although this doctrine provides a reactive means for resolving disputes between competing water users, it

---

[91] McNamara v. City of Rittman, 107 Ohio St. 3d 243, 243 (2005).
[92] *Id.*
[93] *Id.* at 246.
[94] Ohio Rev. Code Ann. § 1521.17.
[95] *Id.*

provides no proactive mechanism for prospective planning or for assessing the impact of large-scale withdrawals—limitations that become increasingly significant as modern industrial users, such as data centers, place unprecedented demands on Ohio's water resources. Additionally, as this article will later discuss, because data centers obtain their water from municipal water suppliers and do not physically withdraw the water themselves, they fall out of the reach of the reasonable use doctrine altogether.

B. *ODNR Registration, Reporting, and Permitting Requirements*

Beyond the common law reasonable use doctrine governing water withdrawal, Ohio's only statewide mechanism for tracking large water withdrawals is the registration and reporting program administered by the Ohio Department of Natural Resources (ODNR) under ORC § 1521.17.[96] Under this rule, any facility with the capability to withdrawal more than 100,000 gallons of water per day must register with the ODNR.[97] Additionally, registered facilities must annually report the volume of water withdrawn during each calendar year.[98] The registration and reporting requirements apply to both ground water and surface water withdrawals.[99] Registration under this rule does not give a registered facility a right or privilege to water withdrawal.[100] The right to withdraw water is still governed by the common law reasonable use doctrine.

Although the ODNR registration and reporting program creates a centralized record of large-capacity withdrawals, it does not provide any means for regulating water use. Because it does not convey any right or privilege to withdrawal water, it likewise cannot impose any

---

[96] *Water Withdrawal Facilities Registration*, *supra* note 69; Ohio Rev. Code Ann. § 1521.17.
[97] *Water Withdrawal Facilities Registration*, *supra* note 69; Ohio Rev. Code Ann. § 1521.17.
[98] *Water Withdrawal Facilities Registration*, *supra* note 69; Ohio Rev. Code Ann. § 1521.17.
[99] *Water Withdrawal Facilities Registration*, *supra* note 69; Ohio Rev. Code Ann. § 1521.17.
[100] *Water Withdrawal Facilities Registration*, *supra* note 69.

limitations or conditions on water withdrawal. Accordingly, the program operates merely as an informational tool rather than a mechanism for proactive oversight or resource protection.

While ODNR's role over water use in Ohio appears more informational than permissive or restrictive, certain large-capacity withdrawal and consumptive use facilities are required to obtain permits through ODNR.[101] These requirements, however, apply only to a narrow subset of facilities. For example, ORC § 1522.12, which applies specifically within the Lake Erie watershed, requires a withdrawal and consumptive use permit when a facility proposes a new or increased capacity to withdraw or consumptively use an average of one million gallons per day of ground or surface water, or 2.5 million gallons per day of surface water directly from Lake Erie, over any 90-day period.[102] This rule has been in place since 2009, making it applicable only to new and increased withdrawal and consumptive use capacities, and as of March 2022, only one permit had been issued.[103]

Additionally, under ORC § 1521.23, which applies to the rest of Ohio, a consumptive use permit is required when a facility proposes a new or increased capacity to consumptively use more than an average of two million gallons per day anywhere in Ohio in any 30-day period.[104] This rule has been in place since the late 1980s and only four permits have been issued, all within the last five years.[105] Moreover, public water systems are exempt from consumptive use

---

[101] *Water Use & Management*, ODNR https://ohiodnr.gov/buy-and-apply/regulatory-permits/water-use-management (last visited Jan. 14, 2026).
[102] Ohio Rev. Code Ann. § 1522.12
[103] *Withdrawal and Consumptive Use Permit*, ODNR https://dam.assets.ohio.gov/image/upload/ohiodnr.gov/documents/water/WIPP/WCU%20FAQ.pdf (last visited Jan. 14, 2026).
[104] Ohio Rev. Code Ann. § 1521.23
[105] *Consumptive Use Permit*, ODNR https://dam.assets.ohio.gov/image/upload/ohiodnr.gov/documents/water/WIPP/CU%20FAQ.pdf (last visited Jan. 14, 2026).

permitting requirements under ORC § 1521.23 even when withdrawing more than two million gallons per day, limiting the reach of Ohio's only proactive water-use oversight mechanism.[106]

Collectively, ODNR's registration, reporting, and permitting requirements create only a narrow framework for overseeing water withdrawals and use in Ohio. The registration and reporting program serves only as an informational tool rather than a resource protection mechanism and the permitting program applies only to a select few withdrawal and consumptive use facilities. Not only do these programs lack meaningful oversight, but they apply only to facilities that physically withdraw water, leaving end-users who purchase water from municipal systems entirely outside the framework and creating a significant blind spot in state-level oversight.

C. *The Municipal Supply Loophole*

More than 97% of data centers obtain their water from a municipal water provider, shielding them from state oversight under Ohio's current common law and statutory framework.[107] Because data centers are not physically withdrawing water, they fall entirely outside the common law doctrine of reasonable use. For the same reason, they also escape all registration, reporting, and permitting requirements.[108]

By purchasing water from municipal suppliers, data centers effectively evade Ohio's reasonable use doctrine, which only governs facilities who physically withdraw surface water or groundwater.[109] Instead, any legal scrutiny is directed solely at the municipal supplier.[110] This

[106] Ohio Rev. Code Ann. § 1521.23
[107] Kendall Crawford, *supra* note 10.
[108] Helena Volzer, *supra* note 35 at 38.
[109] *See* Cline v. Am. Aggregates Corp., 15 Ohio St. 3d 384 (1984).
[110] Canton v. Shock, 66 Ohio St. 19, 20 (1902) (explaining that a municipality has a right to supply water to manufactories).

structural disconnect severs the link between the data centers whose activities drive increased demand and the legal standard intended to balance competing water uses.

Likewise, ODNR's registration and reporting requirements also only apply to facilities that physically withdraw surface water or groundwater.[111] As such, data centers are not required to disclose their water use and it is the municipality that is obligated to track and report water use.[112] In fact, less than one-third of data centers track their water use at all.[113] This critically obscures water use data as it makes public water supply appear to be the largest consumptive use of water.[114] However, in reality, that metric includes both public and industry use but it is impossible to know how much is truly public and how much is industrial use.[115] Data centers also evade ODNR's withdrawal and consumptive use permitting requirements, which apply only to a narrow subset of facilities physically withdrawing surface water and groundwater.[116] The scope of ODNR's permitting requirements are so narrow that even the municipal suppliers are exempt under these rules.[117]

The municipal supply loophole effectively insulates data centers from any direct accountability for their water consumption. This loophole presents a two-fold problem. First, under its existing framework, Ohio lacks ability to implement proactive standards or restrictions on data center water use. Second, without user-level tracking and reporting requirements, the state lacks the information necessary to understand the industry's cumulative water demands—

[111] *Water Withdrawal Facilities Registration*, *supra* note 69; Ohio Rev. Code Ann. § 1521.17
[112] Helena Volzer, *supra* note 35 at 20.
[113] *Id.*
[114] *Id.*
[115] *Id.*
[116] *Water Use & Management*, *supra* note 101.
[117] Ohio Rev. Code Ann. § 1521.23.

knowledge that is essential to evaluating, managing, and planning for the data center industry's rapidly expanding water demand.

D. *One-Sided Oversight: Water Discharge vs. Water Use*

Although Ohio lacks any mechanism for tracking or regulating water use by data centers, the state has recently proposed a state-wide permit for direct wastewater discharges—the end result of the water use.[118] In late 2025, Ohio EPA issued a draft general permit that covers both wastewater and stormwater discharges from data centers.[119] Specifically, the permit only covers data centers that discharge directly to waters of the state as opposed to public wastewater treatment facilities (a distinction that once again reflects the municipal supply loophole).[120] These discharges include non-contact cooling water, low volume wastewaters such as cooling tower blowdown, and stormwater discharging from the site.[121] For wastewater discharges, the permit proposes discharge limits and monitoring requirements for specific parameters.[122] Notably, it also includes monitoring requirements for daily discharge flow rates which must be reported to Ohio EPA in a monthly discharge monitoring report.[123] Of course, the discharge flow rate is not representative of the data center's water use since evaporative cooling causes about 80% of the facility's water use to evaporate.[124] However, if the state can require data centers to

---

[118] *Wastewater and Stormwater Discharges from Data Centers – General Permit*, OEPA https://epa.ohio.gov/divisions-and-offices/surface-water/permitting/wastewater-discharges-from-data-centers--general-permit (last visited Jan. 21, 2026).
[119] *Id.*
[120] *Id.*
[121] *Id.*
[122] Ohio Envtl. Prot. Agency, *General Permit Authorization for Discharges from Data Center Facilities*, 8 https://dam.assets.ohio.gov/image/upload/epa.ohio.gov/Portals/35/permits/Data_Centers/OHD000001_Draft.pdf (last visited Jan. 21, 2026).
[123] *Id.*
[124] Miguel Yañez-Barnuevo, *supra* note 43.

track and report the volume of water they discharge, it should be able to just as readily require comparable tracking and reporting of the volumes of incoming water.

To be clear, Ohio EPA's proposed general permit appropriately addresses water quality impacts within the agency's statutory authority.[125] The problem lies not with discharge permitting itself, but with the absence of a parallel mechanism to understand or manage the far greater volumes of water consumed upstream. Neither Ohio EPA nor ODNR currently have statutory authority to mandate water use reporting or implement technology-based standards for data center cooling systems, leaving water use entirely outside the scope of their existing regulatory reach.[126]

Ohio's proposed general permit nevertheless represents an important development: it formally recognizes data centers as a distinct industrial category and reflects the state's growing recognition that their rapid expansion poses significant environmental impacts. However, by regulating outputs without understanding or managing inputs, the permit puts the cart before the horse. Water use and water discharge are two sides of the same process that should be considered collectively. The amount of water used is dependent on the cooling technology utilized and ultimately impacts both the volume and quality of the water discharged. Therefore, it makes little sense to regulate only the discharge of water while leaving the intake of water entirely unexamined.

[125] *See* Ohio Rev. Code Ann. § 6111.03 (authorizing Ohio EPA to regulate and issue permits for discharge of pollutants into waters of the state).
[126] *See* Ohio Rev. Code Ann. § 1521.16 (granting ODNR oversight over water withdrawals but not use); *see also* Ohio Rev. Code Ann. 6111 (granting Ohio EPA authority to regulate discharges).

III. THE CASE FOR TRANSPARENCY AND WATER-USE PERFORMANCE STANDARDS

Supporting the continued expansion of Ohio's data center industry requires confronting the challenge of safeguarding the water supplies on which it and Ohio's communities depend. Accordingly, Ohio must adopt a regulatory approach capable of accommodating data center growth while protecting the state's finite water resources. To do this, Ohio must first implement requirements for data centers to track and report water use to provide regulators with a baseline understanding of the sector's cumulative water demand. With this information, regulators can utilize key factors to guide the development of water use performance standards for data centers. Because neither Ohio EPA nor ODNR currently have statutory authority enact such requirements, achieving these reforms will require action by the state legislature.

Other states have already begun moving toward the kind of water use reporting and technology-based requirements that Ohio should now pursue. In 2025, Illinois, having the fourth highest number of data centers in the U.S., introduced the Illinois Data Center Energy and Water Reporting Act, which would require data centers to annually report their energy and water consumption to the Illinois Power Agency.[127] Likewise, Utah, one of the driest states in the U.S., has proposed similar legislation requiring data centers to report the amount of water they divert, use, discharge, and reuse.[128] Wisconsin has gone even further, introducing a bill that would not only require data centers to annually report water use to the Department of Natural Resources, but also mandate the use of closed-loop cooling systems to limit water use.[129] These proposals

[127] S.B. 2181, 104th Gen. Assemb., Reg. Sess. (Ill. 2025); *USA Data Centers*, *supra* note 11.
[128] H.B. 76, 2026 Gen. Sess. (Utah 2026); *Driest States in the US 2026*, WORLD POPULATION REV. https://worldpopulationreview.com/state-rankings/driest-states (last visited Jan. 22, 2026).
[129] A.B. 840, 2025-2026 Leg., Reg. Sess. (Wis. 2025).

reflect an emerging policy shift toward water use transparency and, in some cases, technology-based requirements for data centers.

A. *Mandatory Water-Use Transparency as a Foundation*

Without adequate information on the water demands of the data center industry (or any water-intensive industry for that matter) Ohio lacks the capacity to meaningfully assess, manage, or plan for the cumulative impacts of large-scale water consumption.[130] User-level accounting and reporting requirements are therefore necessary to guide informed decision-making and protect water resources.[131] Accordingly, Ohio should require all significant water users, not just facilities that physically withdraw water, to track and report their water use volumes to the ODNR. This could be achieved by expanding ODNR's existing registration and reporting program to include facilities capable of *using* more than 100,000 gallons of water on a daily basis rather than limiting registration and reporting obligations to facilities capable of *withdrawing* such significant volumes.[132]

While mandatory registration and reporting requirements would establish visibility into the data center industry's water demands, transparency alone does not ensure long-term protection of valuable water resources. Its value lies in enabling regulators to identify trends, benchmark performance, and implement forward-looking standards that align water demands with regional availability and technological feasibility.

B. *Water Use Performance Standards for Data Centers*

[130] Helena Volzer, *supra* note 35 at 37.
[131] *Id.*
[132] Ohio Rev. Code Ann. § 1521.17.

While transparency alone cannot protect water resources, dependable water use data would equip regulators with the necessary knowledge to implement performance standards capable of both preserving water supplies and supporting the continued expansion of data centers and other industries. A regulatory framework that couples reporting with measurable expectations for water use efficiency would allow Ohio to manage rising data center demand while preserving the state's water resources. Three components form such framework: (1) a standardized water-efficiency metric; (2) a risk-tiered structure based on regional water availability; and (3) technology-based requirements for facilities operating in high-risk areas or using water-intensive processes.

1. *Water Use Effectiveness*

A central element to a water use performance standard would be a consistent metric for evaluating water efficiency across the entire data center industry. Luckily, the data center industry has already established one—Water Use Effectiveness (WUE).[133] WUE measures how efficiently water is used by comparing the amount of water consumed by a data center to the energy consumed by its IT equipment, expressed in units of liters per kilowatt hour.[134] Some larger data center companies, like Microsoft, Meta, and Amazon Web Services, already track WUE as part of their internal sustainability programs.[135] Currently, the average WUE across data centers is estimated at 1.8 L/kwh.[136] However, given that less than one-third of data centers

[133] Christopher Tozzi, *supra* note 38.
[134] *Id.*
[135] *See Measuring Datacenter Energy and Water Use to Improve Microsoft Cloud Sustainability*, MICROSOFT https://datacenters.microsoft.com/sustainability/efficiency/ (last visited Jan. 23, 2026); *see 2025 Sustainability Report*, META https://sustainability.atmeta.com/wp-content/uploads/2025/10/Meta_2025-Environmental-Data-Index.pdf (last visited Jan. 23, 2026); *see Sustainability*, AMAZON https://sustainability.aboutamazon.com/products-services/aws-cloud#water-positive (last visited Jan. 23, 2026).
[136] Christopher Tozzi, *supra* note 38.

actually track their water use, this estimate is based on limited voluntary reporting and not entirely representative.[137]

Incorporating WUE into Ohio's regulatory framework would provide a uniform benchmark to evaluate data centers against. Furthermore, because WUE scales water consumption to energy consumption, it avoids penalizing facilities solely for size and focuses instead on efficiency. This makes it an ideal metric for water use performance standards because it encourages the adoption of less water-intensive cooling systems without constraining data center growth.

2. *Consideration for Regional Water Stress*

Water use performance standards must also reflect the reality that water availability varies by region.[138] To address this, regulators should adopt a risk-tiered structure. This can be accomplished through use of tools such as the World Resource Institute's (WRI) Aqueduct Water Risk Atlas.[139] With the Water Risk Atlas, regulators can assess water stress across the state. According to WRI, its water stress map indicates levels of water stress based on the ratio of total water demand to available renewable surface and groundwater supply.[140] Using this data, regulators can establish a risk-tiered structure where data centers located in low-risk areas could be subject to more flexible WUE standards or technology-based requirements while those in higher risk areas could be subject to stricter standards and requirements.

[137] Helena Volzer, *supra* note 35 at 20.
[138] *Water Risk Atlas*, AQUEDUCT https://www.wri.org/aqueduct (last visited Jan. 17, 2026).
[139] *See Id.*
[140] *Id.*

A risk-tiered performance standard would help ensure that water-intensive operations are constrained where water resources are most vulnerable. Central Ohio illustrates why such an approach is necessary. Nearly 58% of the state's data centers are concentrated in this region, and the Water Risk Atlas also indicates a medium-high level of water stress for the region.[141] This data aligns with the 2025 regional water study projecting significant water supply gaps by 2040 in Central Ohio without meaningful action to better manage and plan for rising industrial demand.[142] A risk-tiered performance standard would direct the strongest protections to regions, such as Central Ohio, where water stress and demand pressures are greatest.

3. *Technology-Based Requirements*

In addition to the water use effectiveness metric and a risk-tiered structure, Ohio's water use performance standards should incorporate technology-based requirements for data centers located in higher water stress regions. With a data center's direct water use footprint largely dependent on the type of cooling technology it utilizes, traditional air cooling systems are water-intensive as they typically use evaporative systems to chill the air used to cool the server room.[143] These types of cooling systems are often favored because they are simple, have low initial installation costs, and are relatively energy efficient.[144] By contrast, new cooling technologies such as liquid cooling remove heat more efficiently than air cooling, uses up to 90% less water, and is relatively energy efficient.[145] Some larger companies, such as Microsoft, Google, and Amazon Web Services, have already begun investing in liquid cooling

[141] *Id.*; *USA Data Centers*, *supra* note 11.
[142] *Central Ohio Regional Water Study*, *supra* note 13 at 32.
[143] *See Calculating the Impact of Water Usage on Data Center Costs and Sustainability*, *supra* note 37.; *Cooling Water Efficiency Opportunities for Federal Data Centers*, *supra* note 41.
[144] Christopher Tozzi, *supra* note 38.
[145] *Id.*; SRC Evalmetrics, *supra* note 12 at 6.

technology.[146] However, liquid cooling systems have not yet been widely adopted because they require specialized equipment, resulting in a much higher upfront installation cost and requiring skilled personnel for maintenance and upkeep.[147]

Given these differences, Ohio should incorporate technology-based requirements into its water use performance standards, requiring data centers in higher water stress regions to utilize less water-intensive cooling technology such as liquid cooling. Data centers in lower water stress regions could retain greater flexibility in their choice of cooling technologies as long as they meet state-established WUE thresholds. This approach preserves flexibility where water resources are more abundant but ensures that the more water-intensive cooling technologies are phased out where they pose the greatest strain on local water resources.

Together, WUE, regional water-risk tiering, and technology-based requirements form a regulatory framework that is both adaptable and enforceable. This integrated approach allows Ohio to regulate data center water use in a manner that is responsive to local conditions, grounded in industry-standard metrics, and aligned with available technologies. By tying cooling technology obligations to measurable water stress indicators and WUE performance metrics, regulators can encourage innovation, reduce consumptive water use, and promote long-term protection of water resources without imposing a one-size-fits-all mandate.

CONCLUSION

Data centers have become an indispensable part of modern life and, as AI accelerates their expansion across the state, the water demands required to sustain this digital infrastructure

---

[146] Aashi Mishra, *Liquid Cooling: The Sustainable Solution Driving Efficiency in Data Centers*, DATA CENTER KNOWLEDGE (Oct. 28, 2024), https://www.datacenterknowledge.com/cooling/liquid-cooling-the-sustainable-solution-driving-efficiency-in-data-centers.
[147] Christopher Tozzi, *supra* note 38.

are rising just as rapidly. Supporting the continued growth therefore requires confronting the challenge of safeguarding the water resources on which both data centers and our communities depend. Yet Ohio's existing common law reasonable use doctrine and narrow withdrawal-based registration and reporting requirements leave regulators without the information or tools necessary to understand, let alone manage, the cumulative impacts of the rapidly growing industry. Because neither Ohio EPA nor ODNR currently have statutory authority to regulate data center water use, this regulatory gap will persist, absent legislative action.

Ohio should require all significant water users, not just facilities that physically withdraw water, to track and report their water use volumes. Mandatory water use tracking and reporting by large end users, including data centers, is the necessary foundation for informed water resource protection. Without reliable user-level data, regulators cannot assess cumulative demand or design regulations that balance economic growth with long-term protection of water resources. Transparency alone does not ensure sustainable outcomes, but it enables regulators to identify trends, benchmark performance, and implement forward-looking standards. Establishing this baseline is therefore an essential first step toward any meaningful statewide technology-based standard.

Building on this foundation, Ohio should also adopt water use performance standards built around water use effectiveness metrics, regional water stress indicators, and technology-based requirements. Such framework moves the state from a purely reactive posture toward a proactive system that preserves flexibility, encourages innovation, reduces consumptive water use, and protects vulnerable water resources without imposing a one-size-fits-all mandate. Properly designed transparency and performance standards would position Ohio to sustain data

center growth without compromising the water resources on which it and our communities depend.