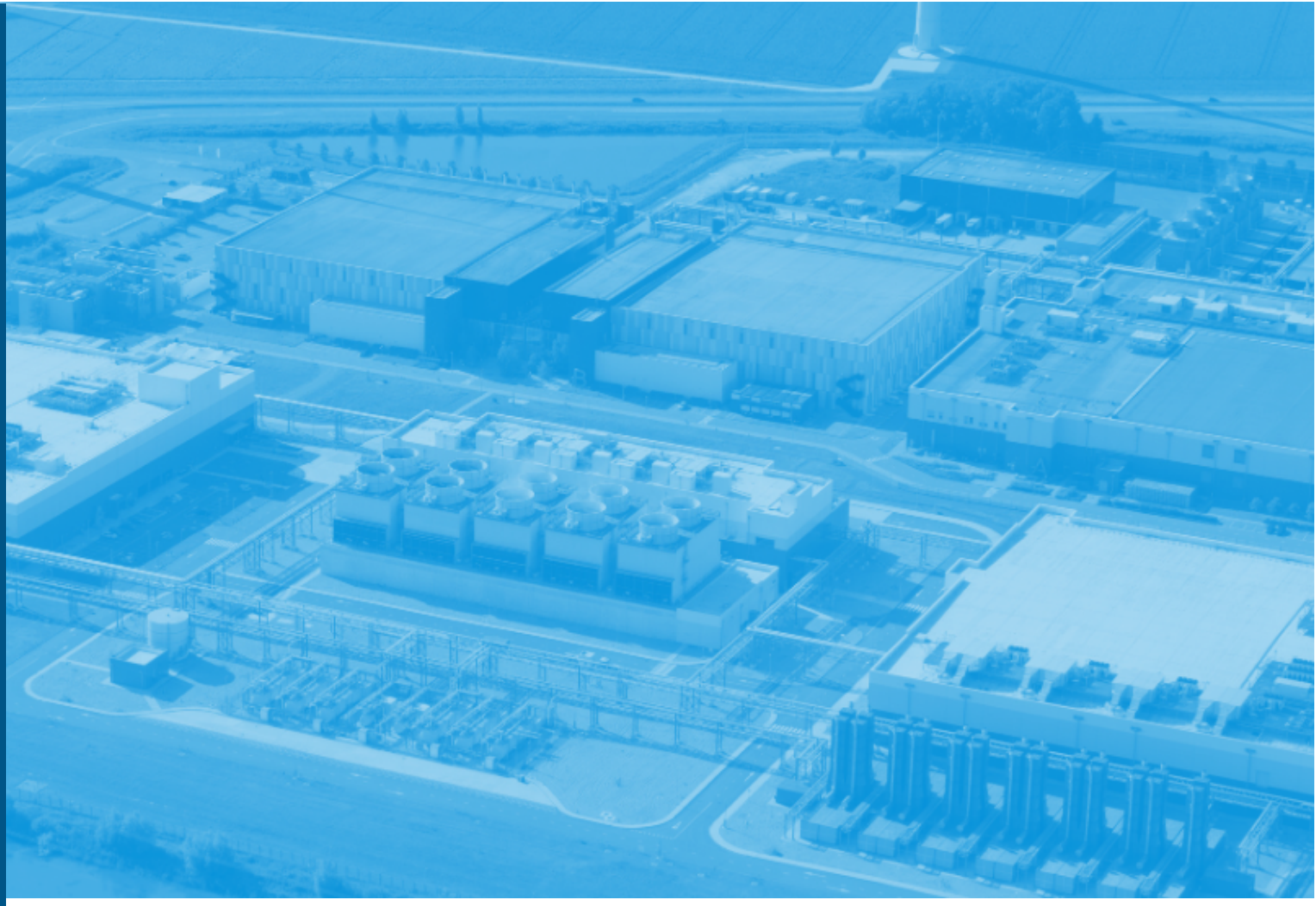

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Data Centers: A Guide for Clean Water Utility Executives

NACWA

Acknowledgements

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Introduction

In the midst of the global artificial intelligence (AI) race, water availability and environmental sustainability have become material considerations for hyperscale and other large data center development across the United States. As a result, clean water utility leaders are called to manage an increasing array of challenges and opportunities for their communities.

Access to dependable and sustainable water supplies—whether potable water, reclaimed water, or alternative sources—can highly influence data center project feasibility, regulatory approvals, capital and operating costs, and operational reliability. Reclaimed water is not only a potential solution for cooling water needs, but a preferred option under the water stewardship and sustainability programs of major data center owners, and potentially beneficial to the utility as well (*e.g.*, reduction of nutrient discharge).

For host communities and their water and wastewater utilities, large water demands can create challenges related to source water availability, treatment plant capacity and compliance, pipe system capacity (transmission, distribution, and collection), related capital and operations expenses and associated user rates, and surface water quality and quantity.

Utilities, whether a combined water and wastewater utility or a wastewater-only utility, will be more successful in managing data center-related issues by planning and engaging early – with a "One Water" philosophy – preferably long before data center recruitment, service inquiries, project siting, and development. There are several reasons this is especially important in the data center context:

- Water and wastewater capacity decisions often influence data center site selection.
- Significant infrastructure capacity may need to be constructed to meet peak cooling water demands and to convey and treat peak wastewater discharges.
- Utility infrastructure lead times may exceed data center development schedules.
- Reclaimed water opportunities may be lost if utilities are not engaged early.
- Existing utility rates and charges may need review and refinement to ensure full cost recovery and proper ratepayer protection.
- Water stewardship commitments may be more beneficial when negotiated in coordination with economic incentive agreements and land use approvals.

This guide provides a high-level overview of clean water utility considerations for serving data center development. It highlights ***interests*** that leaders may wish to evaluate from a utility perspective, secure by advance policymaking, or negotiate during the development process, as appropriate, such as water supply availability (reclaimed water production), utility requirements tied to site selection (reclaimed water transmission and wastewater collection infrastructure), wastewater management (treatment and any appropriate pretreatment), and financial elements such as cost recovery, rate design, and affordability implications for the utility's other customers. The

guide also offers ***insights*** for participating effectively in negotiations, including pre-proposal and post-proposal decision-making processes, to improve community and utility outcomes and secure enforceable water commitments that are appropriate for data center development and operations. Please note that while this guide raises a number of legal issues, it should not be construed as legal advice and does not replace the need for and benefit of independent legal evaluation and advice in individual circumstances.

Key Participants In The Data Center Development Process

For clean water utilities to serve new data center customers fairly and appropriately while also protecting and benefitting existing and other future customers, it is essential to have a voice in all venues where decisions are being made with implications for utility assets, operations, customers, and water resources. The "public" nature of NACWA's member utilities brings an important voice to the table with interests that could otherwise be overlooked and neglected in the rush to get new data centers up and running. Getting a seat at the table may be easier said than done but is vital. Success can depend significantly on developing and maintaining strong working relationships and effective coordination with other governmental authorities with jurisdiction over aspects of data center projects.

From a utility perspective, the availability of electric power has long been a critical consideration in data center siting and will continue to be so. With increasing power supply challenges – and the electrical demand tradeoffs between water and non-water dependent cooling technologies – clean water utilities are more frequently in the mix of essential early players (or should be) given their responsibilities. While the players and the process vary locally and can look much different depending on whether the clean water utility is organized as a department within the host local government or as a separate local or regional entity, the roles and responsibilities of the utility typically include:

- Water (potable or reclaimed) capacity allocators for communities and projects;
- Wastewater collection and treatment system developers, owners, and operators;
- Reclaimed water production and distribution system developers, owners, and operators;
- Regulated entities (potable water supply, treatment, and distribution systems; and wastewater collection and treatment, industrial pretreatment administration, and effluent discharge or reuse); and
- Service providers setting rates and charges for all customers (either with or without State or local government oversight depending on jurisdiction).

Timely integration of these roles and responsibilities are critical for achieving optimum outcomes for the community, including existing customers as well as the data center developer. To that end, collaboration is the key to success. The clean water utility should be engaged early not only with

the developer but with all the key players making decisions with implications for water-related interests, as discussed below.

Local Governing Bodies & Their Planning / Zoning Officials

Whether the clean water utility is part of the local government or a separate entity, zoning and land use approvals often effectively commit the utility to serving the project, which underscores the need for utility coordination before approvals are granted. The early entitlement phase is usually the best opportunity to work with the data center developer to secure appropriate water commitments, which might range from funding reclaimed water system development or other appropriate system investments, conservation measures, or collaboration on local water quality efforts. Localities that adopt conditional land use approval systems, in contrast to by-right zoning ordinances, at least for data centers or similar large industrial or commercial large water uses, have better built-in opportunities to shape win-win outcomes.

Whatever type of land use regulation system is in place, few major developments are without their detractors, and it is the local elected officials, chief administrative officers, and/or local planning officials who tend to be the focus of public inquiries or opposition. Data centers often trigger enthusiastic interest from stakeholders. Utilities may need to go beyond simply addressing technical issues in developing strategies and community messaging. The clean water utility that is engaged early can best help these officials be responsive to public inquiries, support public engagement and participation in the community, and minimize misunderstandings about water resources and utility issues.

Economic Development Authorities & Officials

With responsibilities for marketing sites, recruiting development projects, and structuring deals, these entities often control early project information and incentives. Utilities should establish or maintain good lines of communication and coordination protocols. Utilities that provide clear, site-specific water availability and cost information in advance can help win desired projects and avoid wasted time and effort on infeasible projects. Water and wastewater services are not only essential to project success, but sometimes part of incentive packages. The needs of economic development prospects should be evaluated with careful consideration of proper cost recovery, customer equity, and community benefits.

Community Members Including Neighbors & Non-Governmental Stakeholders

Nearby residents, community organizations, and environmental advocacy groups play an important role in shaping the public narrative and perception. These stakeholders are often interested in a range of impacts such as noise, air emissions, water impacts, and utility rates. Their perspectives can influence elected officials, permitting authorities, and project timelines, conditions, and viability. Like developers and host localities, clean water utilities should anticipate public interest and the need for tailored outreach efforts—such as public meetings, targeted

briefings, and accessible informational materials—that address local concerns and explain water use, mitigation measures, and community benefits. Thoughtful engagement can help build public trust in the utility; however, there can be tension between the desire of utilities to engage and the nondisclosure requirements often required by major economic development prospects.

State Policymakers & Regulators

Early and sustained engagement with state policymakers and regulatory agencies may be helpful for aligning sound wastewater management strategies with evolving legal and regulatory frameworks for data center development, which can be welcomed in some places or disfavored in others. Key areas for coordination may include the following.

Legislation – State legislatures may shape the operating environment for large water users through statutory requirements, incentives, or constraints. These may include policies promoting water efficiency, reuse, or industrial recruitment, as well as funding mechanisms or tax incentives tied to data center or water infrastructure development. Monitoring and, where appropriate, engaging in legislative processes can help utilities anticipate changes and ensure that statutory frameworks support practical, cost-effective utility solutions that benefit the community.

Environmental Regulation – Regulatory agencies typically have oversight responsibilities for water quantity and water quality, including permitting and compliance associated with withdrawals, treatment, reuse, recharge, and discharge. Requirements in these areas can materially affect project feasibility, design, and cost. Early dialogue with regulators can help clarify applicable reuse standards, permitting pathways, and project timelines, as well as identify opportunities for flexibility or pilot approaches—particularly where innovative reuse, beneficial use, or alternative discharge strategies are being considered. Proactive engagement may also surface opportunities to align with broader state water management goals, such as aquifer or streamflow protection, drought resilience, or surface water quality efforts.

Rate Oversight – In states where publicly-owned wastewater utilities are subject to state-level rate review or approval, coordination with oversight bodies is important to ensure that proposed rate structures, cost allocations, and cost recovery mechanisms are understood and supported. This can be particularly significant for data center projects that may introduce large, concentrated demands or require capital investments that differ from traditional utility system development patterns. Early engagement can help mitigate regulatory risk, support transparent rate design, and facilitate timely approval of rates and charges that appropriately allocate costs while maintaining equitable treatment of existing customers.

Water Reuse & Other Water Stewardship Opportunities

As water supply challenges and public interest in water-related impacts of data centers have increased, the industry has responded by adopting policies intended to mitigate water impacts. Major data center owners have adopted water stewardship goals as part of their sustainability programs.

These initiatives generally seek to move beyond simply reducing facility water consumption. Aims may include being "water positive" (returning more water to the watershed than consumed for a net volumetric benefit) or "pipe neutral" (ensuring data center demand does not reduce existing system capacity available to community users). Specific targets and methodologies vary by company. The voluntary nature of these corporate sustainability efforts brings the opportunity to devise win-win projects tailored to the needs of the host community and other legitimate interests.

Reuse of reclaimed water is a common strategy, along with improving water cooling system efficiency and implementing various other projects that benefit utilities, host communities, and the environment. The broad range of projects that have been reported means that there is significant room to develop community and project-specific win-win outcomes. Examples range from water conservation through leak detection and repair; to landscape design and irrigation reduction incentives; to aquifer recharge and other water replenishment projects; and to watershed restoration and other water quality projects.

With this data center industry background in mind, this guide next turns to ideas on how clean water utilities can help set their communities up for success through policy-making and planning ***before*** addressing individual data center development proposals.

Pre-Project Phase Considerations

For any potential future host community, there can be major benefits to reviewing local land use and utility plans and requirements for their sufficiency toward promoting good outcomes in the context of major data center development. Given typical complexities, coordination, and required processes, this is easier said than done. But the alternatives are missed opportunities and suboptimal or even negative outcomes, so it can be well worth the effort.

Land Use Planning & Requirements

The local land use approval stage is a critical—often the most consequential—phase in the development of a data center project because it is the point at which communities define whether, where, and under what conditions these facilities can be developed. How this works depends on local zoning regulations, especially whether data centers are permitted "by-right" or require a case-

by-case approval process often referred to as "conditional use" permitting or "special use" permitting.

In practice, zoning and land use approval procedures determine the extent to which local authorities can align projects with community priorities or must instead react to development proposals under more constrained authority. A by-right land use framework generally limits the community's ability to tailor conditions, whereas a conditional land use process better enables a project-specific evaluation of impacts and enforceable mitigation measures on a case-by-case basis.

This stage also serves as the primary forum for evaluating whether a data center is an appropriate "fit" for the host community—whether urban, suburban, or rural—and, if not inherently compatible, whether the project can be made so through thoughtful siting, design, mitigation, and operational conditions. Land use review is where issues such as scale, buffering, noise, visual impacts, and compatibility with surrounding uses are examined alongside broader community objectives.

The land use approval stage is decisive because it is closely tied to the vesting of development rights. Once a project secures zoning and begins to vest, the locality's ability to revisit key issues or require additional appropriate mitigation may be substantially reduced. As a result, this is often the preferred stage to negotiate reasonable conditions or proffers that address infrastructure costs, utility system upgrades, water reuse or conservation measures, and other community impacts. If these issues are not fully addressed on the front end, increased burdens may later fall, for example, on utilities and other ratepayers for infrastructure improvements or on the locality in the form of constrained growth options.

Utility Facility Plans & Requirements

To support local land use plans, most utilities will have a systemwide plan often referred to as a utility master plan or facilities plan. Utility plans may need to evolve to explicitly anticipate and manage the unique characteristics of data center water demands—large, concentrated, and uncertain demands that can drive major infrastructure needs. This requires scenario-based forecasting, site-specific capacity analysis, integrated potable and reclaimed water supply strategies, and policies for infrastructure phasing, cost recovery, and water efficiency.

Equally important, utility planning should be coordinated with land use and economic development processes to guide high-demand users to suitable locations and secure necessary infrastructure investments by enforceable commitments. Without these elements, utilities risk reactive expansion, cost shifting to existing customers that may exacerbate existing affordability challenges, and constraints on long-term community growth.

Given high interest in reclaimed water, utility plans should evaluate where reclaimed water could be supplied and in what quantities, either currently, over a short timeline, or on a longer timeline. With data center developers motivated to move rapidly from scoping to start up, it is beneficial if utilities have already begun the planning to be able to develop win-win solutions for future projects. It is also beneficial to characterize reclaimed water quality in advance, as this is a consideration for cooling equipment and materials selection, maintenance, and life span.

Utilities should not assume that reclaimed water opportunities are lost simply because reclaimed water infrastructure cannot be delivered within the developer's desired project schedule. In some cases, mutually beneficial agreements may allow initial service using potable water while requiring the data center to be designed for a future transition to reclaimed water. This approach can align utility infrastructure development schedules with data center construction timelines while preserving and achieving long-term water stewardship opportunities.

Other utility related policies for managing the operational and regulatory characteristics of large water users such as data centers may be addressed upfront in local ordinances or regulations. These may include:

- Defining acceptable ranges of water use intensity and implications of different cooling technologies. One key issue for some utilities may be whether highly consumptive evaporative systems with significant losses are appropriate within the utility's service area or should be limited to specific service area locations, be subject to certain conditions, or not be utilized due to overriding local considerations.

- Charging adequate capital recovery fees and user rates to recover the cost of serving high volume users. For example, some common methodologies might under-recover true costs of service for customers with high peak demands relative to normal use. Attention should be applied to comparing the rates and volumes of water used by different customer classifications to set rates and charges fairly and avoid unintentionally shifting the cost of commercial and industrial users to residential users. In addition, the risk of stranded utility assets and lost revenue from closure of the data center or simply reduction in demand in the future needs to be factored as well.

- Incorporating large users into drought planning by establishing clear expectations for demand reductions, including tiered curtailment measures or interruptible service provisions, where appropriate. Embedding these policies in applicable utility ordinances or regulations facilitates their consistent application rather than negotiating them ad hoc for individual projects.

Lastly, there may be valuable co-benefits to clean water utilities that could justify utility investment in reclaimed water system development for data centers with water-dependent cooling systems. For example, in areas with nutrient-related water quality-based effluent limitations under Clean Water Act TMDLs or other state-specific requirements, consumptive use can help minimize effluent nutrient loads discharged to receiving waters and potentially avoid or minimize additional nutrient removal technology capital or operational expenses.

Project Evaluation Phase Considerations

To work effectively with prospective data center customers and with various other stakeholders, utilities should consider the following factors or requirements. Many of these items may be needed not only for understanding and evaluating proposals, but ultimately for structuring win-win agreements for the prospective customer and the clean water utility (and the community it serves). Many of these items may be appropriate for various contracts, from an initial term sheet to an overall development agreement with water and wastewater elements to a standalone utility services agreement.

Confidentiality & Transparency

Confidentiality is a familiar issue in economic development, but opposition to large data centers has brought extra focus to this issue. Data center developers view facility design and water usage information as proprietary and routinely seek protection through nondisclosure agreements (NDAs). The permissible scope and limitations of NDAs versus the extent of the legal rights of the public to access information in the possession of the government varies under the sunshine laws of different states. Of course, confidentiality and public information access are not only legal issues, but considerations that inherently tie in with community relations and public trust, so they warrant particularly careful management.

Water Demands & Infrastructure Capacity

Cooling Technology – Water demands are tied heavily to cooling technology selection, which also depends heavily on the availability of electric power supply. Generally speaking, water-dependent cooling is more efficient and uses less energy, while air cooling and other technologies use less water but more electricity.

Peak Demand – For data center water demand evaluation, careful attention should be given to ascertaining peak demand requirements (instantaneous peak and maximum day) and seasonal fluctuations in addition to long-term average use. Specific provisions in applicable agreements should govern not only infrastructure sizing for peak demands and cost recovery, but conditions and limitations on the actual use of the water and wastewater systems by the customer to ensure adherence to planning assumptions.

Independent Validation – Independent efforts to verify the reasonableness of water demand projections is recommended. Projected water demands presented during site selection and development negotiations are often based on planning assumptions, which may differ materially from actual operating conditions after buildout and occupancy (sometimes much lower).

Available Capacity & Needed Improvements – With accurate information on water demands, utilities can model and assess available capacity to serve the proposed project at one or more alternative sites in or near the utility's service area with potable or reclaimed water and with wastewater collection and treatment. Needed system improvements may include treatment expansion (water plant capacity) or upgrades (wastewater treatment processes to meet applicable reclaimed water standards and any data center-specific water quality requirements), transmission,

distribution, and collection system piping, pump stations, in-system storage (in lieu of or in addition to on-site water storage), and meters.

Water Storage – Utilities and data center developers often find it advantageous to incorporate water storage, in the utility system or at the data center site, to mitigate the effects of peak data center water demands on the sizing and operation of the potable or reclaimed water system and to facilitate compliance with design assumptions and related contractual requirements limiting utility system use consistent with those assumptions.

Construction Timelines – Timing of construction, start-up, and ramp-up of water demands is of course integral to the capacity evaluation. Accurate construction schedules with clear timelines for increasing water uses and discharges over time (*e.g.*, as multiple buildings are constructed in sequence on a data center campus) are important for assessing the ability to serve.

Phased Supply Strategies – Utilities and data center customers may benefit from phased water supply strategies making initial use of potable water while requiring facilities to be designed and constructed for future conversion to reclaimed water service as utility infrastructure becomes available. This may include dual plumbing systems, space reservations for future connections and treatment equipment, and other measures that minimize future retrofit costs and operational disruptions.

Capacity Reservations – Attention should be given to the nature of water supply commitments by the utility to the data center developer. Key issues may include whether the utility has a general duty to serve new customers or more discretion; whether the utility allocates capacity on a first come first served basis or reserves capacity on some basis; when and how utility capacity is actually reserved for a project; and who (as between the utility and the customer) controls reserved capacity to the extent it is unused by the customer at the site in question.

Transferability of Water Supply Commitments – Utilities should consider whether to allow reserved capacity to be transferrable by the original developer of the site to another party or even another location. It may be appropriate for the utility to require its approval to transfer capacity reservations. Transactions may trigger new or different requirements by the acquiring party for which an approval process may help maintain an appropriate balance and give-and-take as earlier assumptions and compromises are revisited to address changed circumstances.

Temporary Construction Period Demands – Not to be overlooked are construction period demands for activities such as dust suppression, concrete production, hydrostatic testing, and cooling system commissioning, as well as construction workforce sanitary needs. Temporary discharge management requirements may be appropriate.

Water Rights & Environmental Protection

Whether warranted or not, data centers as a class of customers are attracting significant scrutiny due to the prevalence of these projects in the AI boom. This means that otherwise familiar water rights frameworks and environmental protection requirements may draw extra attention or require enhanced compliance assurance efforts. For example, as data centers drive demand for reclaimed water, water reuse projects, though typically viewed as a positive environmentally, may be more

intensely evaluated or potentially limited by regulators based on water rights and stream flow reduction following reuse diversions for consumptive purposes. Similarly, drought management procedures or requirements may warrant advance attention given the nature of data centers as potentially high water users operating under near-perfect operational reliability expectations.

Data Center Discharge Water Quality

Discharges from data center commissioning and operational phases each may require project-specific oversight by the clean water utility. Appropriate requirements, whether established through agreements, permits, regulations, or ordinances, should be clearly communicated to the data center developer or owner and especially the construction and operations staff.

Start-Up Phase – Flushing newly constructed cooling systems should be carefully monitored and managed to avoid downstream wastewater treatment plant passthrough or interference. Metals, passivation chemicals, and high organic loadings from heat-conducting fluids such as glycol are common issues. Pre-flushing sampling and testing for utility review and approval prior to discharge should be considered to protect the treatment plant.

Operational Phase – Periodic discharges of cooling system blowdown to control mineral buildup, scaling, corrosion, and water quality may contain elevated concentrations of dissolved solids or toxics that may cause wastewater treatment plant passthrough or interference and impact National Pollutant Discharge Elimination System (NPDES) permit compliance and receiving water quality. Again, appropriate monitoring and regulation of potential short-term, high volume slug loads should be considered. Of course, this oversight requires adequately trained utility staff. Increased operating expenses are typically recovered through appropriate fees, rates, or charges.

Water & Wastewater Operations Plan

Requiring the data center customer to have an operations plan may be a useful mechanism for compiling and effectively managing the numerous water supply and sewer use issues described above. Such a plan may include data center staffing levels, mutual points of contact, required water system procedures and limitations, required wastewater discharge procedures and limitations, emergency procedures, a commitment to an annual operations review meeting, and a process for the utility's review and approval of the initial operations plan and any future modifications, among other appropriate provisions.

Costs & Cost Recovery

The unique characteristics of data center operations described throughout this guide should also be considered in the context of financing agreements for data center-driven capital improvements and when setting rates and charges to properly recover the cost of serving the data center. As discussed above, data center water supply requirements will typically be driven more by peak-day or peak-hour demand than by annual water consumption. The utility may be required to construct significant infrastructure capacity to meet infrequent but exceptionally large demands associated

with hot-weather operations. Wastewater systems face similar issues due to low average daily use but substantially higher volumes from periodic blowdown and maintenance.

Water and wastewater costs should be properly allocated for the associated treatment, transmission, pumping, storage, collection, and other facilities required to provide reliable service during periods of maximum demand. Rates and charges should be evaluated for impacts on existing customer classes to ensure that infrastructure costs attributable to data center development are not inadvertently shifted to other utility customers under existing practices.

Capital cost recovery mechanisms should be implemented to account for the full cost of using existing infrastructure as well as new or expanded facilities constructed by the utility to meet the unique demands of the data center customer. Depending on the precise methodology used, some equivalent residential unit-based systems, for example, might under-recover true costs of service for data centers with high peak demands.

Operating expense recovery faces similar challenges such as recovery of utility costs associated with maintaining reserved capacity that is not used on a continuous basis. Typical volume-based user rates may not adequately recover actual maintenance expenses. Demand-based charges, minimum monthly charges, seasonal rates, or other rate mechanisms designed to recover the costs of maintaining infrastructure capacity needed to meet peak water demands may be more appropriate.

Lastly, consideration should be given to potentially stranded costs or assets. Risks range from the impact of project delays or cancellations to reduced water demand and utility revenue over time from lower water use (data center owners have sustainability goals which could significantly reduce their water demand) or closure of the facility.

Water Stewardship & Community Benefit Commitments

Data center developers and owners are cognizant of the benefits and impacts of data center development for host communities. Major data center owners have attempted to respond with various water stewardship programs and, at the project level, developers and owners have negotiated various voluntary investments in host communities. In the present AI boom, the industry is well-funded, and time-to-market is a predominant consideration. Beyond water reuse as discussed throughout this guide, some examples of potential collaborations include:

- Water quantity projects such as leak detection and repair, water replenishment, or provision of reclaimed water to other users to offset the data center's potable water use;
- Water quality projects such as watershed restoration, nutrient removal or other treatment upgrades, and other water quality projects;
- Water affordability initiatives such as household water assistance program funding;
- Water or wastewater system access improvements to private properties with contaminated groundwater wells or failing septic systems; and

- Air quality projects such as emissions reductions or air quality monitoring.

Risk Allocation

Given the near-perfect operational reliability goals of data centers and the inherent risks and challenges in operating a reclaimed water and wastewater utility, utilities should avoid taking on additional risks and liabilities associated with their own operational reliability. Consideration should be given to appropriately allocating risks to the developer and avoiding and disclaiming liabilities by the utility consistent with state and local law. Opportunities may be identified to reduce risks and increase certainty for the customer. Issues to consider include:

- Reclaimed water quality (treatment failure, backup potable water supply);
- Line breaks (redundant supply lines from different directions or backup supply wells);
- Drought management (supply shortages, regulatory curtailments);
- Legal/regulatory risk (changing laws, regulations, or permits affecting the utility or data center); and
- Term/termination (duration, delays, cancellations, reductions, closures, discharges).

Conclusion

We hope this guide provides helpful background and actionable insights for NACWA members. We envision this guide being a "living document" and intend to continue to refine these strategies and recommendations over time, including adding case studies as NACWA members gain more experience with the challenges, risks, and opportunities of data center expansion. Members should continue to share any comments on this guide and their experiences with data centers with Amanda Aspatore, NACWA's Chief Legal Officer, at AAspatore@nacwa.org.

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