STATE OF ILLINOIS
ILLINOIS COMMERCE COMMISSION

Illinois Commerce Commission	)	
On Its Own Motion	)	
	)	16-NOI-01
Notice of Inquiry Regarding the	)	
Regulatory Treatment of Cloud-	)	
Based Solutions	)	

JOINT RESPONSE OF ILLINOIS-AMERICAN WATER COMPANY AND AQUA ILLINOIS, INC. TO NOTICE OF INQUIRY

Illinois-American Water Company ("IAWC") and Aqua Illinois, Inc. ("Aqua") submit the following responses to the Notice of Inquiry of the Illinois Commerce Commission ("Commission") regarding the regulatory treatment of cloud-based solutions. IAWC and Aqua are referred to jointly hereinafter from time to time as the "Water Utilities".

Cloud vs. On-Premises IT Solutions:

A. Cost:

1. *Identify how costs differ between a traditional on-premises IT system and a cloud-based solution, including all relevant costs and timing of costs.*

The cost of each solution type would vary greatly depending on the project, service, and provider. And because the Water Utilities have not yet investigated and reviewed in depth the various cloud-based systems, we are not able to provide cost and timing estimates at this time.

2. Describe the costs associated with migrating utility data systems to cloud services. What evidence have stakeholders seen of this shift and what are the results? How long would it take to migrate utility data from on-premises IT to a cloud solution? Provide examples of utility services that have migrated from utility-owned systems to cloud services.

Please see response to Question A.1. Migration costs would vary greatly based on the cloud provider, the application/system in question, etc.

3. Identify costs associated with training employees to use cloud-based solutions and whether those costs differ substantially from costs to train employees to use utility-owned, on-premises systems.

Please see response to Question A.1. Furthermore, training costs would depend on which employees/users are involved. If it is purely the end user of the application/solution, then there should not be any cost difference to train them whether on-premises or in cloud. However, if it is the administrators and/or support teams of the application/solution, the costs could differ greatly.

4. Describe whether and how operations and maintenance costs differ between utility-owned, on-premises systems and cloud services.

Please see response to Question A.1. The operation and maintenance costs would vary depending on the project, the service, and the provider.

B. Reliability:

1. Describe whether and how cloud-based solutions improve safety and reliability at a utility.

Our comments will address reliability. For internally hosted systems, reliability needs to be built and managed constantly and considered all the way down to real estate plans. For Cloud providers (and not all of them are the same, but we'll assume top-tier providers like IBM, Amazon and Microsoft) reliability and redundancy is managed by the provider. Again, not all cloud providers are the same. At the end of the day, the discussion is more about the negotiated Service Level(s) versus Reliability versus Cost. Service Level breach penalties also need to be carefully looked at as they often do not come close to compensating for a loss of service. Reliability could be impacted, in a cloud solution, if there are no service levels in place around system upgrades and enhancements. A cloud provider could push upgrades that impact your

business or other business systems. The consumer should attempt to negotiate and control the upgrade and patch cycles.

2. Proven Cloud Technologies in Regulated Utilities

i. Identify the cloud services that have proven most successful for public utilities.

Some examples are: ESRI ArcGIS Online for geolocation services and sharing maps with outside entities; Fathom for unified AMI/AMR meter reading data that is rationalized before being consumed by a CRM system; CodeRed for customer notifications (flushing, boil orders, do not consume, etc.); KorTerra for OneCall (call before you dig) services.

Identify the differences between a public versus a private cloud, and determine whether one is more appropriate for the utility industry.

Essentially, private cloud is an application or service built inside your four walls and public cloud is outside of it. The level of appropriateness depends on the application and the utility. Again, not all cloud providers are the same. At the end of the day, the discussion is more about the negotiated Service Level(s) versus Reliability versus Cost. Service Level breach penalties also need to be carefully considered as they often do not come close to compensating for a loss of service.

ii. Identify public utilities that have adopted cloud-based solutions and what effect cloud services have had on the utility's safety and reliability.

The Water Utilities have not investigated which utilities might have adopted cloud-based solutions. The Water Utilities have tactically adopted cloud services in limited areas and continue to weigh the options and costs as new services are needed.

iii. Identify circumstances where the utility and its customers are better served by a combination of utility-owned, on-premises IT systems and cloud services, a "hybrid" model. What approach best maximizes reliability, safety and security for a utility and its customers?

Please see response to Question B.2 (ii). Different utilities will take different approaches; to date, the Water Utilities have adopted a hybrid model, with cloud-based applications being adopted in limited circumstances.

3. Identify successful cloud services adopted by non-utility, but highly regulated, companies or industries. Explain any lessons from their experience that can help maximize reliability, safety, and security for a utility and its customers.

It appears that companies such as Comcast, Netflix, and Pfizer have had significant success in the cloud. On the other hand, it seems that the launch of healthcare.gov was very problematic. Ultimately, internal or cloud solutions still succeed or fail from project basics (good requirements gathering, project planning, security planning, testing, etc.). Where the servers "sit" is also a major factor in decision-making and planning, but not the reason deployments go well or poorly.

C. <u>Cybersecurity</u>:

1. Cloud Security

i. Describe whether and how utilities will benefit from the cybersecurity practices provided by cloud-based solutions providers versus those associated with on-premises solutions.

In a cloud-based solution the cybersecurity controls are generally the responsibility of the provider.

ii. Identify any cybersecurity benefits of using a cloud-based solution versus an on-premises IT system.

On-premise solutions require the utility to manage all aspects of cybersecurity. Utilities invariably have varying levels of cybersecurity competencies, creating inconsistent levels of security controls. Allowing the cloud provider to manage the security of their product, creates a highly consistent security model.

2. New Risks

i. Describe the extent of new risks introduced (if any) when a utility migrates to a cloud-based solution from an existing on-premises system.

The reduction or increase in risk is highly dependent on the type of cloud solution being implemented and the internal capabilities of the utility. Proper due diligence and incorporating security concepts as a foundational element of the design of the cloud solution being implemented can mitigate identified risks.

3. Incident Response

i. Describe how cloud-based solution providers can respond to cybersecurity threats in contrast to utilities utilizing on-premises systems.

The capability of the cloud providers and utilities varies widely. Generally, in our experience, cloud providers have a responsibility for security for their customers, and therefore have resources to respond to cybersecurity threats. The response capabilities by utilities will also vary widely.

4. Threat Detection

i. Describe whether and how a cloud-based solution can assist a utility in protecting, detecting, and responding to cybersecurity threats and operational vulnerabilities.

Depending on the cloud provider selected, they may be able to provide a unique and advanced skill set to support the utility with vulnerability management.

5. Security Framework for Utilities

i. Identify the key elements and value of a security best-practices framework for utilities to address cybersecurity threats.

Utilizing a security framework such as the NIST cybersecurity framework, is essential and foundational to a robust and comprehensive cybersecurity program. Additionally, a utility should develop cybersecurity controls consistent with industry best practices.

ii. Identify the security best-practices framework you would recommend for Commission adoption and explain why.

NIST Cybersecurity framework. Developed specifically for the critical infrastructure sectors, the framework provides a consistent and practical approach to developing a comprehensive cybersecurity program. Additionally, the water sector through the Water Sector Coordinating Council in partnership with the EPA has adopted the framework, and AWWA has developed an implementation guide for utilities.

6. Security Framework for Cloud Providers

i. Identify the key elements and value of standardized security requirements for cloud-based solution providers.
ii. Identify and explain the security best-practices framework you would recommend the Commission adopt for cloud services. Explain how this framework differs from security best-practices you would recommend for on-premises systems.
iii. Identify the key elements and value of standardized due diligence guidelines for utilities when selecting cloud-based solution providers. Explain how this guidance is different from selecting on-premises solutions.
iv. Identify the cloud services selection guidelines you would recommend for Commission adoption and explain why.

Utilities should take a risk-based approach. However, in response to Questions C.6 (i-iv), there is no single set of guidelines or best practices that we would recommend the Commission adopt at this time, given the variability of cloud arrangement possibilities.

7. Best Practices

i. Describe how best practices in protecting sensitive utility and customer information differ between cloud-based hosting and on-premises hosting.

The concepts employed to protect sensitive utility and customer information would be the same in both cloud and on-premise hosting solutions.

8. Compliance

i. Describe whether and how cloud based solutions can improve utility compliance, privacy, and data security.

In certain circumstances, a cloud solution may provide improved compliance, privacy and data security, but this would depend on a wide variety of factors.

9. What Should Utilities Avoid Putting in the Cloud?

i. Describe the utility functions - including generation, transmission, distribution, metering, consumption, customer data management and customer experience - that should not be placed in the cloud and explain why. Would your answer depend on whether the information was placed in a public versus private cloud?

Utilities should take a risk-based approach. However, there is no single set of guidelines or best practices for what should or shouldn't be placed in the cloud.

10. Connectivity

i. Describe how existing utility IT systems that are not currently interconnected can be made to integrate if hosted in the cloud. What are the benefits and vulnerabilities introduced by interconnecting various utility IT services?

At this time, the Water Utilities do not see a material interconnection opportunity related to cloud based solutions compared to on-premise solutions.

<u>Regulatory Barriers</u>:

A. <u>Ratemaking Treatment</u>:

1. Does current ratemaking practice discourage Illinois utilities from deploying cloud-based solutions (e.g., data analytics) provided by third party vendors?

It may. FASB Accounting Standards Update 2015-05 took effect only very recently, so any ramifications in ratemaking are not fully known yet. However, both ratemaking and accounting treatment do influence technology deployment and the FASB update changes the potential landscape of technology accounting and recovery. So this is an emerging topic of concern.

2. Describe any reasonable justification for accounting ratemaking distinction between investing in cloud-based solutions and investing in on-premises solutions.

Recovery of investments made in the provision of utility service is essential to driving and supporting investment in Illinois' infrastructure. To maintain intergenerational equity and to avoid one-time costs in test years, it would seem most reasonable not to make a ratemaking distinction between these two technology solution types. That said, sometimes unique ratemaking solutions can be targeted to certain investment types, so it could be that special riders or mechanisms would produce positive results in promoting cloud computing. Likewise, recognizing cloud computing investments as intangible assets in NARUC account 339.1 could be a simple practical solution.

3. Describe whether and how utilities are adopting cloud-based solutions despite its accounting treatment.

The accounting clarification is only very recent, so there is little history to examine related to whether and how cloud-based solutions are still being pursued. The Water Utilities will continue exploring cloud-based solutions, but the ratemaking treatment is a concern.

4. Identify alternative ratemaking treatments that would render Illinois utilities indifferent in either choosing to deploy cloud-based solutions provided by third party vendors or continuing with on-premises IT systems owned by the utility.

If ratemaking treatments were handled the same way for cloud-based solution and on-premise solutions, this would remove the influence of ratemaking on cloud vs. on-premise decisions. Other factors which yield benefits for customers, such as efficiency and resource optimization, would still influence IT decisions between the two solution types, but at least ratemaking variances would not influence the decision process.

Recognizing cloud computing investments as intangible assets in NARUC account 339.1 might be a good, simple solution.

Intelligent-systems rider programs have also been used in some US jurisdictions.

i. For each alternative identified, identify the costs and benefits of implementing that alternative.

The costs of deploying the alternatives discussed above would be very low, as these options generally require very little regulatory expense and can even reduce regulatory expense to the extent they prolong the time between rate cases.

ii. For each alternative identified, identify Illinois administrative rules that would need to be revised, and the revisions(s) required, in order to implement that alternative.

Changes to administrative rules might improve regulatory certainty around the capitalization of cloud-based solutions. Without this, the Commission would have the authority to grant capital treatment of cloud-based solutions, but the ratemaking would be on a case-by-case basis. The resulting uncertainty could serve as a barrier to cloud-based deployments. If capitalization of cloud-based systems were permitted by rule, however, then cloud-based solutions could be accounted for the same way as on-premise solutions would, thus removing ratemaking and accounting concerns as a factor in utility decision making.

The use of intelligent-systems riders would likely require a change to Illinois administrative rules. The administrative rules for Qualified Infrastructure Plant are actually under revision presently, following a lengthy process. The rider program has been expanded to cover many kinds of plant investments, but not software or computer systems, which both fall under "General Plant", in NARUC account 340.

B. <u>Other Barriers</u>:

1. Identify and explain any other regulatory barriers that discourage Illinois utilities from deploying cloud-based solutions (e.g., data analytics) that would otherwise be in the best interest of the utility and its customers. For each barrier identified, identify Illinois administrative rules that would need to be revised, and the revision(s) required, to eliminate that barrier.

No other barriers are identified at this time.

Additional Benefits of Cloud Deployment:

1. Describe the types of cloud-based technologies available for electric, gas, and water utilities.

Some of the cloud-based technologies that the Water Utilities have deployed include source water monitoring, meter data management, emergency notification and some talent management tools.

2. In electric utilities:

i. Identify specific software services not currently deployed in Illinois available to engage customers in distributed generation, distributed storage, demand response, and energy efficiency programs. Are those tools available as on-premises and cloud solutions, or is only one option available?

N/A

iii. Identify specific services not currently deployed in Illinois that could provide customer engagement portals that improve customer engagement, increase customer satisfaction, and help meet regulatory mandates for verified energy savings and demand reduction.

N/A

3. In water and gas utilities:

i. Identify the types of software or services not currently deployed in Illinois that could improve customer engagement and increase customer satisfaction.

Cloud software and services are always evolving. We will continue to evaluate solutions to see if they are appropriate.

ii. Identify the types of software or services not currently deployed in Illinois that could detect leaks and inefficiencies, improve conservation, and lower operating costs.

Cloud software and services are always evolving. We will continue to evaluate solutions to see if they are appropriate.

4. Describe any additional feature benefits to a utility when adopting a cloud-based solution. For example, what are the benefits of cloud software that analyzes consumption patterns, identifies malfunctioning meters, reduces unbilled energy, or engages in predictive maintenance and load forecasting, among other things.

Features and benefits need to be weighed between cloud and internal solutions.

Respectfully submitted,

ILLINOIS-AMERICAN WATER COMPANY

By: _____
Bruce A. Hauk, President

AQUA ILLINOIS, INC.

By: _____
Craig L. Blanchette, President