SUPPLEMENTAL MATERIALS

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Adoption of Artificial Intelligence in Drinking Water Operations: A Survey of Progress in the United States

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How Do Large Community Water Systems Use Artificial Intelligence?

Artificial intelligence (AI) is a set of technologies (including machine learning) that can go beyond SCADA to learn a water system's patterns, predict future conditions, and/or recommend particular actions to optimize treatment or distribution operations. This survey is being conducted on large community water systems in the United States to understand their use of AI.

No personal or specific facility information is being collected and your responses will remain anonymous.

- ○ I have read the above statement and agree to take the survey
- ○ I do not agree to take the survey

Skip To: End of Survey If Artificial intelligence (AI) is a set of technologies (including machine learning) that can go be... = I do not agree to take the survey

Display This Question:
If Artificial intelligence (AI) is a set of technologies (including machine learning) that can go be... = I have read the above statement and agree to take the survey

Q3 What is the name of your water system?
(This information is only used to ensure legitimate responses and will not be published or associated with your answers.)

_____

Display This Question:
If If What is the name of your water system?(This information is only used to ensure legitimate responses and will not be published or associated with your answers.) Text Response Is Displayed

Q4 Have you in the past, or do you currently use, **some form of AI** in your water system's operations?

- ○ Yes
- ○ No
- ○ Not sure

Display This Question:
If Have you in the past, or do you currently use, some form of AI in your water system's operations? = No
Or Have you in the past, or do you currently use, some form of AI in your water system's operations? = Not sure

Q5 If no or not sure, do you **plan to** in next 5 years?

- ○ Yes
- ○ Maybe
- ○ No

Display This Question:
If Have you in the past, or do you currently use, some form of AI in your water system's operations? = Yes
Or Have you in the past, or do you currently use, some form of AI in your water system's operations? = Not sure

Q8 At **what stage** is your use of AI?

- ○ We have never experimented with predictions and training models.
- ○ We have experimented with predictions and training models.
- ○ We have manually used AI models for analyses.
- ○ We have partially integrated AI models into our system.
- ○ We have fully integrated AI models into our system.
- ○ Other: _____

Display This Question:
If Have you in the past, or do you currently use, some form of AI in your water system's operations? = Yes

Q9 **How long** have you used AI in your water system?

- ○ Less than 2 years
- ○ 2-5 years
- ○ More than 5 years
- ○ Not sure

Display This Question:
If Have you in the past, or do you currently use, some form of AI in your water system's operations? = Yes

Q10 **What** do you use AI for? Select all that apply.

- ☐ Prediction
- ☐ Optimization
- ☐ Other: _____

Display This Question:
If Have you in the past, or do you currently use, some form of AI in your water system's operations? = Yes
Or If no or not sure, do you plan to in next 5 years? = Yes
Or If no or not sure, do you plan to in next 5 years? = Maybe

Q11 Please **explain** your response to the previous question.

_____

Display This Question:
If Have you in the past, or do you currently use, some form of AI in your water system's operations? = Yes
Or If no or not sure, do you plan to in next 5 years? = Yes
Or If no or not sure, do you plan to in next 5 years? = Maybe

Q12 **What area** of the system do you use or plan to use it for? Select all that apply.

- ☐ Treatment
- ☐ Distribution
- ☐ Other: _____

Display This Question:
If Have you in the past, or do you currently use, some form of AI in your water system's operations? = Yes
Or If no or not sure, do you plan to in next 5 years? = Yes
Or If no or not sure, do you plan to in next 5 years? = Maybe

Q13 Describe your **motivations** for using or planning to use AI. Select **up to 3**.

- ☐ Improve water quality
- ☐ Improve hydraulics
- ☐ Save money
- ☐ Automate complex system
- ☐ Save energy
- ☐ Save time/labor
- ☐ Integrate with other technologies
- ☐ Improve public perception
- ☐ Enhance water conservation
- ☐ Detect leaks
- ☐ Other: _____

Display This Question:
If Have you in the past, or do you currently use, some form of AI in your water system's operations? = Yes
Or If no or not sure, do you plan to in next 5 years? = Yes
Or If no or not sure, do you plan to in next 5 years? = Maybe

Q14 Please explain your response to the previous question.

_____

Display This Question:
If Have you in the past, or do you currently use, some form of AI in your water system's operations? = Yes

Q15 Please select the **benefits** you have seen from using AI in your water system. Select **up to 3**.

- ☐ Improve water quality
- ☐ Improve hydraulics
- ☐ Save money
- ☐ Automate complex system
- ☐ Save energy
- ☐ Save time/labor
- ☐ Integrate with other technologies
- ☐ Improve public perception
- ☐ Enhance water conservation
- ☐ Detect leaks
- ☐ Other: _____

Display This Question:
If If no or not sure, do you plan to in next 5 years? = Yes
Or If no or not sure, do you plan to in next 5 years? = Maybe
Or If no or not sure, do you plan to in next 5 years? = No

Q22 Please select the **benefits** you would like to see from using AI in your water system. Select **up to 3**.

- ☐ Improve water quality
- ☐ Improve hydraulics
- ☐ Save money
- ☐ Automate complex system
- ☐ Save energy
- ☐ Save time/labor
- ☐ Integrate with other technologies
- ☐ Improve public perception
- ☐ Enhance water conservation
- ☐ Detect leaks
- ☐ Other: _____

Q21 Please explain why you picked your **top 3** benefits.

_____

Display This Question:
If Have you in the past, or do you currently use, some form of AI in your water system's operations? = No
Or Have you in the past, or do you currently use, some form of AI in your water system's operations? = Not sure
Or Have you in the past, or do you currently use, some form of AI in your water system's operations? = Yes
Or If no or not sure, do you plan to in next 5 years? = Yes
Or If no or not sure, do you plan to in next 5 years? = Maybe
Or If no or not sure, do you plan to in next 5 years? = No

Q19 What are the barriers that you have seen or are preventing you from currently using AI in your system? Select **up to 3**.

- ☐ Funding - Not having the money to commit to AI projects
- ☐ Payback - Uncertainty about return on investment, or long payback time for investment in AI
- ☐ Data Availability - Not having enough data to make AI meaningful.
- ☐ Data Quality - Not having access to the right kind of data to make AI meaningful.
- ☐ Personnel/Skills - Not having staff or consultants who know how to use or manage AI.
- ☐ Scalability/Repeatability - Not being able to advance from one-time AI experiments to full-scale, ongoing integration.
- ☐ Prefer to use other technology
- ☐ Other: _____

Q20 Please explain why you picked your **top 3** barriers.

_____

Display This Question:
If Have you in the past, or do you currently use, some form of AI in your water system's operations? = Yes
Or Have you in the past, or do you currently use, some form of AI in your water system's operations? = No
Or Have you in the past, or do you currently use, some form of AI in your water system's operations? = Not sure
Or If no or not sure, do you plan to in next 5 years? = Yes
Or If no or not sure, do you plan to in next 5 years? = Maybe
Or If no or not sure, do you plan to in next 5 years? = No
Or Artificial intelligence (AI) is a set of technologies (including machine learning) that can go be... = I have read the above statement and agree to take the survey
Or Artificial intelligence (AI) is a set of technologies (including machine learning) that can go be... = I do not agree to take the survey

Q16 Please offer any **additional comments** (optional).

_____

Table S1. Survey Results

Temporary ID	Have you in the past, or do you currently use, some form of AI in your water system's operations?	If no or not sure, do you plan to in next 5 years?	At what stage is your use of AI? - Selected Choice	At what stage is your use of AI? - Other: - Text	How long have you used AI in your water system?	What do you use AI for? Select all that apply. - Selected Choice	What do you use AI for? Select all that apply. - Other: - Text	Please explain your response to the previous question.	What area of the system do you use or plan to use it for? Select all that apply. - Selected Choice	What area of the system do you use or plan to use it for? Select all that apply. - Other: - Text	Describe your motivations for using or planning to use AI. Select up to 3. - Selected Choice	Describe your motivations for using or planning to use AI. Select up to 3. - Other: - Text	Please explain your response to the previous question.2	Please select the benefits you have seen from using AI in your water system. Select up to 3. - Selected Choice	Please select the benefits you have seen from using AI in your water system. Select up to 3. - Other: - Text	Please select the benefits you would like to see from using AI in your water system. Select up to 3. - Selected Choice	Please select the benefits you would like to see from using AI in your water system. Select up to 3. - Other: - Text	Please explain why you picked your top 3 benefits.	What are the barriers that you have seen or are preventing you from currently using AI in your system? Select up to 3. - Selected Choice	What are the barriers that you have seen or are preventing you from currently using AI in your system? Select up to 3. - Other: - Text	Please explain why you picked your top 3 barriers.	Please offer any additional comments (optional).
1	Yes		We have partially integrated AI models into our system.		More than 5 years	Optimization		used to pump water at optimal times for energy savings	Distribution		Improve water quality,Improve hydraulics,Save energy		With SCADA and AI we can optimize water movement within the District	Automate complex system,Save energy,Save time/labor				reduced the manual efforts and increased efficiency	Other:	Time	takes time to pull the info togethergether	
2	Yes		We have manually used AI models for analyses.		2-5 years	Prediction		predictive main breaks and sewer tv condition accessment	Distribution		Save money,Save time/labor,Enhance water conservation		determine which mains are likely to break most often and replace them. We are short on employees so may use AI to determine condition of pipe through sewer pipe videos	Automate complex system,Integrate with other technologies,Enhance water conservation				using AI has helped us determine projects for water main replacement and also for determining who is watering more than they should.	Payback - Uncertainty about return on investment, or long payback time for investment in AI,Data Availability - Not having enough data to make AI meaningful.,Scalability/Repeatability - Not being able to advance from one-time AI experiments to full-scale, ongoing integration.		We would like to use AI to determine lead service lines but we don't have enough information to make it worth it. We have used AI to do a onetime look at our water mains but it is expensive and hard to do consistantly	
3	Yes		We have partially integrated AI models into our system.		Less than 2 years	Optimization		Pump sequencing energy analysis and recommendations	Distribution		Save money,Automate complex system,Save energy			Save money,Automate complex system,Save energy				Our overall wire to water efficiency (incoming horsepower/water horsepower) is decreasing which helps manage increasing energy rates. Energy is one of our largest expenses	Data Availability - Not having enough data to make AI meaningful.,Data Quality - Not having access to the right kind of data to make AI meaningful.		Accurate field data is important for energy recommendations. This requires the installation of accurate energy and volumetric meters. This is a large foundational task for a medium/large agency	
4	Yes		We have manually used AI models for analyses.	We used sensors for machine learning on pumps (vibration, temp, etc.) for predictive modeling of failure. This was in the late 1990s. It was over the operator's capabilities and was never fully utilized. It is not used currently.	More than 5 years	Prediction,Other:	pump/motor failure	We no longer use it....	Distribution,Other:	lead service lines, possibly	Improve water quality,Improve public perception,Other:	lead service line prediction	use onsite inspections to populate GIS; do cohort data analysis and other trending analyses to try and predict lead service lines without digging for verification	Other:	none....not currently used.			N/A	Funding - Not having the money to commit to AI projects,Payback - Uncertainty about return on investment, or long payback time for investment in AI,Personnel/Skills - Not having staff or consultants who know how to use or manage AI.		Self explanatory. Expensive to provide, staff not skilled to interpret or run analytics, and hence finding payback is not feasible	none.
5	Yes		We have manually used AI models for analyses.		Less than 2 years	Optimization			Distribution,Other:	Sewage Collection System Condition Assessment	Save money,Automate complex system,Save time/labor,Improve public perception,Detect leaks			Save time/labor,Integrate with other technologies					Data Quality - Not having access to the right kind of data to make AI meaningful.,Personnel/Skills - Not having staff or consultants who know how to use or manage AI.,Scalability/Repeatability - Not being able to advance from one-time AI experiments to full-scale, ongoing integration.,Prefer to use other technology		Water and sewer operation personnel have a conservative mindset when adopting new technology they are not familiar with (esp. Water/WW treatment plant staff)	
6	Yes		We have experimented with predictions and training models.					We use lake level prediction models for our reservoir	Other:	reservoir	Enhance water conservation		If we need to enhance conservation measures because of lake level forecasting results, we can do so ahead of additional drops in reservoir levels			Improve water quality,Integrate with other technologies,Enhance water conservation		The provision of clean safe drinking water is our mission	Payback - Uncertainty about return on investment, or long payback time for investment in AI,Data Availability - Not having enough data to make AI meaningful.,Scalability/Repeatability - Not being able to advance from one-time AI experiments to full-scale, ongoing integration.		Those are need to have things	

Temporary ID	Have you in the past, or do you currently use, some form of AI in your water system's operations?	If no or not sure, do you plan to in next 5 years?	At what stage is your use of AI? - Selected Choice	At what stage is your use of AI? - Other: - Text	How long have you used AI in your water system?	What do you use AI for? Select all that apply. - Selected Choice	What do you use AI for? Select all that apply. - Other: - Text	Please explain your response to the previous question.	What area of the system do you use or plan to use it for? Select all that apply. - Selected Choice	What area of the system do you use or plan to use it for? Select all that apply. - Other: - Text	Describe your motivations for using or planning to use AI. Select up to 3. - Selected Choice	Describe your motivations for using or planning to use AI. Select up to 3. - Other: - Text	Please explain your response to the previous question.2	Please select the benefits you have seen from using AI in your water system. Select up to 3. - Selected Choice	Please select the benefits you have seen from using AI in your water system. Select up to 3. - Other: - Text	Please select the benefits you would like to see from using AI in your water system. Select up to 3. - Selected Choice	Please select the benefits you would like to see from using AI in your water system. Select up to 3. - Other: - Text	Please explain why you picked your top 3 benefits.	What are the barriers that you have seen or are preventing you from currently using AI in your system? Select up to 3. - Selected Choice	What are the barriers that you have seen or are preventing you from currently using AI in your system? Select up to 3. - Other: - Text	Please explain why you picked your top 3 barriers.	Please offer any additional comments (optional).
7	Yes		We have experimented with predictions and training models.						Treatment		Improve water quality,Automate complex system,Detect leaks					Save money,Integrate with other technologies,Enhance water conservation			Funding - Not having the money to commit to AI projects,Payback - Uncertainty about return on investment, or long payback time for investment in AI,Data Quality - Not having access to the right kind of data to make AI meaningful.			
8	Yes		We have partially integrated AI models into our system.		2-5 years	Optimization			Treatment		Improve water quality,Save money			Improve water quality,Save money								
9	Yes		We have experimented with predictions and training models.		Less than 2 years	Prediction		If this then what?	Treatment,Distribution		Integrate with other technologies,Other:	We are a data driven organization. We go where the data and trends lead us. We always try to predict the outcome and judge and record our successes and failures		Integrate with other technologies				We just never know exactly what the outcome may be. Weâ€™re as wrong as we are correct	Personnel/Skills - Not having staff or consultants who know how to use or manage AI.,Scalability/Repeatability - Not being able to advance from one-time AI experiments to full-scale, ongoing integration.,Other:	Hard to find qualified staff		I really thinks itâ€™s the future and we actually use AII in it most basic, crudest form, plenty rain, ph goes up harder to coagulate etc
10	Yes		We have manually used AI models for analyses.		More than 5 years	Prediction,Optimization			Treatment,Distribution		Improve water quality,Improve hydraulics,Automate complex system			Improve water quality,Improve hydraulics,Automate complex system					Funding - Not having the money to commit to AI projects,Personnel/Skills - Not having staff or consultants who know how to use or manage AI.			
11	Yes																					
12	Not sure	No														Improve hydraulics,Save energy,Detect leaks		Realistic Expectations	Other:	AI is not reliable at this time. Uses are still limited to leak detection and alarms.	most benefit	
13	Not sure																					
14	No	Yes						We anticipate using machine learning in the future to predict normal usage patterns	Distribution		Improve hydraulics,Save money,Automate complex system,Save energy,Save time/labor,Integrate with other technologies,Enhance water conservation,Detect leaks					Automate complex system,Save energy,Detect leaks		Water conservation is our top priority	Personnel/Skills - Not having staff or consultants who know how to use or manage AI.			
15	No	Yes						Having discussions about using AI to predict main breaks so water mains can be replaced proactively.	Distribution		Save money,Improve public perception,Detect leaks		Leaks will become breaks which are costly to repair and harm our public image.			Save money,Improve public perception,Detect leaks		Leaks will become breaks which are costly to repair and harm our public image.	Data Availability - Not having enough data to make AI meaningful.,Personnel/Skills - Not having staff or consultants who know how to use or manage AI.		Data in GIS is still being refined and staff are too busy fighting other fires.	
16	No	Yes						We are piloting pipe failure prediction in our distribution system	Treatment,Distribution		Improve water quality,Improve hydraulics,Save money,Automate complex system,Save energy,Save time/labor,Integrate with other technologies,Improve public perception,Enhance water conservation,Detect leaks					Save energy,Enhance water conservation,Detect leaks		These are key focus of our utility.	Data Quality - Not having access to the right kind of data to make AI meaningful.,Personnel/Skills - Not having staff or consultants who know how to use or manage AI.,Scalability/Repeatability - Not being able to advance from one-time AI experiments to full-scale, ongoing integration.			

Temporary ID	Have you in the past, or do you currently use, some form of AI in your water system's operations?	If no or not sure, do you plan to in next 5 years?	At what stage is your use of AI? - Selected Choice	At what stage is your use of AI? - Other: - Text	How long have you used AI in your water system?	What do you use AI for? Select all that apply. - Selected Choice	What do you use AI for? Select all that apply. - Other: - Text	Please explain your response to the previous question.	What area of the system do you use or plan to use it for? Select all that apply. - Selected Choice	What area of the system do you use or plan to use it for? Select all that apply. - Other: - Text	Describe your motivations for using or planning to use AI. Select up to 3. - Selected Choice	Describe your motivations for using or planning to use AI. Select up to 3. - Other: - Text	Please explain your response to the previous question.2	Please select the benefits you have seen from using AI in your water system. Select up to 3. - Selected Choice	Please select the benefits you have seen from using AI in your water system. Select up to 3. - Other: - Text	Please select the benefits you would like to see from using AI in your water system. Select up to 3. - Selected Choice	Please select the benefits you would like to see from using AI in your water system. Select up to 3. - Other: - Text	Please explain why you picked your top 3 benefits.	What are the barriers that you have seen or are preventing you from currently using AI in your system? Select up to 3. - Selected Choice	What are the barriers that you have seen or are preventing you from currently using AI in your system? Select up to 3. - Other: - Text	Please explain why you picked your top 3 barriers.	Please offer any additional comments (optional).
17	No	No															Save money,Automate complex system,Detect leaks		efficiency	Payback - Uncertainty about return on investment, or long payback time for investment in AI,Data Availability - Not having enough data to make AI meaningful.,Other:	no knowledge of possibilities	not much known	
18	No	No															Other:	It is important to have trained staff that understand the operation of the water system and not rely on AI to perform these functions.	As noted, moving away from trained staff to perform the operation of the water system will endanger safety.	Prefer to use other technology		In addition to making the system less safe, the use of AI will cost more because the expense of software and programmers is more than the expense of trained water professionals.	A water system should never be "set on automatic" and should always be monitored and operated by experienced staff.
19	No	No															Integrate with other technologies		I picked only one because I do not believe it can be used stand alone	Personnel/Skills - Not having staff or consultants who know how to use or manage AI.		Not convinced it can be relaible for making critical decisions	
20	No	No															Improve water quality,Save money,Automate complex system,Save energy,Save time/labor,Detect leaks		Running a large water plant can be difficult during peak water quality events. AI could potentially help with making decisions based on previous experience.	Payback - Uncertainty about return on investment, or long payback time for investment in AI,Scalability/Repeatability - Not being able to advance from one-time AI experiments to full-scale, ongoing integration.,Prefer to use other technology		I don't know enough about how it can interface with our systems to be beneficial or not.	
21	No	No															Save money,Save energy,Save time/labor		Saving time, money and energy are basic goals that would be applicable to any project.	Payback - Uncertainty about return on investment, or long payback time for investment in AI,Personnel/Skills - Not having staff or consultants who know how to use or manage AI.		Return on investment is a basic criteria to work towards buy-in from our organization.	
22	No	No															Automate complex system,Integrate with other technologies,Detect leaks			Funding - Not having the money to commit to AI projects,Payback - Uncertainty about return on investment, or long payback time for investment in AI,Data Availability - Not having enough data to make AI meaningful.			
23	No	No															Other:	N/A	We don't plan on using AI	Funding - Not having the money to commit to AI projects		Other	
24	No	Maybe						It depends on what and how it is used. Currently, all programs needed human interface to set it up. That is very time consuming.	Distribution		Save time/labor,Enhance water conservation						Save money		Saving is the bottom line. Otherwise, why do it.	Data Availability - Not having enough data to make AI meaningful.,Data Quality - Not having access to the right kind of data to make AI meaningful.,Other:	So far, all the AI claimed is questionable for the water industry.		

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25	No	Maybe							Distribution		Detect leaks,Other:	Main break predictions					Detect leaks,Other:	Main break predictions	Seen industry success with AI in these areas.	Funding - Not having the money to commit to AI projects,Payback - Uncertainty about return on investment, or long payback time for investment in AI,Personnel/Skills - Not having staff or consultants who know how to use or manage AI.		Funding always an issue. Currently do not have staff that have experience with AI	
26	No	Maybe						I am considering AI solutions that will help prioritize water main replacements.	Distribution		Improve hydraulics,Save money						Automate complex system,Save time/labor,Integrate with other technologies		My interest in AI is that it could help us recognize relationships between different departments, organize the data we collect and provide actionable results.	Funding - Not having the money to commit to AI projects,Payback - Uncertainty about return on investment, or long payback time for investment in AI,Personnel/Skills - Not having staff or consultants who know how to use or manage AI.		AI is a popular topic, but I haven't seen many practical benefits compared to our current methods.	
27	No	Maybe							Distribution		Improve water quality,Save money,Detect leaks						Improve water quality,Save money,Save time/labor			Funding - Not having the money to commit to AI projects,Payback - Uncertainty about return on investment, or long payback time for investment in AI,Personnel/Skills - Not having staff or consultants who know how to use or manage AI.			
28	No	Maybe							Distribution		Save money,Enhance water conservation,Detect leaks						Save money,Enhance water conservation,Detect leaks			Funding - Not having the money to commit to AI projects,Payback - Uncertainty about return on investment, or long payback time for investment in AI			
29	No	Maybe						AI could be implemented in the future to improve efficiency.	Distribution		Improve water quality,Save money,Save energy						Improve water quality,Save money,Save energy			Data Availability - Not having enough data to make AI meaningful.,Data Quality - Not having access to the right kind of data to make AI meaningful.,Personnel/Skills - Not having staff or consultants who know how to use or manage AI.			
30	No	Maybe							Other:	Not sure what type of technology we will employ in 5 years	Improve water quality,Save money,Automate complex system,Save time/labor		This is always what we strive to do				Improve water quality,Save money,Automate complex system		We are always looking for opportunities to improve water quality and our efficiency	Funding - Not having the money to commit to AI projects,Personnel/Skills - Not having staff or consultants who know how to use or manage AI,Other:		Funding is always our biggest issue. After that is the labor is our biggest problem. Hiring qualified personnel has historically been difficult but is currently even more so	

Temporary ID	Have you in the past, or do you currently use, some form of AI in your water system's operations?	If no or not sure, do you plan to in next 5 years?	At what stage is your use of AI? - Selected Choice	At what stage is your use of AI? - Other: - Text	How long have you used AI in your water system?	What do you use AI for? Select all that apply. - Selected Choice	What do you use AI for? Select all that apply. - Other: - Text	Please explain your response to the previous question.	What area of the system do you use or plan to use it for? Select all that apply. - Selected Choice	What area of the system do you use or plan to use it for? Select all that apply. - Other: - Text	Describe your motivations for using or planning to use AI. Select up to 3. - Selected Choice	Describe your motivations for using or planning to use AI. Select up to 3. - Other: - Text	Please explain your response to the previous question.2	Please select the benefits you have seen from using AI in your water system. Select up to 3. - Selected Choice	Please select the benefits you have seen from using AI in your water system. Select up to 3. - Other: - Text	Please select the benefits you would like to see from using AI in your water system. Select up to 3. - Selected Choice	Please select the benefits you would like to see from using AI in your water system. Select up to 3. - Other: - Text	Please explain why you picked your top 3 benefits.	What are the barriers that you have seen or are preventing you from currently using AI in your system? Select up to 3. - Selected Choice	What are the barriers that you have seen or are preventing you from currently using AI in your system? Select up to 3. - Other: - Text	Please explain why you picked your top 3 barriers.	Please offer any additional comments (optional).
31	No	Maybe						We are trying to gather more information about how the Commission's sewer and storm drainage system responds to storm events and how different storm events impact the systems. As more information is gathered it may influence future decisions.	Other:	Sewer and Storm Drainage Collection	Integrate with other technologies,Improve public perception,Other:	Increase staff understanding of how systems respond.	By having a more complete understanding of how the system responds storm storm events, it may change the way we maintain the systems and it may help us decide on modifications that may be needed.			Improve water quality,Improve public perception,Other:	Increase security of the system.	It would be interesting to see if AI could detect anamolies.	Payback - Uncertainty about return on investment, or long payback time for investment in AI,Data Availability - Not having enough data to make AI meaningful.,Personnel/Skills - Not having staff or consultants who know how to use or manage AI.		The Commission uses rate payer money to fund projects. We would need to make a case of why this money would need to be spent.	
32	No	Maybe						Iâ€™m not aware of what AI opportunities are available	Treatment		Save energy,Enhance water conservation,Detect leaks					Save energy,Enhance water conservation,Detect leaks			Personnel/Skills - Not having staff or consultants who know how to use or manage AI.,Other:	We are not aware of any process that isnâ€™t already automated in our SCADA System that could help us.		
33	No	Maybe						We have no immediate plans to use AI.	Treatment		Save money,Automate complex system,Save time/labor		I think there are opportunities to use more AI on the treatment side.			Improve water quality,Automate complex system,Save time/labor		Motivations and benefits are similar.	Funding - Not having the money to commit to AI projects,Payback - Uncertainty about return on investment, or long payback time for investment in AI,Data Availability - Not having enough data to make AI meaningful.			
34	No	Maybe							Treatment		Improve water quality,Save money,Automate complex system					Improve water quality,Save money,Automate complex system			Data Availability - Not having enough data to make AI meaningful.,Personnel/Skills - Not having staff or consultants who know how to use or manage AI.			
35	No	Maybe						have not tried	Treatment,Distribution		Improve water quality,Improve hydraulics,Save energy,Detect leaks					Improve water quality,Improve hydraulics,Save energy		become more efficient for our customers	Funding - Not having the money to commit to AI projects,Payback - Uncertainty about return on investment, or long payback time for investment in AI,Other:	postponed due to pandemic		
36	No	Maybe						Technology is always advancing, we may look into AI in the future	Treatment,Distribution		Improve water quality,Automate complex system,Integrate with other technologies		SCADA saves time and is a big help with automation, but AI may be a greater value in the future as systems become more complex and to ensure a safe water supply. Technology is always changing, AI systems may help keep up with advancements. A true AI system would have to prove it is safe and reliable before we would use it.			Improve water quality,Automate complex system,Save time/labor		Water Quality regulations are becoming more stringent and will continue to do so as populations grow. Finding the right trained staff and keeping them is becoming more difficult in this industry. Processes are becoming more complicated and require a higher level of staff and attention. In the future an AI system may be able to help in all three areas which in turn keeps us able to continue to supply high quality and safe drinking water.	Funding - Not having the money to commit to AI projects,Payback - Uncertainty about return on investment, or long payback time for investment in AI,Prefer to use other technology		Just more recently hearing more about AI. There is concerns, unfamiliarity and uncomfortableness with AI, possibly due to stereotyping due to movies, stories extra. Once AI has proven itself more in a wider range of industries and can prove to be safe, people will become more comfortable with the thought of it helping in a drinking water field. Drinking Water is critical and we don't want to take chances. Even with a simple SCADA system staff can become complacent and not as well trained as their predecessors were. True AI may keep people from learning and being able to perform their jobs in an emergency if the AI system went down.	A true AI system may be beneficial, but concerns exist over whether people will continue to learn in the water field if an AI system does it all for them.

Temporary ID	Have you in the past, or do you currently use, some form of AI in your water system's operations?	If no or not sure, do you plan to in next 5 years?	At what stage is your use of AI? - Selected Choice	At what stage is your use of AI? - Other: - Text	How long have you used AI in your water system?	What do you use AI for? Select all that apply. - Selected Choice	What do you use AI for? Select all that apply. - Other: - Text	Please explain your response to the previous question.	What area of the system do you use or plan to use it for? Select all that apply. - Selected Choice	What area of the system do you use or plan to use it for? Select all that apply. - Other: - Text	Describe your motivations for using or planning to use AI. Select up to 3. - Selected Choice	Describe your motivations for using or planning to use AI. Select up to 3. - Other: - Text	Please explain your response to the previous question.2	Please select the benefits you have seen from using AI in your water system. Select up to 3. - Selected Choice	Please select the benefits you have seen from using AI in your water system. Select up to 3. - Other: - Text	Please select the benefits you would like to see from using AI in your water system. Select up to 3. - Selected Choice	Please select the benefits you would like to see from using AI in your water system. Select up to 3. - Other: - Text	Please explain why you picked your top 3 benefits.	What are the barriers that you have seen or are preventing you from currently using AI in your system? Select up to 3. - Selected Choice	What are the barriers that you have seen or are preventing you from currently using AI in your system? Select up to 3. - Other: - Text	Please explain why you picked your top 3 barriers.	Please offer any additional comments (optional).
37	No	Maybe						I don't know if we plan to use AI	Treatment,Distribution		Automate complex system,Save energy,Detect leaks					Automate complex system,Save time/labor,Detect leaks			Data Quality - Not having access to the right kind of data to make AI meaningful.,Personnel/Skills - Not having staff or consultants who know how to use or manage AI.			
38	No	Maybe						We are undergoing a SCADA master plan transitioning to new hardware/software, we need to get the new system up and operational then we may review options for AI.	Treatment,Distribution		Improve water quality,Improve hydraulics,Save money,Integrate with other technologies		n/a			Improve water quality,Improve hydraulics,Integrate with other technologies			Data Availability - Not having enough data to make AI meaningful.,Data Quality - Not having access to the right kind of data to make AI meaningful.,Personnel/Skills - Not having staff or consultants who know how to use or manage AI.			
39	No	Maybe						not sure how the AI will enhance our system, Cyber Security concerns	Treatment,Distribution,Other:	Water Reclamations	Improve water quality,Automate complex system,Detect leaks		Enhance the operation of the system and/or make better operational decisions			Improve water quality,Automate complex system,Detect leaks		Enhance the operation of the system and/or make better operational decisions	Funding - Not having the money to commit to AI projects,Personnel/Skills - Not having staff or consultants who know how to use or manage AI.,Scalability/Repeatability - Not being able to advance from one-time AI experiments to full-scale, ongoing integration.		Budget, staff availability	
40	No	Maybe						There is growing interest in adding AI for chemical cost savings, but nothing firmly planned			Improve water quality,Save money,Save energy					Improve water quality,Save money,Save energy			Data Quality - Not having access to the right kind of data to make AI meaningful.,Other:	Buy in from key stakeholders		
41	No	Maybe									Save energy,Detect leaks					Save energy,Detect leaks			Personnel/Skills - Not having staff or consultants who know how to use or manage AI.			
42	No	Maybe						Not sure AI is useful or tells me something I don't already know			Save money,Save energy,Detect leaks					Save energy			Payback - Uncertainty about return on investment, or long payback time for investment in AI,Data Quality - Not having access to the right kind of data to make AI meaningful.			
43	No	Maybe																				
44	Not sure																					
45	No	No																				
46	No	No																				
47	No	Yes																				
48	No	Yes						We plan to investigate how best to implement AI technologies.	Treatment,Distribution		Save energy,Integrate with other technologies,Detect leaks		All of these areas will improve efficiencies in our system and provide benefit.			Save energy,Enhance water conservation,Detect leaks		All of these areas will improve efficiencies in our system and provide benefit.	Data Availability - Not having enough data to make AI meaningful.,Data Quality - Not having access to the right kind of data to make AI meaningful.			
49	No	Maybe							Treatment,Distribution		Save energy,Save time/labor,Enhance water conservation,Detect leaks					Improve water quality,Save energy,Enhance water conservation			Data Availability - Not having enough data to make AI meaningful.,Personnel/Skills - Not having staff or consultants who know how to use or manage AI.			