

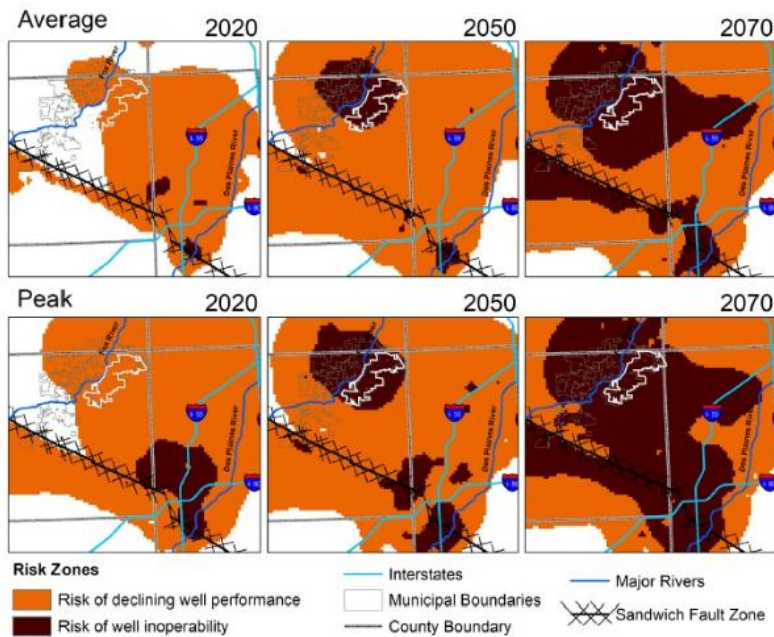
# Alternative Water Source Evaluation - Part II

Village of Oswego, Illinois

Baxter & Woodman, Inc. June 24, 2021



Alternative Water Supply Study



## The Issue

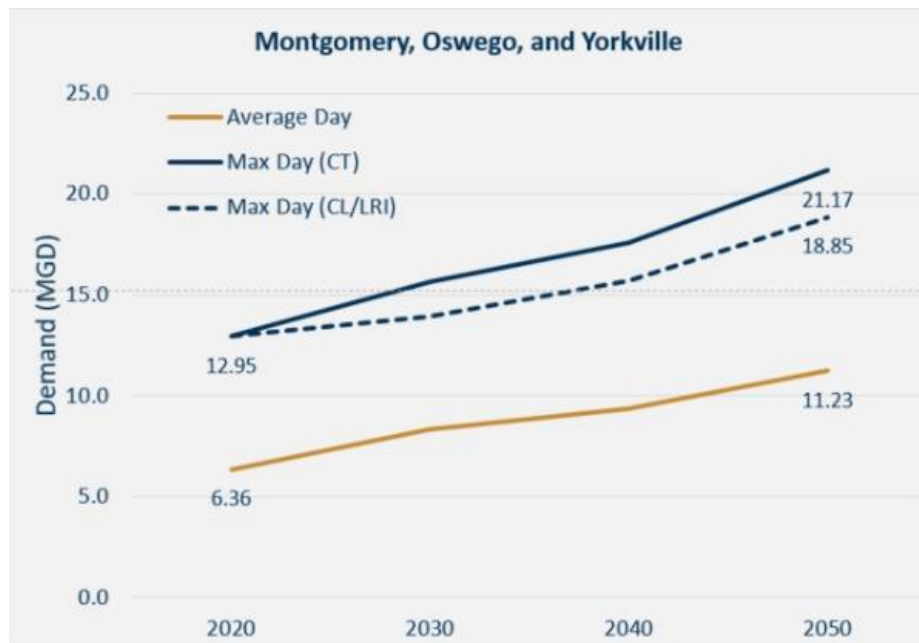
The Village of Oswego uses the deep sandstone aquifer as its water source. The Illinois State Water Survey (ISWS) has projected that the deep aquifer is not sustainable for the future of this region.

“

***Oswego’s sandstone withdrawals are not sustainable. Future water level declines pose a risk to Oswego’s sandstone water supply, and the community will eventually require a new water supply source. – Illinois State Water Survey***

Now is the time to evaluate and select a long-term water source alternative to provide reliable, safe drinking water for the future of the region including Montgomery, Oswego, and Yorkville.





## Planning for the Solution

The Illinois State Water Survey has projected that the region will be at severe risk of well depletion and unable to meet continued population growth and water demands by 2050, even with Joliet leaving the aquifer. Historical water use records were analyzed and combined with population forecasts from Chicago Metropolitan Agency for Planning (CMAP) to project future water demands through 2050 and beyond.

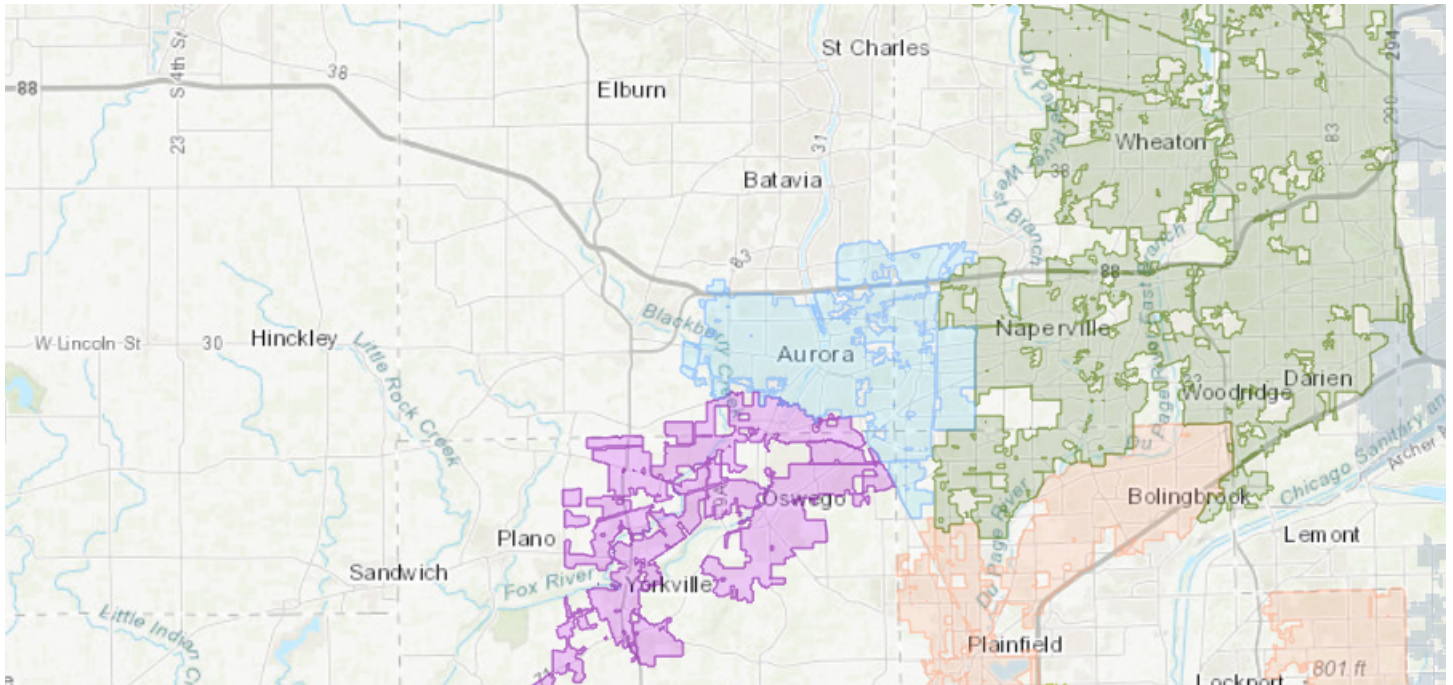
***The future water source must be able to meet the projected demands.***



*Credit: mrjn Photography*

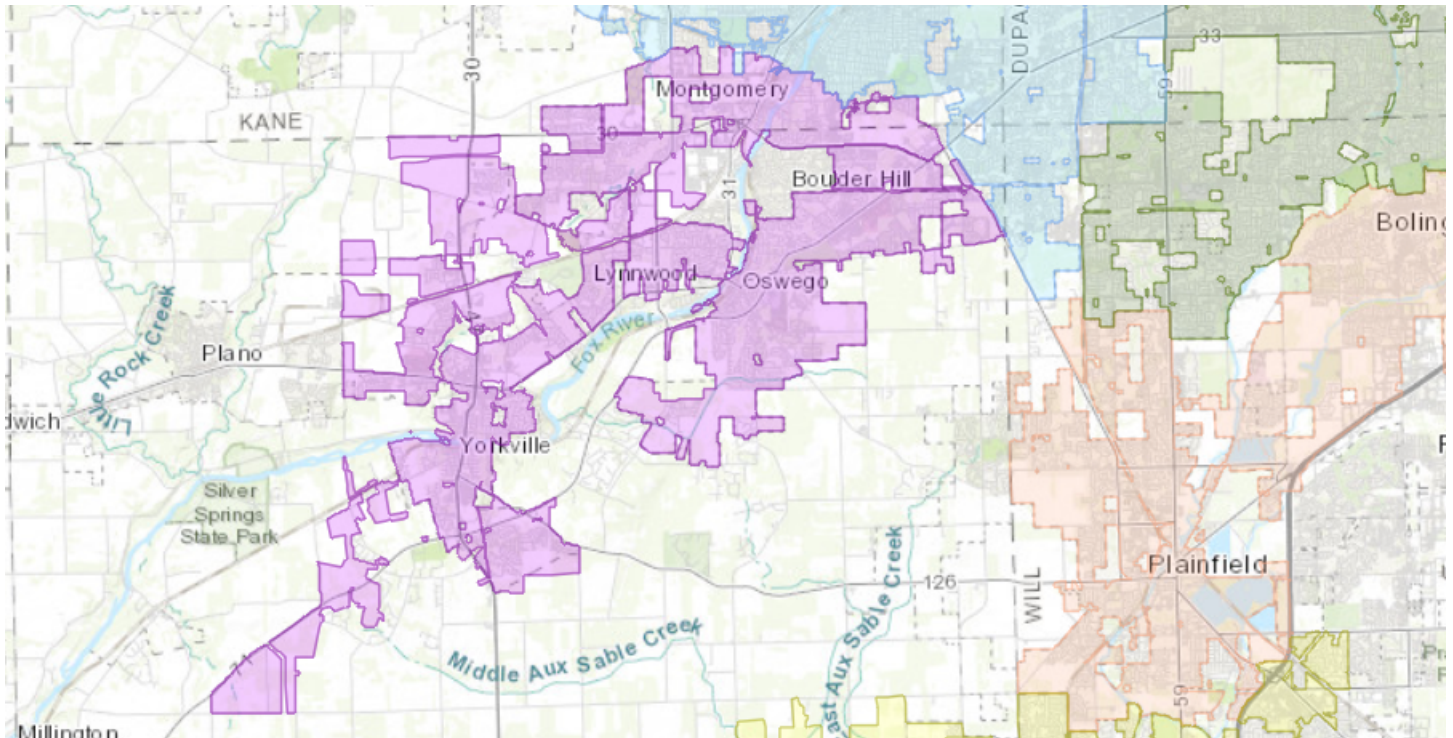






Esri Canada, Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS | Will County Clerk Tax Extension | Kane County... Powered by Esri

## Water Source Alternatives



Village of Oswego, Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS | Will County Clerk Tax Extension | Kane ... Powered by Esri

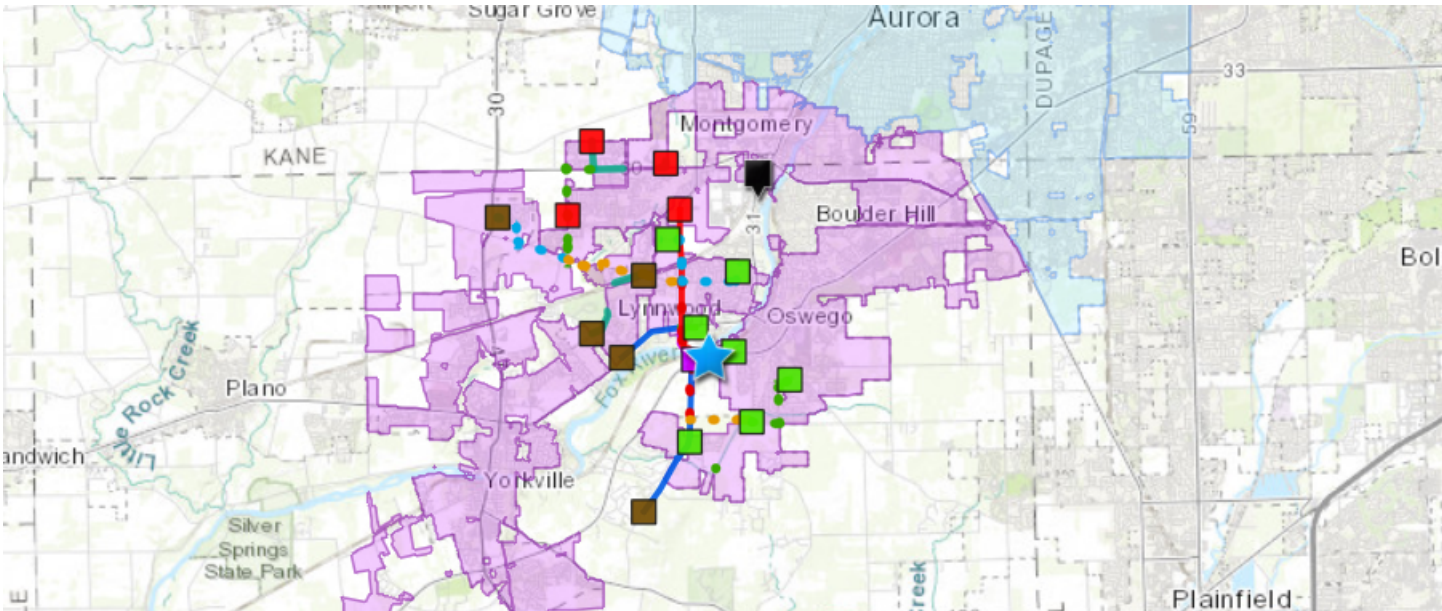
(select option below to view)

Fox River Option

DuPage Water Commission Option

Joliet Water Commission Option

Illinois American Water Option



City of Aurora, IL, Village of Oswego, Esri Canada, Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS | Kane Co... Powered by Esri

## Fox River





Credit: Gary Meulemans

		Fox River Option
💧	<i>Included</i>	
—	<i>Not Included</i>	
○	<i>Optional</i>	
<b>Water Supplier</b>	New raw water intake	💧
	New water treatment plant	💧
	New raw water transmission main	💧
	New treated water transmission main	💧
	New/existing system upgrades	—
	Backup well network	💧
<b>Montgomery, Oswego, Yorkville</b>	New regional well	💧
	New receiving stations	💧
<b>Oswego</b>	Existing system improvements	💧
	New storage/pumping stations	💧
	New intermediate well	💧
	Maintain all existing wells	—

### Key Considerations



- The Fox River is a sustainable source capable of meeting demands during normal flow conditions
- Low Flow/Seasonal Quality Flow Restrictions will limit withdrawal
- Variable water production rates can meet local demands
- Network of wells is required as supplemental/backup supply
- Redundancy would be provided at the new Fox River water treatment plant and with redundant raw water and treated water transmission mains with multiple connection points
- The three communities would need to establish emergency repair protocols to minimize service interruptions



## Water Quality & Permitting

- Raw water hardness: 260-400 mg/L; target treated water hardness: 100-130 mg/L
- Naturally occurring radium present in deep aquifer
- Lime softening and ultrafiltration to treat surface water and partially blended groundwater (Class A Operator License)
- Proposed intake location is approximately three miles downstream of the Fox Metro Water Reclamation Facility
- Seasonal changes in source water may alter the taste and odor of treated water
- IDNR requires a Public Water Supply permit
- Stringent and evolving water quality sampling/permitting requirements set by the IEPA. IEPA also requires construction and operating permits for new facilities



## Governance & Operational Responsibility

- A form of intergovernmental agreement will be needed between Montgomery, Oswego, and Yorkville (e.g. water district, joint action water agency, or water commission)

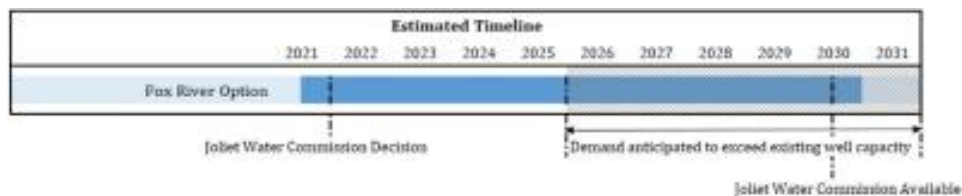


- Shared ownership and control of the water source, treatment, and distribution



## Timeline

- Anticipated timeline ranges between 9-11 years after a decision is made
- Oswego will likely need a new well prior to the completion of the treatment plant in order to meet projected demands



## Internal System Improvements










- Approximately 11,000 feet of water main improvements within the Village of Oswego
- Additional storage recommended to meet 2050 demands



# Lake Michigan - DuPage Water Commission



Credit: Dave Hoefler

	 <i>Included</i>	<b>DuPage Water Commission Option</b>
	 <i>Not Included</i>	
	 <i>Optional</i>	
<b>Water Supplier</b>	New raw water intake	
	New water treatment plant	
	New raw water transmission main	
	New treated water transmission main	
	New/existing system upgrades	
	Backup well network	
<b>Montgomery, Oswego, Yorkville</b>	New regional well	
	New receiving stations	
<b>Oswego</b>	Existing system improvements	
	New storage/pumping stations	
	New intermediate well	
	Maintain all existing wells	

## Key Considerations:



### Sustainability of Water Source

- Lake Michigan is a sustainable source with capacity to meet demands in 2050 and beyond
- DWC agreement limits MDD:ADD ratio to 1.7
- DWC agreement requires its customers to receive water at a constant supply rate
- Existing wells could be kept as emergency backup
- DWC's existing system consists of redundant, looped transmission mains. A singular transmission main would connect Montgomery, Oswego, and Yorkville to the existing DWC system
- DWC has established emergency repair protocols to minimize service interruptions



### Water Quality & Permitting

- Raw and treated water hardness: approximately 140 mg/L
- Detectable levels of radium not present in Lake Michigan
- Additionally chlorine disinfection likely needed for Lake Michigan water treated by the City of Chicago (Class C Operator License)
- Raw water intake cribs are located approximately two miles off Lake Michigan shore
- Lake Michigan water is seasonally consistent
- IDNR requires Lake Michigan Water Allocation (including non-revenue water and conservation requirements)
- IEPA requires construction and operating permits for new facilities




### Governance & Operational Responsibility

- DWC Membership Application requires DWC Board approval and state legal approval to include Kendall and Will Counties
- DWC currently has 29 members
- No direct ownership or control of the source water treatment. Indirect control of the operation and maintenance of the distribution infrastructure
- DWC would own and operate the transmission mains up to the receiving stations

 **Timeline**

- Anticipated timeline ranges between 4-5 years after a decision is made
- It is unlikely that Oswego will require a new well prior to DWC supply

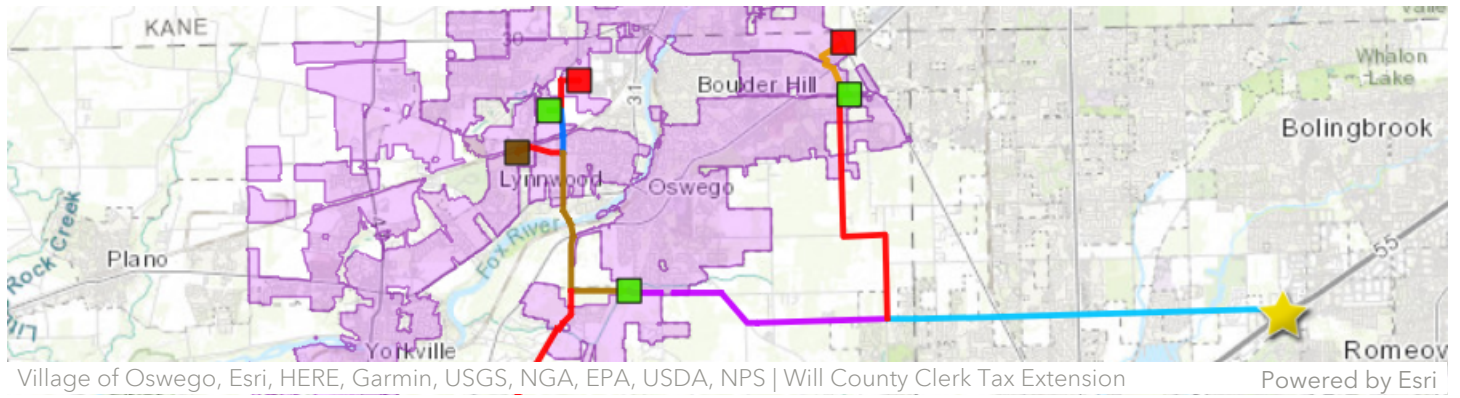


 **Internal System Improvements**

- Approximately 7,900 feet of water main improvements within the Village of Oswego
- Additional storage and pumping improvements needed to meet 2050 demands






















## Lake Michigan - Joliet Water Commission



*Credit: Cole Parsons*

	 <i>Included</i>	
	 <i>Not Included</i>	
	 <i>Optional</i>	
		<b>Joliet Water Commission Option</b>
<b>Water Supplier</b>	New raw water intake	
	New water treatment plant	
	New raw water transmission main	
	New treated water transmission main	
	New/existing system upgrades	
	Backup well network	
<b>Montgomery, Oswego, Yorkville</b>	New regional well	
	New receiving stations	
<b>Oswego</b>	Existing system improvements	
	New storage/pumping stations	
	New intermediate well	
	Maintain all existing wells	

## Key Considerations:

### Sustainability of Water Source

- Lake Michigan is a sustainable source will capacity to meet demands in 2050 and beyond
- Proposed contractual supply agreement limits MDD:ADD ratio to 1.7
- Proposed contractual supply agreement to receive water at a constant supply rate
- Wells could be kept as emergency backup
- Proposed unlooped commission system with singular transmission mains
- Commission will need to establish emergency repair protocols to minimize service interruptions



## Water Quality & Permitting

- Raw and treated water hardness: approximately 140 mg/L
- Detectable levels of radium not present in Lake Michigan
- Additionally chlorine disinfection likely needed for Lake Michigan water treated by the City of Chicago (Class C Operator License)
- Raw water intake cribs are located approximately two miles off Lake Michigan shore
- Lake Michigan water is seasonally consistent
- IDNR requires Lake Michigan Water Allocation (including non-revenue water and conservation requirements)
- IEPA requires construction and operating permits for new facilities



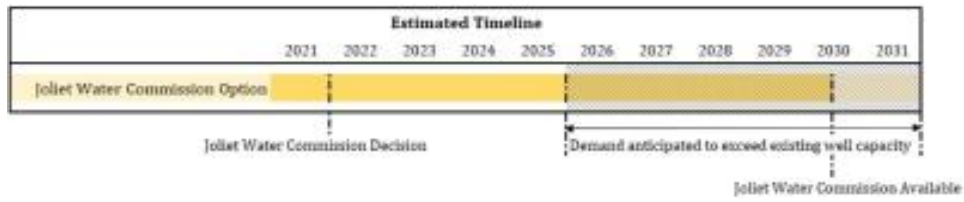
## Governance & Operational Responsibility

- Joliet Water Commission to be formed over the course of 2021
- 12 communities are in discussion
- No direct ownership or control of the source water treatment. Indirect control of the operation and maintenance of the distribution infrastructure
- Joliet Water Commission proposes to own and operate transmission mains up to receiving stations



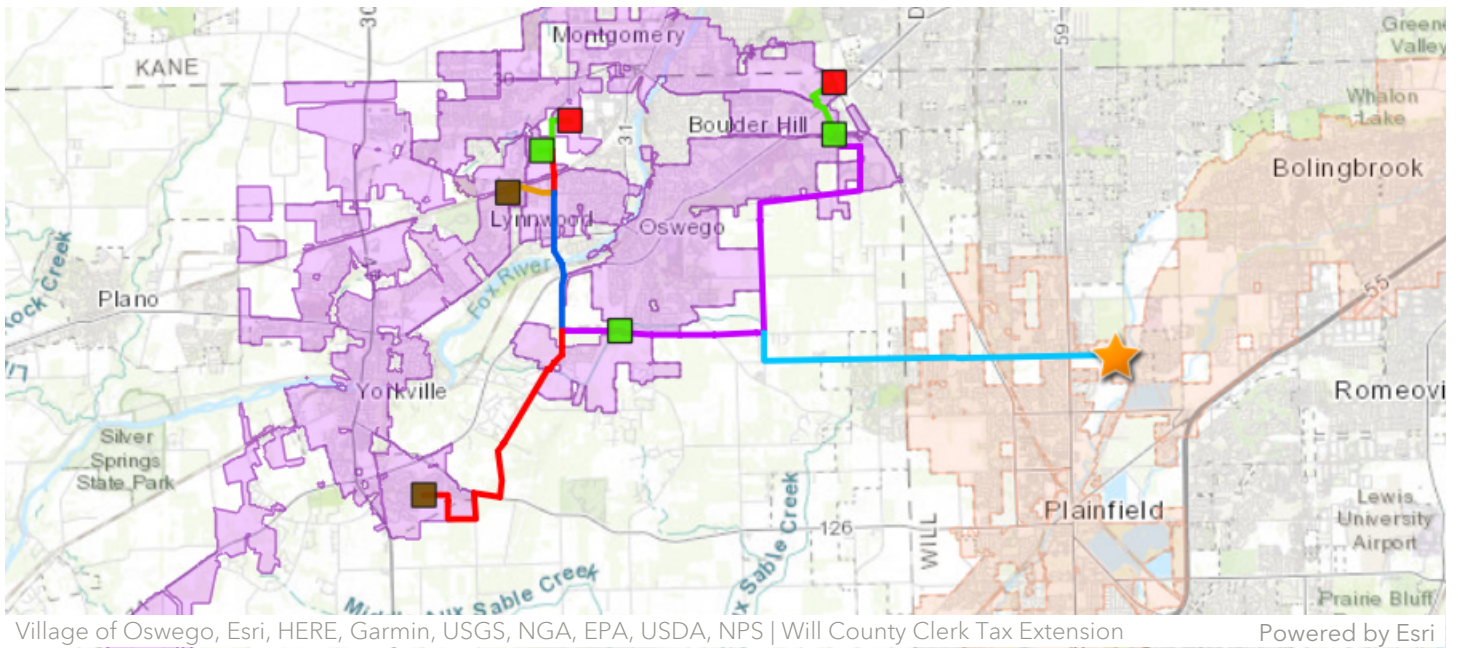
## Timeline

- Joliet Water Commission targets Lake Michigan supply in 2030
- Oswego will likely need a new well prior to the completion of the Joliet Water Commission system in order to meet projected demands



## Internal System Improvements

- Approximately 7,900 feet of water main improvements for the Village of Oswego
- Additional storage and pumping improvements needed to meet 2050 demands









## Lake Michigan - Illinois American Water





Credit: Jonnelle Yankovich

	Included	<b>Illinois American Water Option</b>
—	Not Included	
○	Optional	
<b>Water Supplier</b>	New raw water intake	—
	New water treatment plant	—
	New raw water transmission main	—
	New treated water transmission main	
	New/existing system upgrades	
	Backup well network	—
<b>Montgomery, Oswego, Yorkville</b>	New regional well	—
	New receiving stations	
<b>Oswego</b>	Existing system improvements	
	New storage/pumping stations	
	New intermediate well	—
	Maintain all existing wells	○

**Key Considerations:**



**Sustainability of Water Source**

- Lake Michigan is a sustainable source will capacity to meet demands in 2050 and beyond
- Illinois American Water agreement limits MDD:ADD ratio to 1.7
- Illinois American Water agreement requires its customers to receive water at a constant supply rate
- Wells could be kept as emergency backup
- Redundancy of Illinois American Water's existing system is still being evaluated
- Emergency repair protocols are to be determined



## Water Quality & Permitting

- Raw and treated water hardness: approximately 140 mg/L
- Detectable levels of radium not present in Lake Michigan
- Additionally chlorine disinfection likely needed for Lake Michigan water treated by the City of Chicago (Class C Operator License)
- Raw water intake cribs are located approximately two miles off Lake Michigan shore
- Lake Michigan water is seasonally consistent
- IDNR requires Lake Michigan Water Allocation (including non-revenue water and conservation requirements)
- IEPA requires construction and operating permits for new facilities



## Governance & Operational Responsibility

- Illinois American Water is a private utility company
- No direct ownership or control of the source water treatment. No direct control of the operation and maintenance of the distribution infrastructure
- The limits of Illinois American Water infrastructure are still being evaluated



## Timeline

- The timeline is still to be determined, estimated 4-5 years after a decision is made
- It is unlikely that Oswego will require a new well prior to Illinois American Water supply



## Internal System Improvements

- Approximately 7,900 feet of water main improvements for the Village of Oswego
- Additional storage and pumping improvements needed to meet 2050 demands



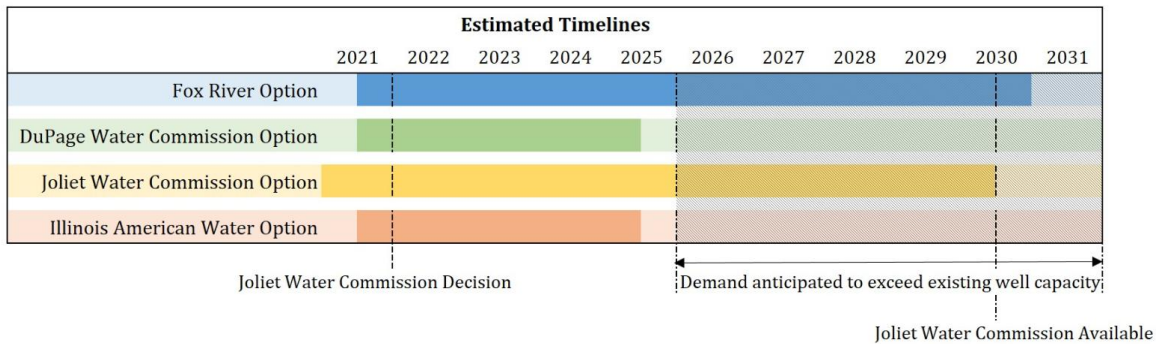
### Key Considerations Side-By-Side Comparison Table

Oswego Key Considerations Table 18June2021 : Sheet1

Criteria	Sub-criteria	Fox River Option	
<b>Sustainability of Water Source (Water Quantity)</b>	Water Quantity	Sustainable source, capable of meeting demands during normal conditions	I v
	Flow Restrictions	Low Flow/Seasonal Quality Flow Restrictions will limit withdrawal	
	Supply Rate	Variable supply rate to meet demands	C
	Backup Wells	Wells required as supplemental/backup supply	
		ISWS models risk of declining well production today and risk of well inoperability as soon as 2030 for Oswego	in
	Redundant raw and treated transmission mains		
	Would need to establish emergency		-

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Oswego Key Considerations Table 18June2021 - Google Drive



		Fox River Option	DuPage Water Commission Option	Joliet Water Commission Option	Illinois American Water Option
<b>Water Supplier</b>	New raw water intake	█	—	—	—
	New water treatment plant	█	—	—	—
	New raw water transmission main	█	—	—	—
	New treated water transmission main	█	█	█	█
	New/existing system upgrades	—	█	█	█
	Backup well network	█	—	—	—
<b>Montgomery, Oswego, Yorkville</b>	New regional well	█	—	—	—
	New receiving stations	█	█	█	█
<b>Oswego</b>	Existing system improvements	█	█	█	█
	New storage/pumping stations	█	█	█	█
	New intermediate well	█	—	█	—
	Maintain all existing wells	—	○	○	○

Summary of Required Infrastructure





Future parts of the Study will address the following:

- Conservation measures
- Cost estimates
- Funding alternatives
- Joint public information meeting

It is critical that the chosen water source is able to provide a sufficient amount of reliable, safe drinking water to the three communities through 2050 and beyond.

**Baxter & Woodman, Inc.**

2021