

Joliet Alternative Water Source Program

August 25, 2020 City Council Workshop







Allison Swisher City of Joliet



Joe Johnson Stantec



Theresa O'Grady Crawford, Murphy & Tilly

WORKSHOP AGENDA

Presentation – Alternative Water Source Program Update & Workshop Goals – Allison Swisher, City of Joliet	(10 minutes)
Presentation – Governance Strategy for a Regional Water Option – Allison Swisher, City of Joliet	(15 minutes)
Group Discussion – Governance Strategy for a Regional Water Option	(20 minutes)
Presentation – Water Treatment Process Evaluation – Joe Johnson, Stantec	(10 minutes)
Group Discussion – Water Treatment Process Evaluation	(15 minutes)
Presentation – Level 1 Water Transmission Main Routing Evaluation – Theresa O'Grady, Crawford, Murphy & Tilly	(10 minutes)
Group Discussion – Level 1 Water Transmission Main Routing Evaluation	(15 minutes)

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- Update City Council on **progress** and **schedule** for the 2020 Alternative Water Source Evaluation
- Obtain City Council comment and concurrence on recommendations for
 - Regional Water System Governance
 - Water Treatment Process for new Indiana Intake Alternative
 - Water Transmission Main Routing



Alternative Water Source Program Update

Allison Swisher, City of Joliet

PROGRAM SCHEDULE

2020

Alternative Evaluation and Final Selection

2021

Preliminary Design

2022-2024 Final Design

2025-2030

Construction

NOVEMBER 2020

City Council Workshop to present Prospectus for each alternative

DECEMBER 2020

Public Forum & City Council decision on alternative water source

DECEMBER 2021

Finalize participants in regional water system



EFFORTS IN PAST MONTH (JULY)



- Meetings with water supply/water access providers – Chicago, Hammond
- ✓ Stakeholder Meeting #2 July 30th
- ✓ Regional Governance Evaluation
- Level 1 Transmission Main Routing
 Study
- ✓Indiana Intake Siting Study
- ✓ Lake Michigan Raw Water Quality Evaluation

- Corrosion Control Evaluation Data Collection
- Meetings with potential regional partners

- ✓ Ongoing:
 - Governmental Outreach Illinois, Indiana, Federal (biweekly meetings)
 - Public Outreach billboards, eblast, Monthly educational Topics, Monthly Newsletter
 - Monthly Joliet Financial Team Meetings

EFFORTS IN THIS MONTH (AUGUST)



 Meetings with water supply/water access providers – Chicago, Hammond, Gary, Whiting, Southland Water Agency

- Transmission Main Workshop August 4th
- Regional Governance Workshop –
 August 5th
- ✓ Finance Committee Presentation August 18th

Corrosion Control Evaluation – Existing System Analysis

✓ Water Treatment Process Evaluation Study

- Meetings with potential regional partners
- ✓ City Council Workshop #2 August 25th

✓Ongoing:

- Governmental Outreach Illinois, Indiana, Federal (biweekly meetings)
- Public Outreach billboards, eblast, Monthly educational Topics, Monthly Newsletter
- Monthly Joliet Financial Team Meetings

EFFORTS PLANNED FOR NEXT MONTH (SEPTEMBER)



- Weekly Meetings with water supply/water access providers – Chicago, Hammond, Gary, Whiting
- Stakeholder Meeting #3
- Level 2 Transmission Main Routing Study
- Lake Michigan Allocation Application

• Meetings with potential regional partners

- ✓ Ongoing:
 - Governmental Outreach Illinois, Indiana, Federal (biweekly meetings)
 - Public Outreach billboards, eblast, Monthly educational Topics, Monthly Newsletter
 - Monthly Joliet Financial Team Meetings



Get Involved in 2020

- Sign up for the mailing list
- Visit the website at <u>www.RethinkWaterJoliet.org</u>
- Attend public meetings

- Learn more monthly educational topics
- Follow progress monthly newsletters
- Help spread the word



QUESTIONS?



www.RethinkWaterJoliet.org



Governance Strategy for a Regional Water Option

Allison Swisher, City of Joliet

REGIONAL PROBLEM

The existing water source for the City of Joliet and the region, the deep sandstone aquifer, is being depleted at the current usage rates and is not sustainable. This is a regional problem – with the potential for a regional solution.



2050 – Peak Pumping (Joliet off aquifer)



WHO ARE THE POTENTIAL REGIONAL PARTNERS?

For Lake Michigan – New Indiana Intake Alternative, what about potential regional partners to the east?



REGIONAL WATER SYSTEM DEVELOPMENT

Regional Outreach

Regional Governance Evaluation

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REGIONAL OUTREACH

- Meetings between **potential regional community** participants, Joliet Staff and consultant team members
- As of 08/17/20, **13 communities expressed interest** in continuing discussions on a regional water supply
 - 11 of the 13 regional communities preferred that a commission be formed (versus Joliet selling water to them as a wholesale customer)
 - Remaining 2 regional communities did not have a preference on governance structure

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REGIONAL GOVERNANCE EVALUATION

- Prepared by Joliet's Special Legal Counsel, Barbara Adams, Donahue & Rose
- Investigated water system governance structures currently available by state statutes and their **advantages/disadvantages**

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MAJOR TYPES - WATER ENTITIES



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KEY FEATURES OF EACH WATER ENTITY TYPE



CREATION OF WATER ENTITIES **AND MEMBERS**



POWER TO SET RATES AND SELL WATER



GOVERNING BODIES AND VOTING



FINANCING AND BONDS



WITHDRAWING **MEMBERS**



LAND ACQUISITION



TERRITORY OF THE WATER ENTITY



DISSOLUTION



CONSTRUCTION & **ACQUISITION OF** WATER SUPPLY



REGULATORY **OVERSIGHT**

REGIONAL GOVERNANCE

- Form **Water Commission**, based on Division 11-135 of the Illinois Municipal Code with modifications (requiring new state legislation)
- Benefits of a regional water commission:
 - Lower water rates due to cost sharing and economies of scale
 - Distribution of risk amongst more entities
 - Support of state and federal agencies such as IEPA and USEPA as well as state and federal legislators
 - Ability to **obtain access for construction in rights-of-ways** outside of the limits of the City of Joliet

RECOMMENDATION – MODIFICATIONS TO WC

Commission Board Make-up

- Representatives from **each** member community
- Number of representatives from each community based on Maximum Day Demand (MDD)

Proportional Voting Rights

- Based on member's MDD in relation to total system capacity
- Utilized for **certain decisions** that have greater financial impact, such as setting of rates, borrowing of funds and sale of assets
- Supermajority voting

NEXT STEPS

Continue discussions with potential regional communities

Discuss and agree on details related to forming a water commission:

Mechanism for Commission management Availability of decisions that Start-up of the system possible future **Operation** of **Delineation of** require Rates: O&M financing, design and the water water system ownership of proportional and capital capital costs construction to capacity and commission infrastructure and member and costs provide water methodology infrastructure supermajority contributions delivery by for payment voting 2030

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TIMELINE

August – December 2020:

Continue regional outreach and discussions regarding Water Commission governance

December 2020:

City Council selection of water source alternative

January – December 2021:

Develop rate structure and governance for Water Commission based on selected water source alternative

July – December 2021:

Begin legislative process to amend Water Commission statutes

January - March 2022:

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Approve resolution establishing water commission, followed by approval of a water purchase and sale agreement between the Commission and its members



GROUP DISCUSSION Governance Strategy for a Regional Water Option



• Are there any questions that you have regarding the evaluation presented?



 Do you have any comments regarding the recommendation and next steps?



Water Treatment Process Evaluation

Joe Johnson, PE, PMP, Stanted



TREATMENT PROCESS EVALUATION

Why is an evaluation of water treatment processes required?

New intake alternative would require construction of a new surface water treatment plant for Joliet Treatment process must be selected to meet regulatory requirements and local expectations for water quality and aesthetics

Process selection will affect estimated capital and operating & maintenance costs

PROCESS SELECTION CONSIDERATIONS

What factors are important to the selection of a water treatment plant process and why?

- Removal and/or inactivation of pathogens
- Minimization of disinfection by-products formation
- Minimization of bacterial regrowth in the distribution system
- Effective removal of objectionable taste and odor causing agents
- Ability to remove emerging contaminants such as algal toxins, PFAS, hexavalent chromium and microplastics

TREATED WATER QUALITY GOALS

Desired characteristics of treated water (full table on page 6 of treatment process evaluation memo)



Parameter	Unit	IEPA Requirements	Treated Water Goal	
Iron	µg∕L	300	< 5	
Manganese	µg∕L	50	< 20	
Odors	TON	3	Non-detect	
Tastes	-	None	Not objectionable	
Synthetic Organic Chemicals	µg/L	Varies by chemical	Non-detect	
Disinfection Byproducts				
ттнм	µg∕L	80	40	
HAAS	µg∕L	60	30	
Bromate	µg∕L	10	5	
Corrosion Parameters				
Lead	µg∕L	15	< 10	
Copper	mg/L	1.3	< 1	

EMERGING CONTAMINANTS



- Per- and polyfluoroalkyl substances (PFAS)
- Microplastics
- Hexavalent Chromium
- Algal Toxins
- Pharmaceuticals/Personal Care Products





WTP PROCESS ALTERNATIVES



Alternative 1	Alternative 2	Alternative 3	
High Rate Conventional Treatment	Membrane Filtration with Pre-Clarification	Advanced Water Treatment	
 Powdered activated carbon (T&O) 	 Powdered activated carbon (T&O) 	 Flocculation and clarification 	
 Flocculation and clarification 	 Flocculation and clarification 	 Ozonation 	
 Dual media filters Chlorine contact Existing installations Chicago Evanston Hammond 	 Microfiltration Chlorine contact Existing installations Highland Park East Chicago 	 Granular activated carbon filtration Chlorine contact Existing installations CLCJAWA 	

COST COMPARISON



		Alternative 1 Conventional	Alternative 2 Membrane Filtration	Alternative 3 Advanced Treatment
	Opinion of Probable Construction Cost	\$112 Million	\$127 Million	\$126 Million
Joliet Only Water Supply	Annual Operating & Maintenance Cost	\$2.9 Million	\$3.5 Million	\$3.1 Million
Option (30 MGD)	Net Present Value (NPV) of Annual O&M ¹	\$50 Million	\$60 Million	\$55 Million
	30-Year NPV	\$162 Million	\$187 Million	\$181 Million

Note:

1. NPV of annual O&M is based on a period of 30 years, discount rate of 4% and NPV factor of 17.3

NON-COST CONSIDERATIONS



Evaluation Criteria	Alternative 1 Conventional	Alternative 2 Membrane Filtration	Alternative 3 Advanced Treatment
Finished Water Quality	0	ο	++
Process Complexity and Reliability	+	ο	ο
Demonstrated Lake Michigan Experience	+	ο	+
Electrical Power Requirements	+	-	ο
Regulatory Considerations	0	ο	+
O&M Requirements	+	-	-
Worker Safety	+	+	Ο
Residuals Management	Ο	ο	ο
Pilot Testing	+	ο	-

WTP PROCESS **RECOMMENDATION**: **ADVANCED** WATER TREATMENT





Key considerations:

- Meets all treated water quality goals
- Provides treatment for emerging contaminants
- Most effective taste and odor control treatment



NEXT STEPS

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August – December 2020:

Conceptual design of Advanced WTP and development of updated costs December 2020: City Council selection of

water source

alternative

January – December 2021:

Site selection and preliminary design of new WTP if New IN alternative selected 2022: Pilot Testing of Treatment Process 2022 - 2024:

Detailed design and permitting of water treatment plant



GROUP DISCUSSION

Water Treatment Process Evaluation



• Are there any questions that you have regarding the evaluation presented?



 Do you have any comments regarding the recommendation and next steps?



Level 1 Transmission Main Routing Evaluation

Theresa O'Grady, Crawford, Murphy & Tilly

TRANSMISSION MAIN ROUTING



- Both alternatives have a significant length of transmission main required (30 to 47 miles) ranging in diameter from 48" (Joliet only) to 66" (Joliet plus some regional communities)
- Majority of transmission main to be constructed **outside of City limits**
- Starting point at source (CDWM, Indiana) and ending point at Joliet receiving station
- Cannot go in a straight line; need to follow existing right-of-ways or corridors
- Goal Refine and optimize route to develop updated cost estimates



2020 TRANSMISSION MAIN EVALUATION



- Collection of Route/Corridor Information
- Development of **GIS** Database
- Level 1 Routing Study
- Presentation of Level 1 Routing Study recommendations (today)
- Level 2 Routing Study
- Incorporation of Level 2 Routing Study recommendations into Basis of Design Report



EVALUATION GOALS



Level 1 Analysis

- Identify additional potential routes and evaluate them at a high level based on information obtained through discussions with permitting entities along each route.
- Each potential route is **rated using cost**, **complexity and risk ratings**, and then compared against the other potential routes in order to provide a quantitative basis for selecting one route for each alternative to move into the Level 2 Analysis.

Level 2 Analysis

 Further study the corridor along each Level 1 recommended route using the Level 1 criteria with the addition of parameters such as major utilities, environmental concerns (wetland, floodplain, endangered species), contaminated soils, traffic count and railroad crossings.

LEVEL 1 TRANSMISSION MAIN ANALYSIS

- Gathered **typical permitting data** from agencies along the potential routes
- Identified additional potential routes
- Developed evaluation criteria
- Evaluated routes using a **criteria matrix**



LEVEL 1 ROUTES FOR BOTH ALTERNATIVES



LEVEL 1 EVALUATION CRITERIA



- Evaluation criteria categories:
 - Cost
 - Length
 - Risk
 - Bedrock
 - Private parcels
 - Ownership type
 - Flexibility for alternate routes
 - Permitting entities
 - Opportunity for added water population





SUMMARY OF LAKE MICHIGAN – CDWM ALTERNATIVE ROUTES

	Route 1 (ComEd and Local Road)	Route 2 (ComEd, Forest Preserve and Local Roads)	Route 3 (65% IDOT Roads)	Route 4 (80% IDOT Roads)	Route 5 (Local Roads, Forest Preserve and IDOT Roads)
Total Score (Sum of All Weighted Ratings)	6.0	7.0	-1.0*	-6.0	-7.0

*While a score has been shown for this Route, IDOT has indicated that this route would only be allowed if there is no other feasible route.



SUMMARY OF LAKE MICHIGAN – NEW INDIANA INTAKE ALTERNATIVE ROUTES

	Route 1 (ComEd Corridor)	Route 2 (Interstate IDOT Roadway)	Route 3 (Local Roads)	Route 4 (Bike Path Corridor)
Total Score (Sum of All Weighted Ratings	6.0	**	4.0	3.0

**While Route 2 (Interstate IDOT Roadway) was included in the Level 1 Analysis, IDOT has indicated that it would not allow for construction of the transmission main in Interstate IDOT Right-of-way under any circumstances. Therefore, a score has not been shown for this route.

RECOMMENDED LEVEL 2 ROUTE/CORRIDOR



For Lake Michigan Water -CDWM Alternative:

• Evaluate Route 2 (ComEd, Forest Preserve and Local Roads). However, if after meeting with Cook County Forest Preserve, the watermain routing is not feasible, Route 1 (ComEd and Local Roads), which is a variation of Route 2, should be evaluated.

Lake Michigan Water – New Indiana Intake Alternative:

• Evaluate Route 1 (ComEd Corridor) corridor which includes Route 4 (Bike Path Corridor) as it is parallel and within 0.5 to 1 miles of Route 1 (ComEd Corridor).

RECOMMENDED LEVEL 2 ROUTE/CORRIDOR

Hickory Hills

Palos Hills

Palos Park

Orland Park

Mokena

Frankfort

Willow Springs

Lemont

Lockport

Homer Glen

New Lenox

Bridgeview

Burbank

Chicago Ridge

Worth

Palos Heights

Index Park

Tinley Park

Hometown

Oak Lawn

E-mprom Part

Markhows

Hazel Crest

Corregia Planta

University Park

Park Forest

Homewood

Glenwand

Crete

Chicago Heights

outh Chicago Heigh

ountry Club Hills

Matteson

Richton Park

Chicago

Lansing

Sauk Villag







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NEXT STEPS

August – October 2020:

Complete Level 2 Transmission Main Analysis October – November 2020:

Incorporate Level 2 Analysis and recommendations into Basis of Design Report and Prospectus for each alternative December 2020: City Council selection of water source alternative January – December 2021:

Perform 2021 Routing Study taking into consideration utilities, right-of-way congestion, survey data, outreach to municipalities along route, public (residential /commercial) impact and land acquisition

December 2021:

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Recommendation of Transmission Main **Preliminary Alignment** to move into Final Design in 2022



GROUP DISCUSSION

Level 1 Transmission Main Routing Evaluation



• Are there any questions that you have regarding the evaluation presented?



 Do you have any comments regarding the recommendation and next steps?



Questions?