Alternative Water Source Study

Village Board Workshop

January 22, 2022

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WATER SUPPLY OBJECTIVES

SUSTAINABLE

REGULATORY COMPLIANT

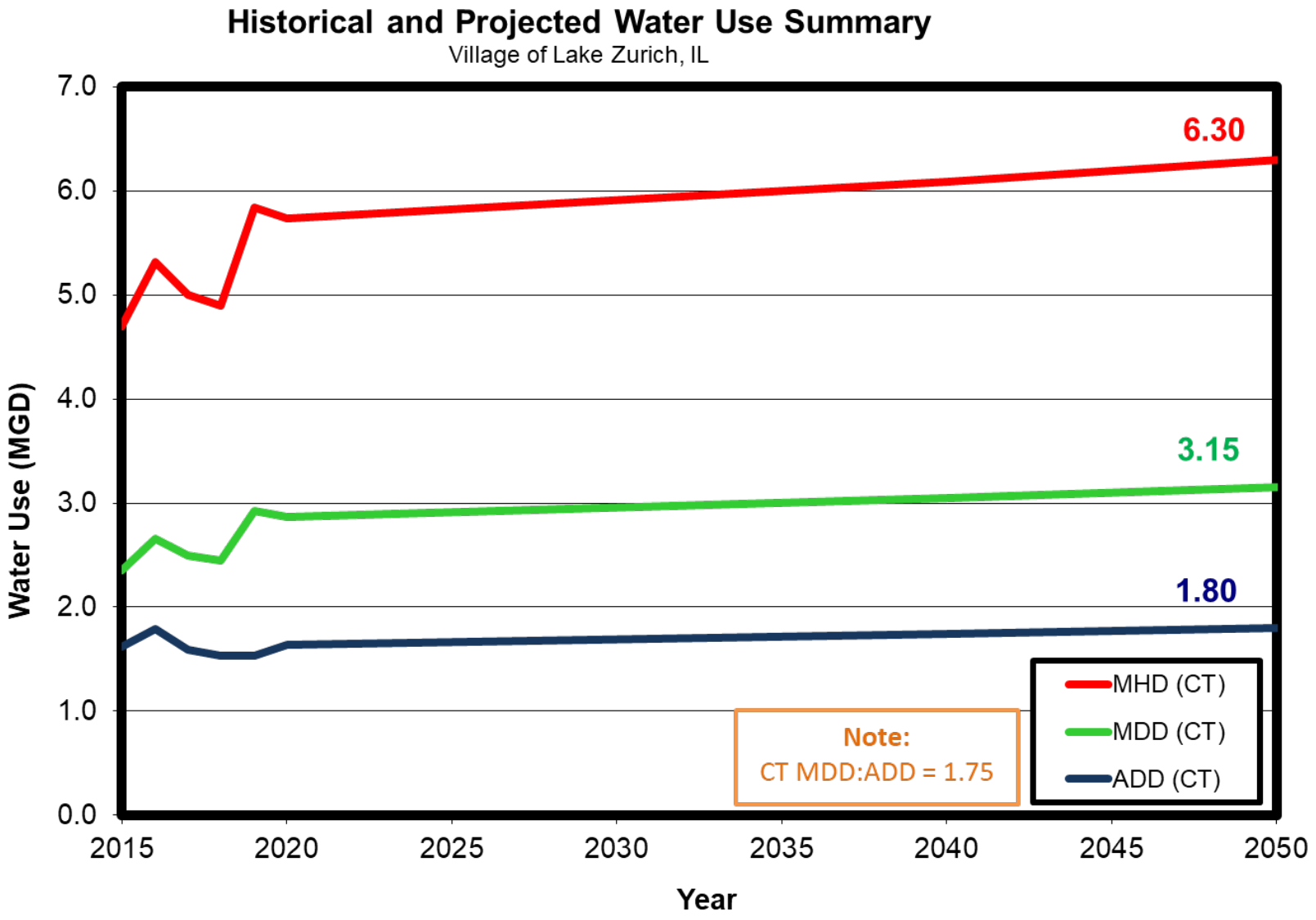
HIGH QUALITY

COST EFFECTIVE

Agenda

1. Opening Remarks
2. Village of Lake Zurich Alternative Water Source Study Recap
3. Financial Overview
4. Decision Matrix
5. Additional Discussion
6. Board Direction

RECAP



Projected Water Demands

- Projected MDD:ADD Ratio: 1.75
- Projected Water Use Per Person in 2050: 75 gpcd

Summary and Application – Deep Sandstone Aquifer Sustainability

HISTORIC TRENDS AND CURRENT STATUS

Significant Depletion of the Water in the St. Peter and Ironton-Galesville Aquifers

Slight Recovery in Deep Aquifers Since 1980's Due to Decreased Usage (Increased Regional Usage of Lake Michigan)

Current Status – Aquifers Are Adequate for Village's Use

PROJECTED TRENDS

Water Levels in the Deep Sandstone Aquifers are Projected to Decline

Highly Dependent on Regional Development and Usage of the Aquifers

Lake County Demand for Water From Deep Aquifers is Greater Than Replenishing Supply

Implications to Village: Short-Term Sustainability Adequate, but Long-Term (30+ Years) Sustainability a Concern

Groundwater Treatment Overview

St. Peter & Ironton-Galesville Sandstone

Naturally Occurring
Radium & Barium

Village's Treatment

- Cation Exchange
- Removes Radium, Barium and Hardness (Softens Water)
- Sends Radium and Barium to Lake Co. PW

Radium Removal - Regulations

- USEPA/IEPA – 5.0 pCi/L MCL
- Established in Early 2000's
- Impacted Many CWS' in NE IL

Radium Removal - Technologies

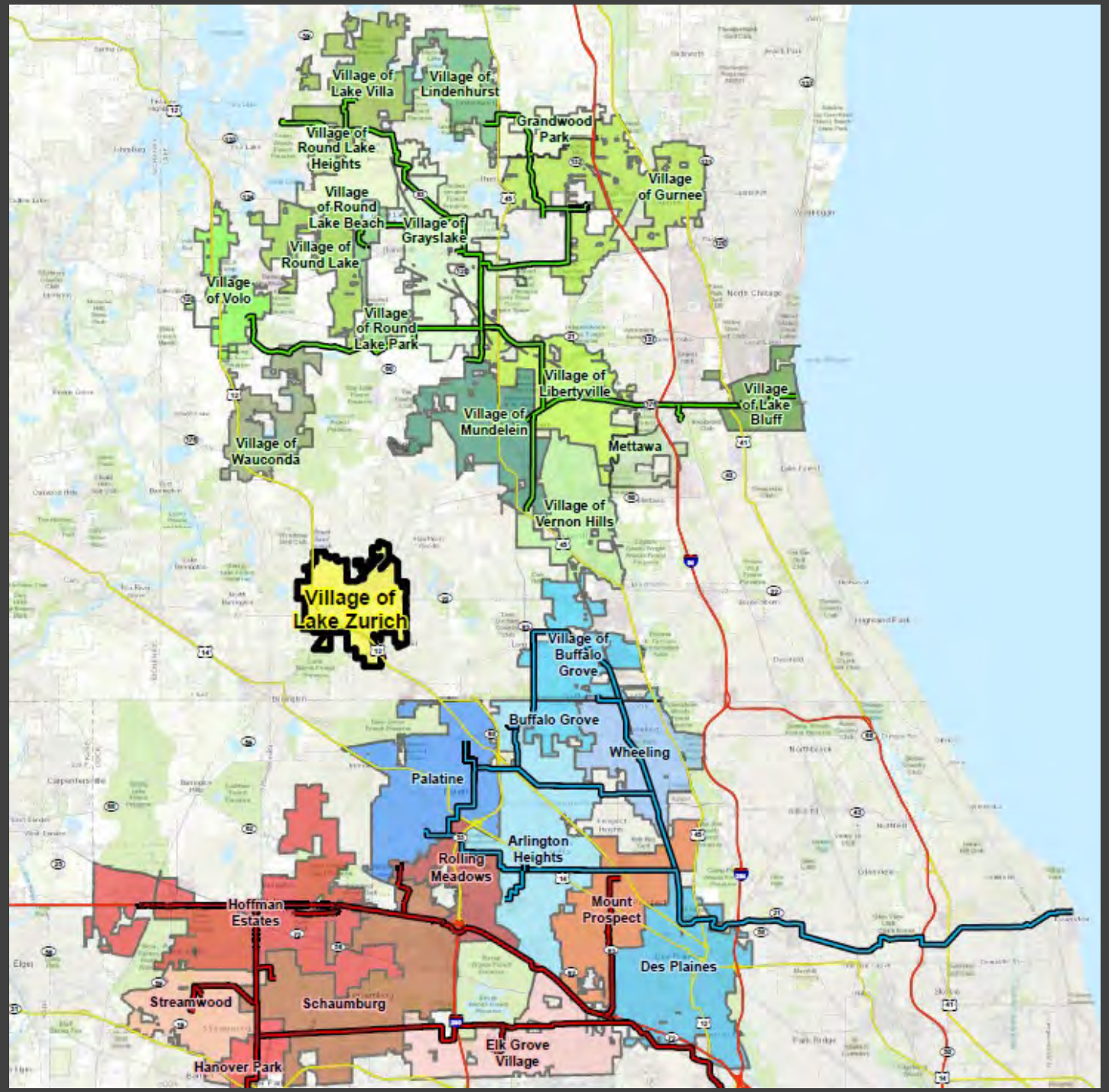
- Best Available Technologies
  - ✓ Cation Exchange
  - ✓ Lime Softening
  - ✓ Membranes (Reverse Osmosis)
- Other
  - ✓ HMO
  - ✓ Radium Selective Media

Well No. 7 & Water Treatment Plant

- Concerns About Viable Long-Term Reliability
  - ✓ Oldest Well and WTP
  - ✓ Next to School
  - ✓ Distribution System Issues During Facility Operations
  - ✓ Electrical and Process Issues

- WRT Pretreatment Option – Requires Continued Usage of Well 7 & WTP or Replacement
  - ✓ Recommendation to Replace Well 7 & WTP with New Well 13 and Cation Exchange WTP with WRT Pretreatment

Decision Component	Pretreatment	Replacement			Treatment/Handling of Waste		
	WRT Radium Selective Media	WRT Radium Selective Media	Lime Softening	WesTech SPIRALATOR	iquid Haulin	Solid Separation and Settling	Gilberts Solid Separation Design
Project Costs							
Capital Cost	$$$	$	$$$	$$$	$$$	$$$	$$$
Annual O&M Cost	$$	$$	$$$	$$	$$$	$$	$$
Total Present Worth Cost	$$$	$$	$$$	$$$	$$$	$$$	$$$
Water Quality							
Anticipated Change to Finished Water Quality	↔		↑	↔	↔	↔	↔
Operation and Maintenance							
O&M Responsibility	1	1	3	3	1	3	3
Risk							
Implementation Difficulty (Short Term Risk/Permitting)	✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Long Term Risk/Reliability/Regulatory Concerns	✓✓✓	✓✓✓	✓✓	✓✓✓	✓✓	✓✓✓	✓✓✓
Timing							
Piloting/Testing/Corrosion Control Study	⏱⏱	⏱⏱⏱	⏱⏱⏱	⏱⏱	NONE	⏱⏱⏱	⏱⏱⏱
Schedule of Implementation	⏱⏱	⏱⏱	⏱⏱⏱	⏱⏱⏱	⏱⏱	⏱⏱⏱	⏱⏱⏱

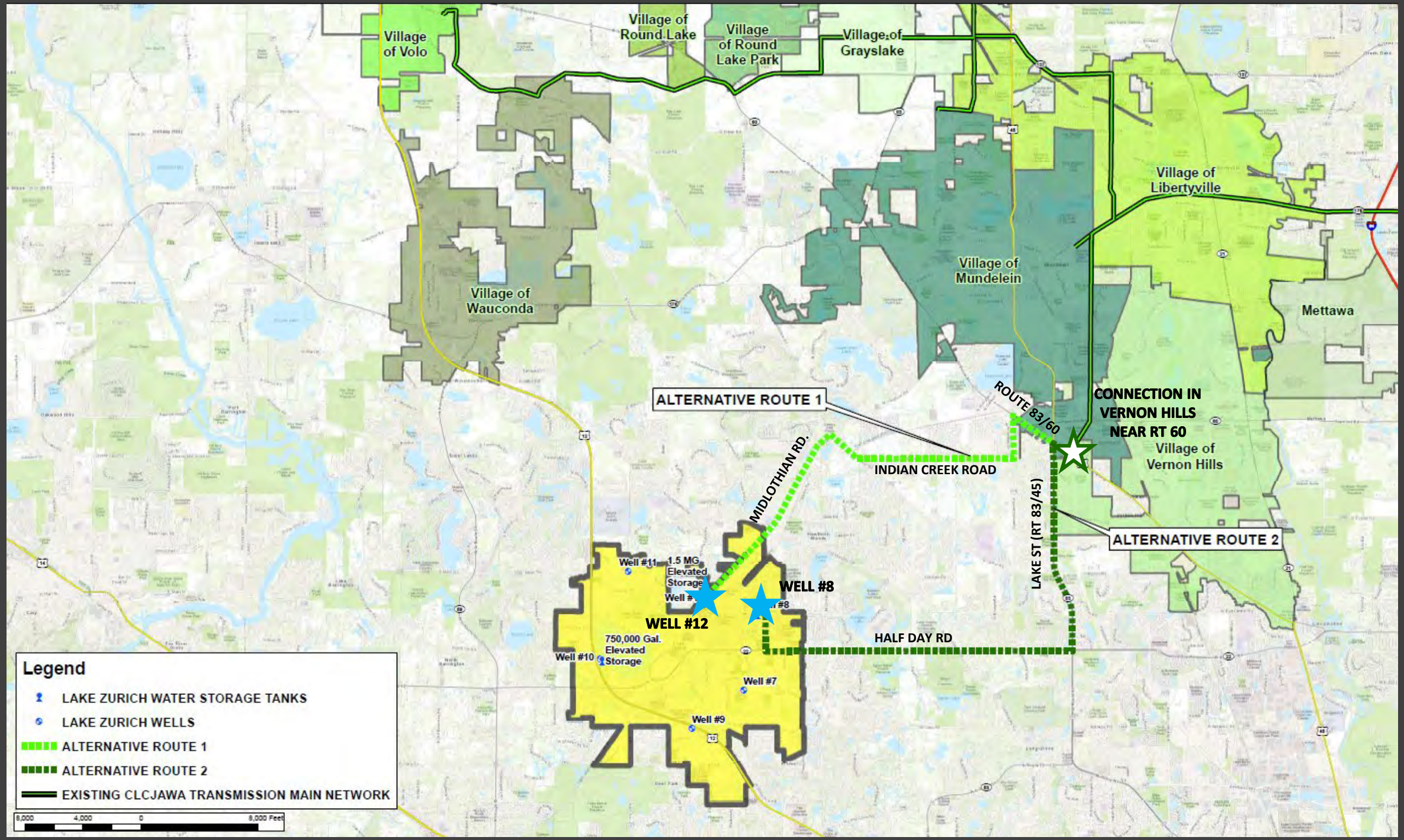


Lake Michigan (LM) Supplier Options

Legend

Lake Michigan Water Source

- Central Lake County JAWA (From Lake Bluff)
- Northwest Water Commission (From Evanston)
- Northwest Suburban Municipal JAWA (From Chicago)
- CLCJAWA Transmission Main
- NWC Transmission Main
- NSMJAWA Transmission Main


Village of Volo
Village of Round Lake
Village of Round Lake Park
Village of Grayslake
Village of Libertyville
Village of Mundelein
Village of Wauconda
Mettawa
Village of Vernon Hills
ALTERNATIVE ROUTE 1
ROUTE 83/60
CONNECTION IN VERNON HILLS NEAR RT 60
INDIAN CREEK ROAD
MIDLOTHIAN RD.
LAKE ST (RT 83/45)
ALTERNATIVE ROUTE 2
Well #11
1.5 MG Elevated Storage
WELL #8
WELL #12
750,000 Gal. Elevated Storage
Well #10
HALF DAY RD
Well #7
Well #9
Legend
LAKE ZURICH WATER STORAGE TANKS
LAKE ZURICH WELLS
ALTERNATIVE ROUTE 1
ALTERNATIVE ROUTE 2
EXISTING CLCJAWA TRANSMISSION MAIN NETWORK
8,000 4,000 0 8,000 Feet

CLCJAWA

SUMMARY & KEY CONSIDERATIONS

Lake Zurich ranks high on CLCJAWA list for potential new customer (tied for first)

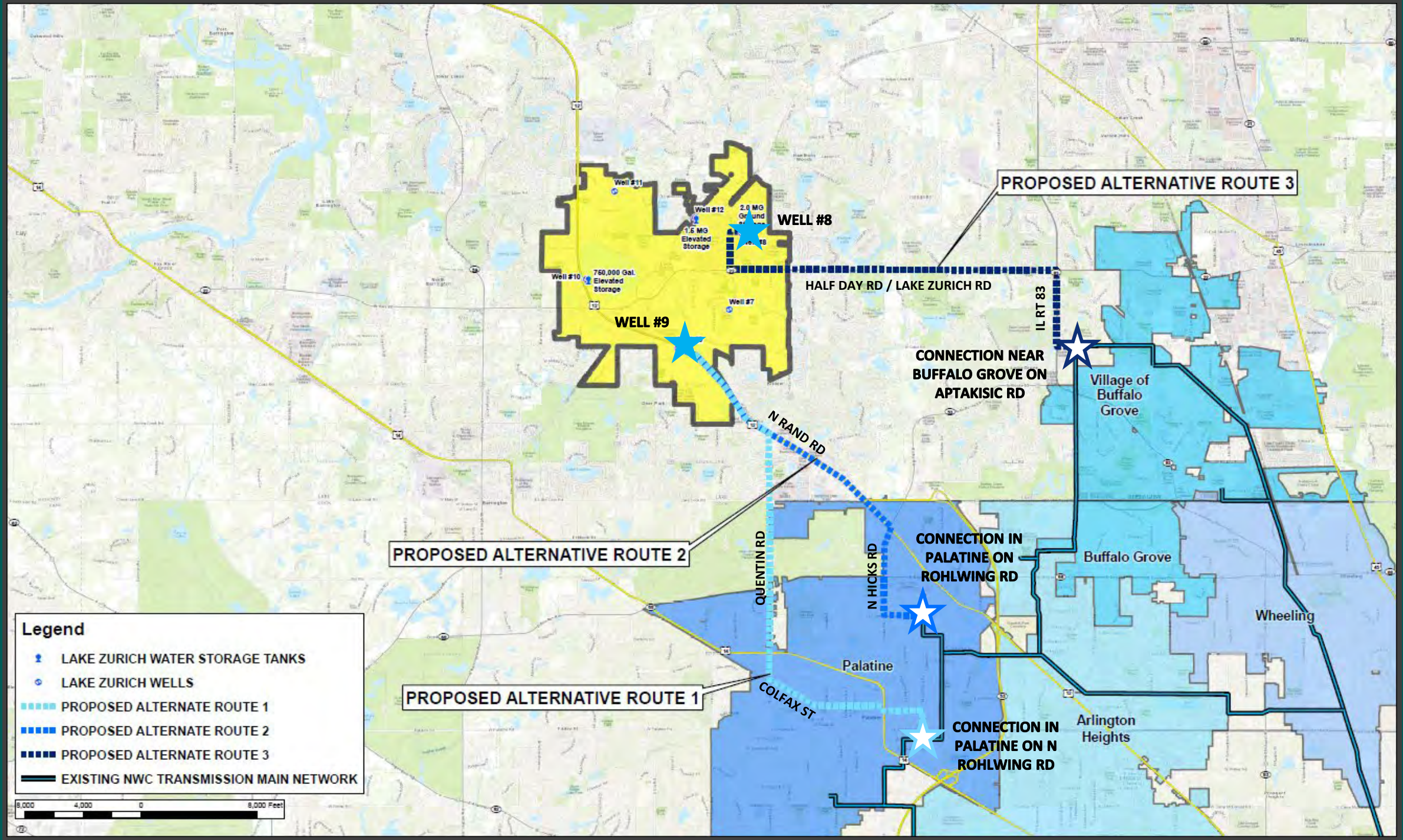
As a Member, Lake Zurich would have to pay an equity buy-in fee that can be financed over 30 years

Excellent Water Quality from Treatment Facility

Lake Zurich would have to upsize transmission main diameter for future downstream communities

Direct Purchase of Water from the Treatment Facility – Not Through Wholesaler

Would require pumping improvements to increase capacity and pressures, but NO extra storage requirements related to CLCJAWA


PROPOSED ALTERNATIVE ROUTE 3
WELL #8
WELL #9
HALF DAY RD / LAKE ZURICH RD
IL RT 83
CONNECTION NEAR BUFFALO GROVE ON APTAKISIC RD
Village of Buffalo Grove
N RAND RD
PROPOSED ALTERNATIVE ROUTE 2
QUENTIN RD
N HICKS RD
CONNECTION IN PALATINE ON ROHLWING RD
Buffalo Grove
Wheeling
Palatine
PROPOSED ALTERNATIVE ROUTE 1
COLFAX ST
CONNECTION IN PALATINE ON N ROHLWING RD
Arlington Heights
Well #11
Well #12
1.5 MG Elevated Storage
Well #10
750,000 Gal. Elevated Storage
Well #7
Legend
LAKE ZURICH WATER STORAGE TANKS
LAKE ZURICH WELLS
PROPOSED ALTERNATE ROUTE 1
PROPOSED ALTERNATE ROUTE 2
PROPOSED ALTERNATE ROUTE 3
EXISTING NWC TRANSMISSION MAIN NETWORK
8,000
4,000
0
8,000 Feet

NWC

SUMMARY & KEY CONSIDERATIONS

Connection points are relatively close to Lake Zurich (Transmission Main Requirements)

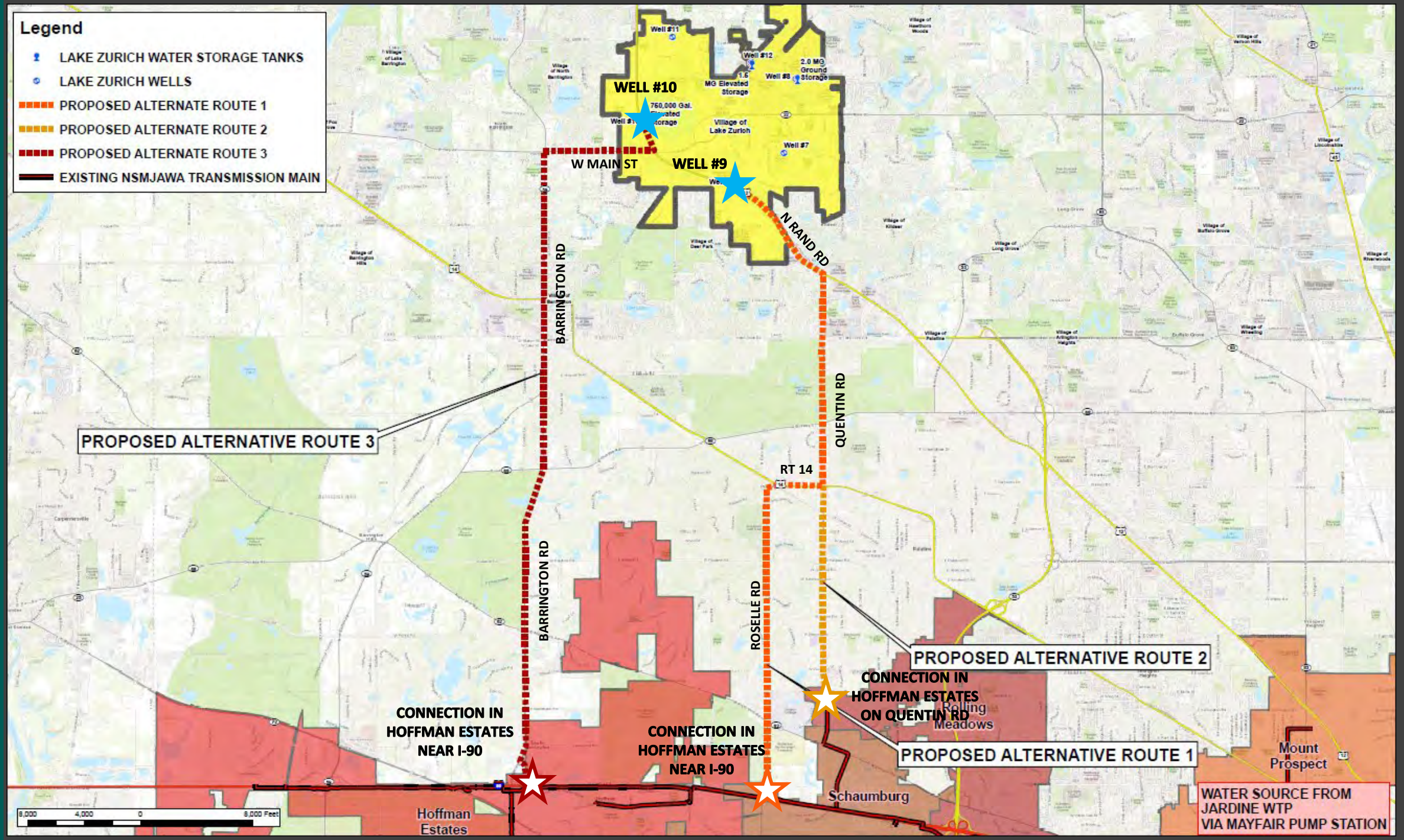
No buy in costs since Lake Zurich is anticipated to join as a customer, but no member representation on Board

Usage is decreasing so open to adding new customers

Potential construction conflicts with proposed routes

Storage addition required

Lowest available capacity out of all three suppliers


Legend
LAKE ZURICH WATER STORAGE TANKS
LAKE ZURICH WELLS
PROPOSED ALTERNATE ROUTE 1
PROPOSED ALTERNATE ROUTE 2
PROPOSED ALTERNATE ROUTE 3
EXISTING NSMJAWA TRANSMISSION MAIN
WELL #10
WELL #9
W MAIN ST
BARRINGTON RD
N RAND RD
QUENTIN RD
RT 14
ROSELLE RD
PROPOSED ALTERNATIVE ROUTE 3
PROPOSED ALTERNATIVE ROUTE 2
PROPOSED ALTERNATIVE ROUTE 1
CONNECTION IN HOFFMAN ESTATES NEAR I-90
CONNECTION IN HOFFMAN ESTATES NEAR I-90
CONNECTION IN HOFFMAN ESTATES ON QUENTIN RD
WATER SOURCE FROM JARDINE WTP VIA MAYFAIR PUMP STATION
Village of Lake Zurich
Well #11
Well #12
Well #8
Well #7
1.5 MG Elevated Storage
2.0 MG Ground Storage
750,000 Gal. Elevated Storage
Hoffman Estates
Schaumburg
Rolling Meadows
Mount Prospect
8,000 4,000 0 8,000 Feet

NSMJAWA

SUMMARY & KEY CONSIDERATIONS

More than adequate capacity to supply Lake Zurich & very interested in obtaining new customers.

No major service disruptions in the past 5 years

Could possibly partner with neighboring community to share transmission main costs.

All connection points are far from Lake Zurich and run along major highways and state routes (IDOT complications)

Additional storage required and would need to be placed within Village limits.

Highest current water rates per 1,000 gallons.

Decision Component	CLCJAWA	NWC	NSMJAWA
Project Costs			
Capital Cost (Including Equity Buy-In)	$$$	$$	$$$
Annual O&M Cost (Including Rates)	$	$	$$$
Total Present Worth Cost	$$$	$$	$$$
Water Quality			
Anticipated Change to Finished Water Quality	⬆⬆	⬆	⬆
Proximity			
Distance to Anticipated Connection Point(s) and Treatment Source	➤	➤	➤➤
Reliability			
Historic and Anticipated Future Reliability for Supply (Disruptions)	✓✓	✓✓	✓✓
Expendability/Capacity			
Supplier's Available Capacity	📊📊	📊	📊📊📊
Control			
Village's Control Over System (Member vs. Customer)	✋✋	✋	✋

FINANCIAL OVERVIEW

Capital Costs - SUMMARY

Groundwater Treatment Capital Costs

SUMMARY	TOTAL ESTIMATED CAPITAL COST[1]
GROUNDWATER PRETREATMENT - RADIUM SELECTIVE MEDIA	$ 23,005,000.00
3.5 MGD SINGLE STAGE (CLARICONE) LIME SOFTENING WATER TREATMENT PLANT	$ 74,784,000.00
REGENERATION WASTE TREATMENT - WESTECH SPIRALATER	$ 15,001,000.00
REGENERATION WASTE TREATMENT - DEWATERING	$ 19,470,000.00

Lake Michigan Suppliers Capital Cost

LAKE MICHIGAN SUPPLY OPTION SUMMARY	TOTAL ESTIMATED CAPITAL COST
CENTRAL LAKE COUNTY - JAWA	$ 76,235,000.00
NORTHWEST WATER COMMISSION	$ 57,129,000.00
NORTH SUBURBAN MUNCIPAL-JAWA	$ 74,994,000.00

O&M Costs- SUMMARY

SUMMARY	TOTAL ESTIMATED OM&R COST	
2020/2021 WATER OPERATIONS COST	$ 2,100,000.00	/year
GROUNDWATER PRETREATMENT - RADIUM SELECTIVE MEDIA	$ 1,287,500.00	/year
3.5 MGD SINGLE STAGE (CLARICONE) LIME SOFTENING WATER TREATMENT PLANT	$ 2,092,272.00	/year
REGENERATION WASTE TREATMENT - WESTECH SPIRALATER	$ 1,504,630.00	/year
REGENERATION WASTE TREATMENT - DEWATERING	$ 1,454,630.00	/year
LAKE MICHIGAN RECEIVING AND DISTRIBUTION (Same for all LM Options)	$ 225,536.00	/year

LM SUPPLIERS - RATES

CLCJAWA

CURRENT RATE

MEMBER: $1.63 / 1,000 Gal.

CUSTOMER: TBD – Likely based upon amortization of capital buy-in fee obligation over 30-years with no interest

PROPOSED RATE

MEMBER: $1.99 / 1,000 Gal. by 2031

CUSTOMER: TBD – Likely based upon amortization of capital buy-in fee obligation over 30-years with no interest

NWC

CURRENT RATE

CUSTOMER
$1.96 / 1,000 Gal.

PROPOSED RATE

Wholesale rates currently being discussed with Evanston; rate increase TBD

NSMJAWA

CURRENT RATE

CUSTOMER
$5.70 / 1,000 Gal.

Customers DO NOT have a set rate; floats each year based on expenses and depends on cost to delivery, includes capital cost and debt service with debt free by 2032

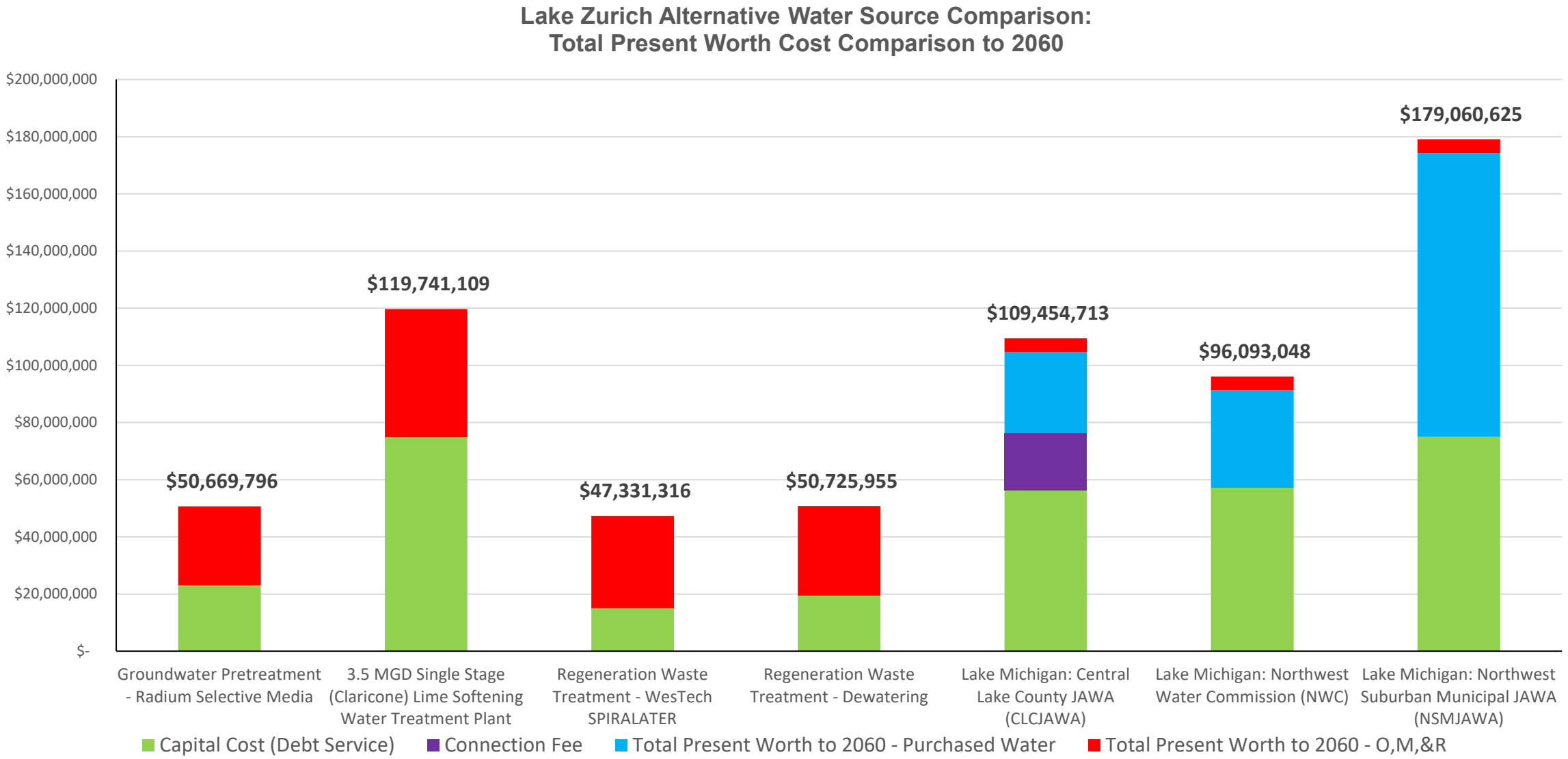
PROPOSED RATE

Potential for future rate of ~$1.50 / 1,000 Gal., pending negotiations/timing with COC

COST OF OWNERSHIP TO 2060

Alternative(s)	Purchased Water (2021)	OM&R Costs (2021)	Connection Fee	Total Present Worth to 2060 - Purchased Water	Capital Cost (Debt Service)	Total Present Worth to 2060 - O,M,&R	TOTAL PRESENT WORTH TO 2060[1]	TOTAL COST INCURRED (SPENT) TO 2060
Groundwater Pretreatment - Radium Selective Media		$ 1,287,500			$ 23,005,000	$ 27,664,796	**$ 50,669,796**	**$ 119,830,973**
3.5 MGD Single Stage (Claricone) Lime Softening Water Treatment Plant		$ 2,092,272			$ 74,784,000	$ 44,957,109	**$ 119,741,109**	**$ 240,477,497**
Regeneration Waste Treatment - WesTech SPIRALATER		$ 1,504,630			$ 15,001,000	$ 32,330,316	**$ 47,331,316**	**$ 125,504,446**
Regeneration Waste Treatment - Dewatering		$ 1,454,630			$ 19,470,000	$ 31,255,955	**$ 50,725,955**	**$ 127,409,698**
Lake Michigan: Central Lake County JAWA (CLCJAWA)	$ 890,327	$ 225,536	$ 20,000,000	$ 28,373,572	$ 56,235,000	$ 4,846,142	**$ 109,454,713**	**$ 145,808,762**
Lake Michigan: Northwest Water Commission (NWC)	$ 1,070,577	$ 225,536		$ 34,117,907	$ 57,129,000	$ 4,846,142	**$ 96,093,048**	**$ 129,183,208**
Lake Michigan: Northwest Suburban Municipal JAWA (NSMJAWA)	$ 3,113,414	$ 225,536		$ 99,220,484	$ 74,994,000	$ 4,846,142	**$ 179,060,625**	**$ 233,552,340**

COST OF OWNERSHIP TO 2060

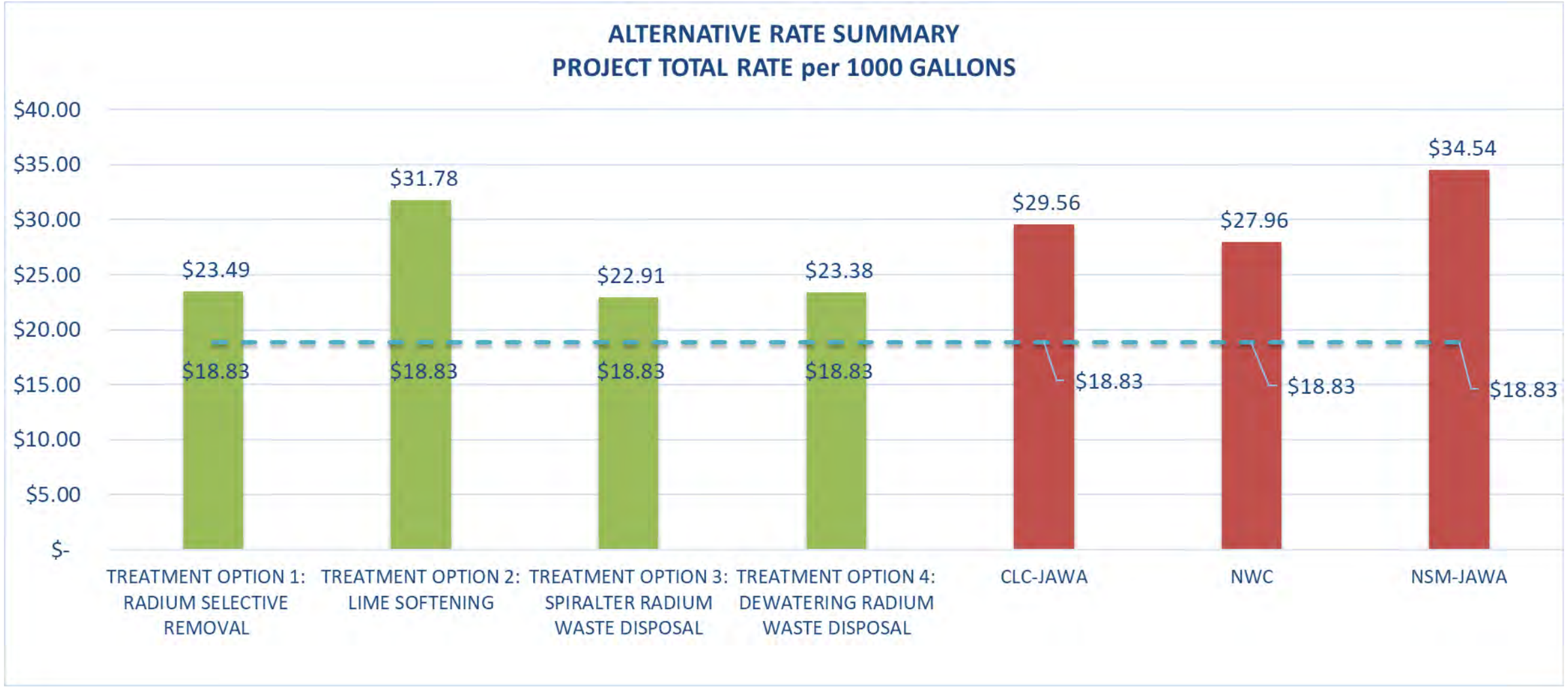


PROJECT RATE IMPACT

RATE IMPACTS PER OPTION	TOTAL RATE /1000 GALLONS
EXISTING TOTAL RATE (Admin, Water, Sewer, Debt Service, Capital Improvements, Lake County)	$ 18.83
Groundwater Treatment Options	
TREATMENT OPTION 1: RADIUM SELECTIVE REMOVAL	$ 23.49
TREATMENT OPTION 2: LIME SOFTENING	$ 31.78
TREATMENT OPTION 3: SPIRALTER RADIUM WASTE DISPOSAL	$ 22.91
TREATMENT OPTION 4: DEWATERING RADIUM WASTE DISPOSAL	$ 23.38
Lake Michigan Water Supply Options	
CLCJAWA	$ 29.56
NORTHWEST WATER COMMISSION	$ 27.96
NSMJAWA	$ 34.54

Based Upon 2021 Rates – Does Not Account For Future Rate Changes

PROJECT RATE IMPACT



Based Upon 2021 Rates – Does Not Account For Future Rate Changes

Funding Options

1. Federal/State Infrastructure Stimulus
2. Loans
    a. WIFIA
    b. IEPA (State Revolving Fund – SRF)
3. Municipal Bonds
4. Local Funding
5. Mix of Options Noted Above

Conclusions

- Costs Presented are Preliminary Estimates and Include 30% Contingency (Conservative)
- Existing Groundwater Pretreatment with Radium Selective Media Lowest Capital and Present Worth Cost
- NWC Lowest LM Supplier Cost Option
- CLCJAWA Comparable Capital Cost to NWC, but Equity Buy-In has Big Impact
- Regardless of Option, There will be Increase to Cost of Water

DECISION MATRIX

MATRIX RANKING CRITERIA

- Project Costs
  - Capital (implementation) Costs
  - Annual O&M Costs
  - Total Project Costs
- Anticipated Finished Water Quality
- Implementation Difficulty (Short Term Risk)
- Operation & Maintenance
- Long Term Risk and Reliability
  - Safety Considerations
  - Future Regulations
- Village Control of Finished Water

- **NOTE: Implementation Schedule <u>Approximately 4-8 Years</u>, Regardless of Option**

Anticipated Finished Water Quality	Implementation Difficulty (Short Term Risk)	Operation & Maintenance	Long Term Risk and Reliability	Control
What is quality and variability of the finished water for this alternative?	Difficult in implementing this alternative (magnitude of improvements, schedule, permitting)?	Does this alternative require significant O&M responsibility or O&M required for improvements outside of the Village?	Does the alternative provide for the most reliable, long-term solution.	For this alternative, does the Village maintain complete control of their water source?
Finished water quality is highly variable due to raw water quality or finished water treatment.	Requires significant modification/upgrade to existing treatment facilities.	New /different/more complex compliance and water quality O&M requirements for the Village.	Risk due to additional requirements (costs) from future water treatment or waste disposal regulations.	Alternative provides control of their finished water.
Finished water quality is better with regards to taste, odor and hardness.	Requires significant modification to existing distribution system (including storage and pumping requirements)	Requires new or additional O&M staff (or less).	Changes in finished water costs, either due to additional treatment regulations or from 3rd party supplier.	Alternative puts control of their finished water into 3rd party.
	Has significant permitting hurdles to implementation	New/different/more complex reporting requirements for the Village.	Lake Michigan Allocation - Village Currently has Allocation to ~2030; 10-Year Re-Evaluations by IDNR	
	Requires New Facilities	O&M poses more/less health and safety concerns for Village Staff	Long-Term Sustainability of Existing Water Source	

Additional Discussion – Decision Matrix

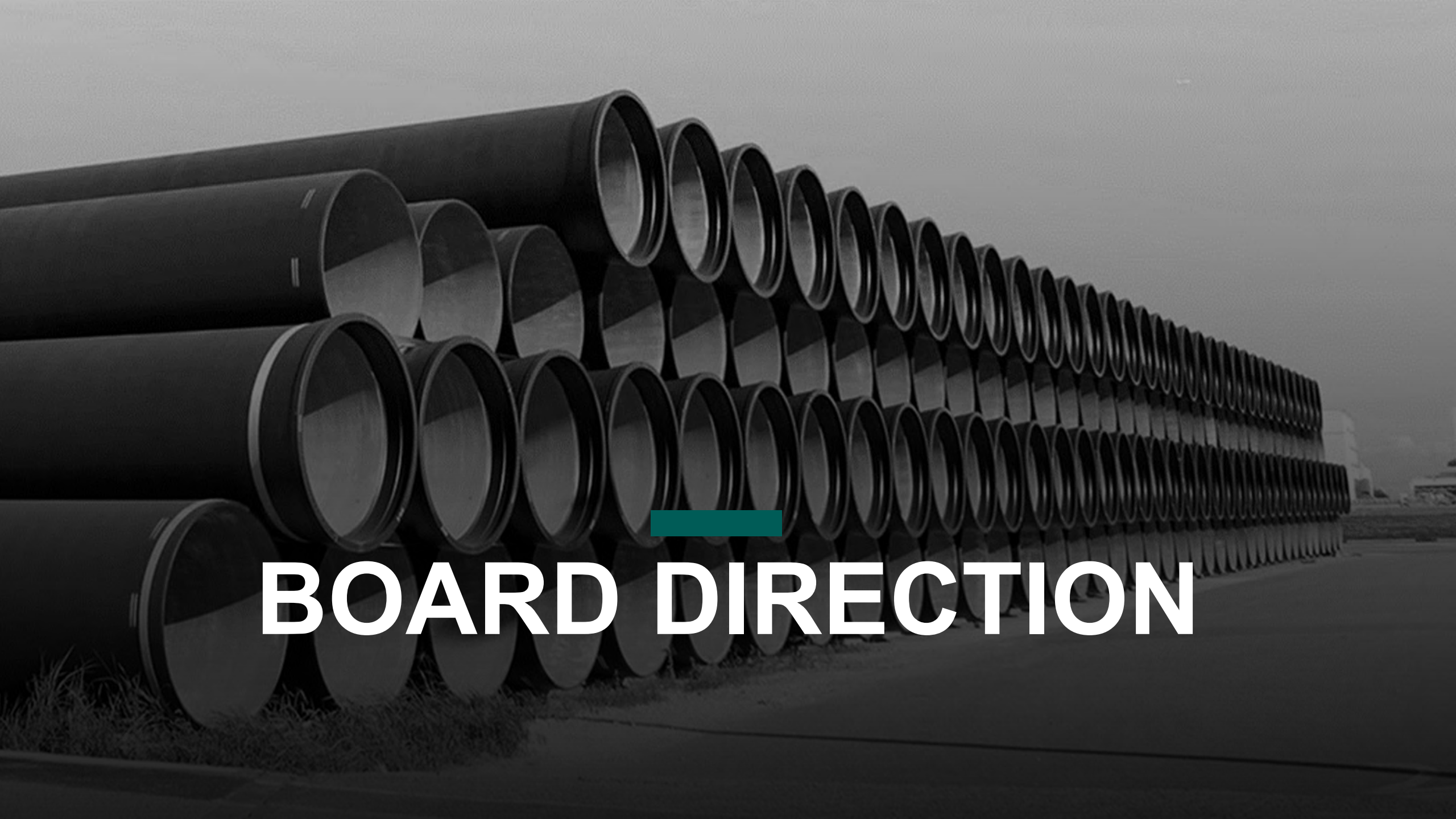
1. Village Staff Have Provided Rankings for Each Alternative and Category – Completed in Matrix

2. Village Board to Provide Weighted Percentages for Each Ranking Category (Rank of Importance to Village)

3. Short-Term and Long-Term Perspectives
   a. Groundwater Sustainability
   b. Regulatory Environment
   c. Implementation Difficulty and Capital Costs
   d. Groundwater Treatment Options More Suited for Short-Term Solution
   e. Lake Michigan Options More Suited for Long-Term Solution

DECISION MATRIX DISCUSSION

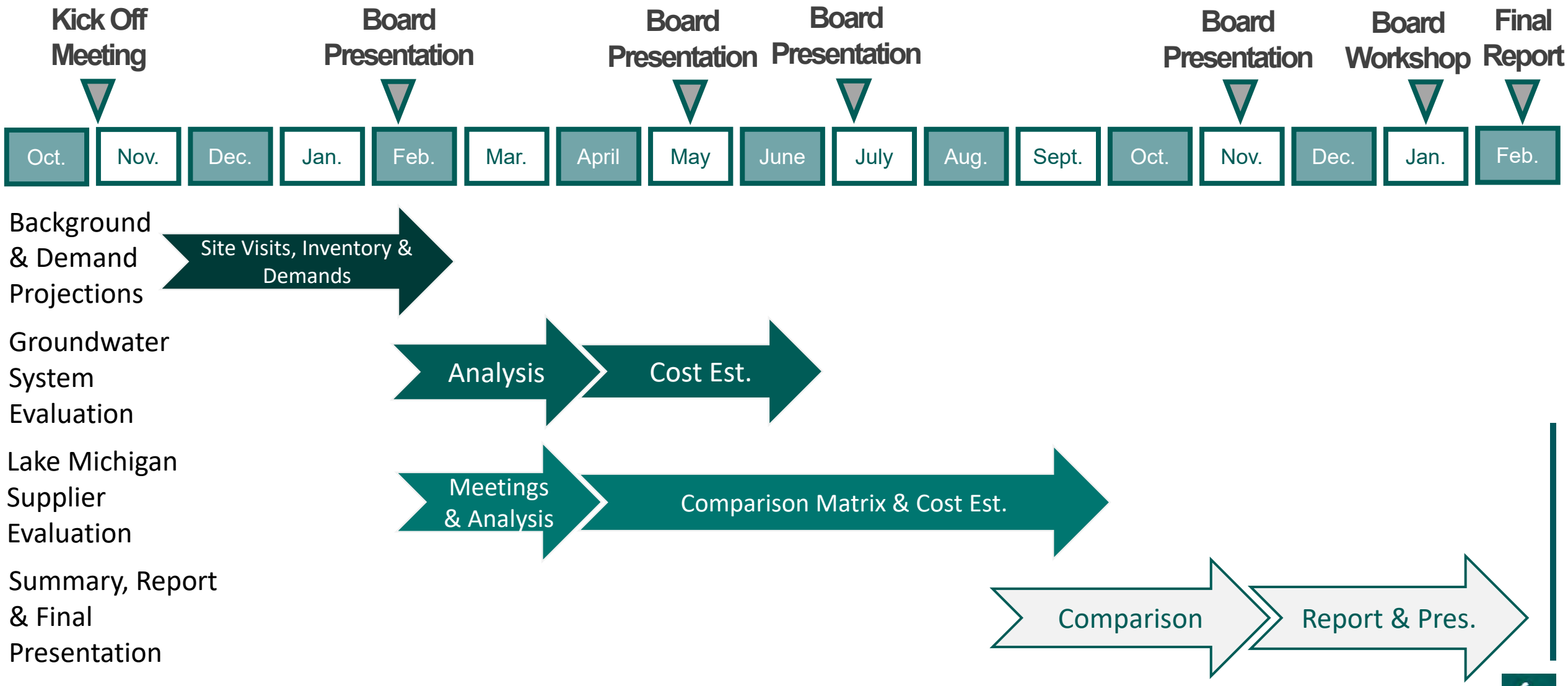
ADDITIONAL DISCUSSION



BOARD DIRECTION

Next Steps

PROJECT SCHEDULE



THANK YOU

We value your time and appreciate the opportunity to present this evening.

Engineering Enterprises, Inc.

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Groundwater Pretreatment – Radium Selective Media

Capital Costs

OPTION 1: GROUNDWATER PRETREATMENT - RADIUM SELECTIVE MEDIA	TOTAL ESTIMATED CAPITAL COST[1]
WELL NO. 7 WATER TREATMENT PLANT	$ 4,488,000.00
WELL NO. 8 WATER TREATMENT PLANT	$ 4,280,000.00
WELL NO. 12 WATER TREATMENT PLANT	$ 4,818,000.00
TOTAL ESTIMATED COST FOR GROUNDWATER PRETREATMENT WITH RADIUM SELECTIVE MEDIA	**$ 13,586,000.00**

O&M Costs

GROUNDWATER PRETREATMENT - RADIUM SELECTIVE MEDIA

ITEM NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT	
1	WELL OM&R	5	$ 104,249.00	$ 521,245.00	/year
2	CATION EXCHANGE AND WRT PRETREATMENT OM&R	3	$ 167,167.00	$ 501,501.00	/year
3	EXISTING CATION EXCHANGE TREATMENT OM&R	2	$ 132,377.00	$ 264,754.00	/year
TOTAL ESTIMATED OM&R COST FOR GROUNDWATER PRETREATMENT WITH RADIUM SELECTIVE MEDIA				**$ 1,287,500.00**	**/year**

3.5 MGD Single Stage (Claricone) LSWTP

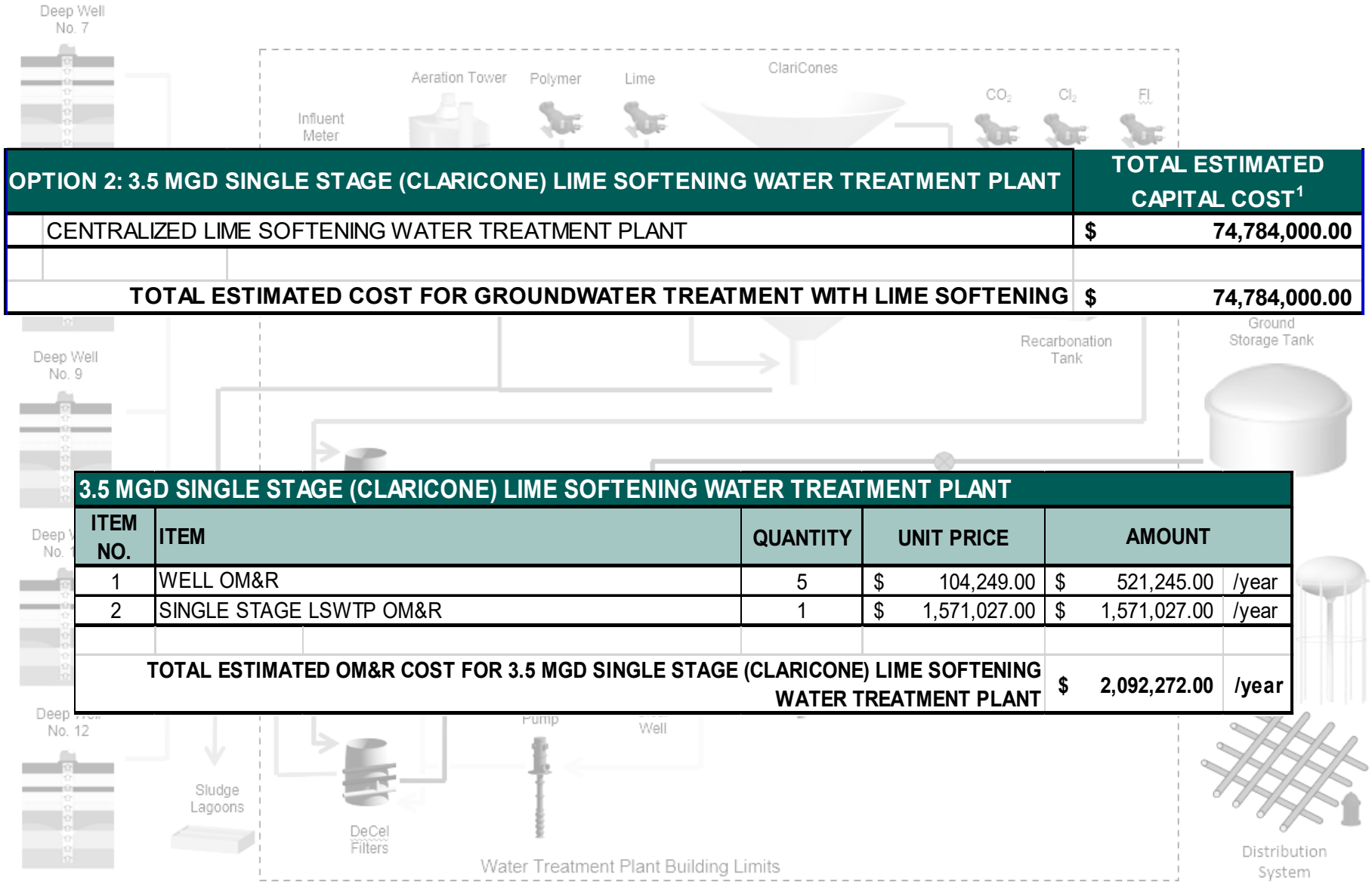
Capital Costs

OPTION 2: 3.5 MGD SINGLE STAGE (CLARICONE) LIME SOFTENING WATER TREATMENT PLANT	TOTAL ESTIMATED CAPITAL COST[1]
CENTRALIZED LIME SOFTENING WATER TREATMENT PLANT	$ 74,784,000.00
TOTAL ESTIMATED COST FOR GROUNDWATER TREATMENT WITH LIME SOFTENING	**$ 74,784,000.00**

O&M Costs

3.5 MGD SINGLE STAGE (CLARICONE) LIME SOFTENING WATER TREATMENT PLANT

ITEM NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT	
1	WELL OM&R	5	$ 104,249.00	$ 521,245.00	/year
2	SINGLE STAGE LSWTP OM&R	1	$ 1,571,027.00	$ 1,571,027.00	/year
TOTAL ESTIMATED OM&R COST FOR 3.5 MGD SINGLE STAGE (CLARICONE) LIME SOFTENING WATER TREATMENT PLANT				**$ 2,092,272.00**	**/year**



Regeneration Waste Treatment – WesTech SPIRALATER

Capital Costs

OPTION 3: REGENERATION WASTE TREATMENT - WESTECH SPIRALATER		TOTAL ESTIMATED CAPITAL COST[1]
	WELL NO. 7 WATER TREATMENT PLANT	$ 3,042,000.00
	WELL NO. 8 WATER TREATMENT PLANT	$ 3,113,000.00
	WELL NO. 9 WATER TREATMENT PLANT	$ 3,042,000.00
	WELL NO. 10 WATER TREATMENT PLANT	$ 2,762,000.00
	WELL NO. 12 WATER TREATMENT PLANT	$ 3,042,000.00
	TOTAL ESTIMATED COST FOR REGENERATION WASTE TREATMENT WITH SPIRALATER	**$ 15,001,000.00**

O&M Costs

REGENERATION WASTE TREATMENT - WESTECH SPIRALATER						
ITEM NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT		
1	WELL OM&R	5	$ 104,249.00	$ 521,245.00	/year	
2	CATION EXCHANGE AND SPIRALATER TREATMENT OM&R	5	$ 196,677.00	$ 983,385.00	/year	
	TOTAL ESTIMATED OM&R COST FOR REGENERATION WASTE TREATMENT WITH WESTECH SPIRALATER			**$ 1,504,630.00**	**/year**	

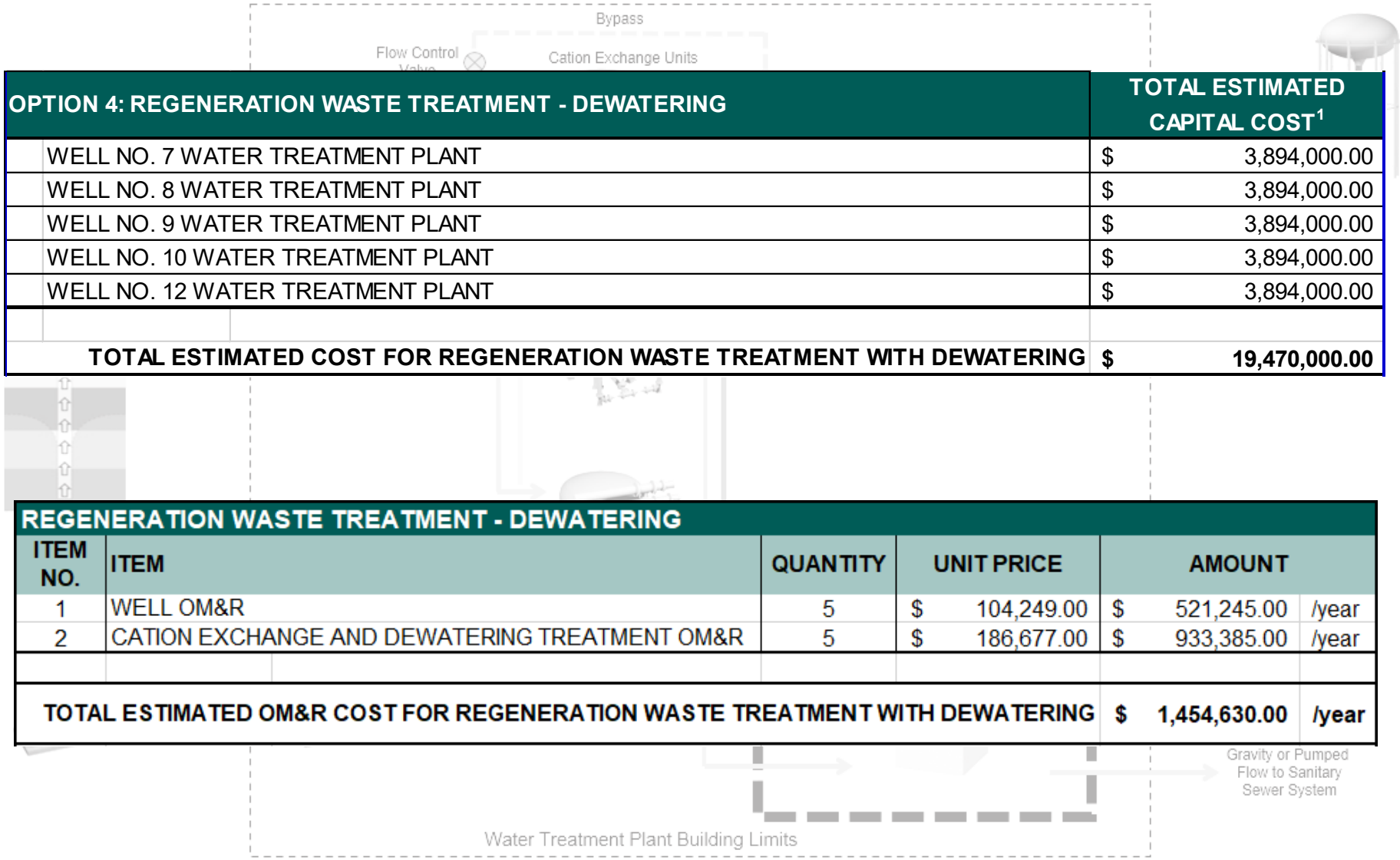
Regeneration Waste Treatment – Dewatering

Capital Costs

OPTION 4: REGENERATION WASTE TREATMENT - DEWATERING		TOTAL ESTIMATED CAPITAL COST[1]
	WELL NO. 7 WATER TREATMENT PLANT	$ 3,894,000.00
	WELL NO. 8 WATER TREATMENT PLANT	$ 3,894,000.00
	WELL NO. 9 WATER TREATMENT PLANT	$ 3,894,000.00
	WELL NO. 10 WATER TREATMENT PLANT	$ 3,894,000.00
	WELL NO. 12 WATER TREATMENT PLANT	$ 3,894,000.00
	TOTAL ESTIMATED COST FOR REGENERATION WASTE TREATMENT WITH DEWATERING	**$ 19,470,000.00**

O&M Costs

REGENERATION WASTE TREATMENT - DEWATERING					
ITEM NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT	
1	WELL OM&R	5	$ 104,249.00	$ 521,245.00	/year
2	CATION EXCHANGE AND DEWATERING TREATMENT OM&R	5	$ 186,677.00	$ 933,385.00	/year
TOTAL ESTIMATED OM&R COST FOR REGENERATION WASTE TREATMENT WITH DEWATERING				**$ 1,454,630.00**	**/year**



Lake Michigan Supply - CLCJAWA

Capital Costs

CLC-JAWA LAKE MICHIGAN SUPPLY OPTION	TOTAL ESTIMATED AMOUNT
BOOSTER STATION	$ 2,500,000
ALTERNATIVE 1 ROUTE	$ 19,917,000
LS DISTRIBUTION IMPROVEMENTS FOR NEW WATER SYUPPLY	$ 8,400,000
NEW STORAGE TANKS	$ 750,000
DEMOLITION OF EXISTING WTP'S AND ELECTRICAL IMPROVEMENTS	$ 2,000,000
LZ METERING AND BOOSTER STATION	$ 2,000,000
Subtotal Transmission Cost	**$ 35,567,000**
Contingency (30%)	$ 10,670,100
Total Construction Cost for Transmission	**$ 46,237,100**
Corrosion Control Study	$ 750,000
Engineering and Legal (20%)	$ 9,247,420
TOTAL TRANSMISSION COSTS	**$ 56,235,000**
SUPPLIER CONNECTION COSTS	**$ 20,000,000**
TOTAL CONNECTION COST (TRANSMISSION + CONNECTION COSTS)	**$ 76,235,000**

O&M Costs

LAKE MICHIGAN RECEIVING AND DISTRIBUTION						
ITEM NO.	ITEM	QUANTITY	UNIT PRICE		AMOUNT	
1	LAKE MICHIGAN RECEIVING AND DISTRIBUTION OM&R	1	$ 114,587.00	$	114,587.00	/year
2	EMERGENCY BACKUP WELL OM&R	3	$ 36,983.00	$	110,949.00	/year
TOTAL ESTIMATED OM&R COST FOR LAKE MICHIGAN RECEIVING AND DISTRIBUTION				**$**	**225,536.00**	**/year**

Lake Michigan Supply – NWC

Capital Costs

NORTHWEST WATER COMMISSION LAKE MICHIGAN SUPPLY OPTION	TOTAL ESTIMATED AMOUNT
BOOSTER STATION	$ 2,500,000
ALTERNATIVE 1 ROUTE	$ 19,995,000
LS DISTRIBUTION IMPROVEMENTS FOR NEW WATER SYUPPLY	$ 8,400,000
NEW STORAGE TANKS	$ 1,245,000
DEMOLITION OF EXISTING WTP'S AND ELECTRICAL IMPROVEMENTS	$ 2,000,000
LZ METERING AND BOOSTER STATION	$ 2,000,000
Subtotal Transmission Cost	**$ 36,140,000**
Contingency (30%)	$ 10,842,000
Total Construction Cost for Transmission	**$ 46,982,000**
Corrosion Control Study	$ 750,000
Engineering and Legal (20%)	$ 9,396,400
TOTAL TRANSMISSION COSTS	**$ 57,129,000**
SUPPLIER CONNECTION COSTS	**$ - **
TOTAL CONNECTION COST (TRANSMISSION + CONNECTION COSTS)	**$ 57,129,000**

O&M Costs

LAKE MICHIGAN RECEIVING AND DISTRIBUTION					
ITEM NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT	
1	LAKE MICHIGAN RECEIVING AND DISTRIBUTION OM&R	1	$ 114,587.00	$ 114,587.00	/year
2	EMERGENCY BACKUP WELL OM&R	3	$ 36,983.00	$ 110,949.00	/year
TOTAL ESTIMATED OM&R COST FOR LAKE MICHIGAN RECEIVING AND DISTRIBUTION				**$ 225,536.00**	**/year**

Lake Michigan Supply – NSMJAWA

Capital Costs

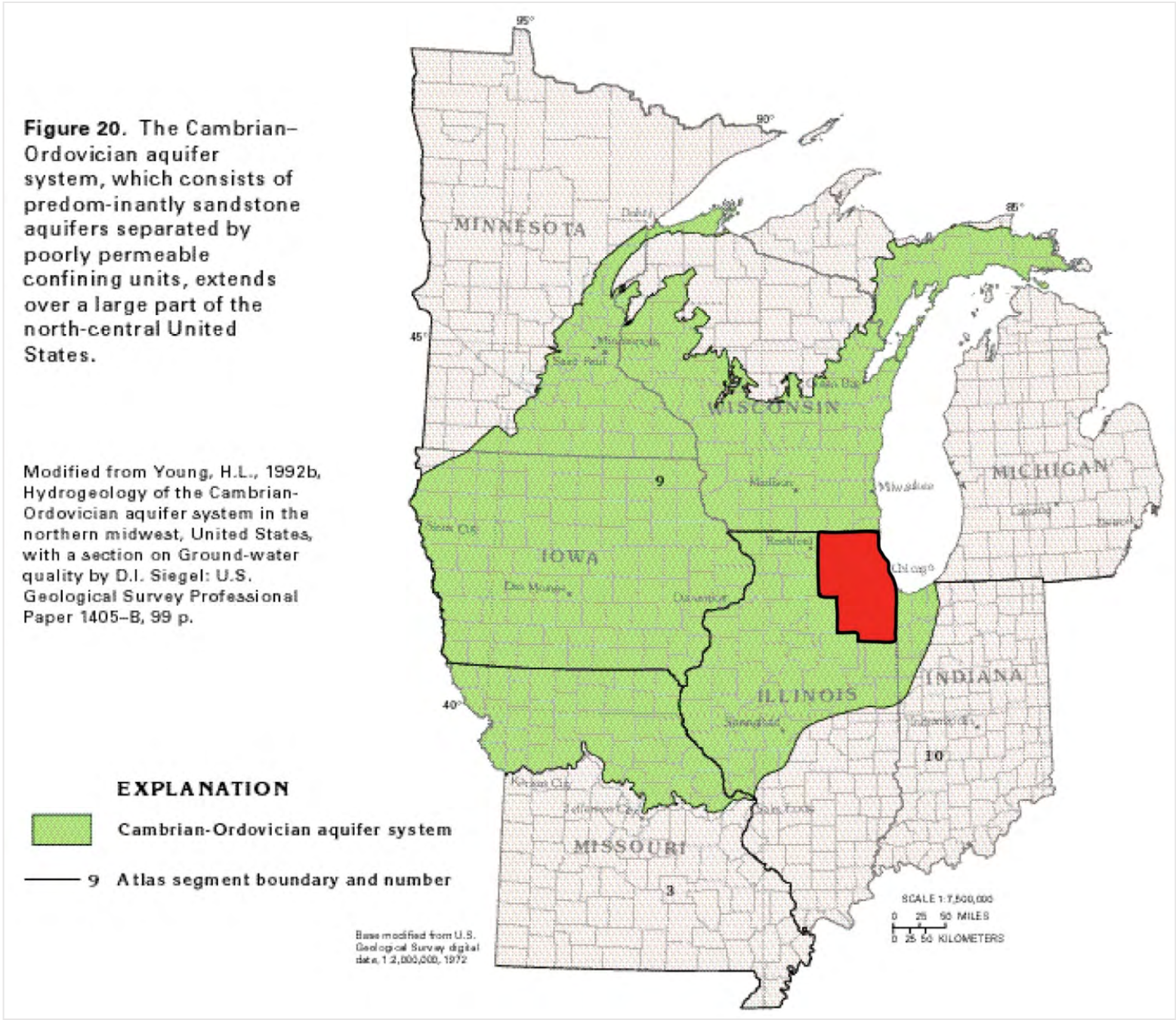
NSM-JAWA LAKE MICHIGAN SUPPLY OPTION	TOTAL ESTIMATED AMOUNT
BOOSTER STATION	$ 2,500,000
ALTERNATIVE 1 ROUTE	$ 31,267,000
LS DISTRIBUTION IMPROVEMENTS FOR NEW WATER SYUPPLY	$ 8,400,000
NEW STORAGE TANKS	$ 1,425,000
DEMOLITION OF EXISTING WTP'S AND ELECTRICAL IMPROVEMENTS	$ 2,000,000
LZ METERING AND BOOSTER STATION	$ 2,000,000
Subtotal Transmission Cost	**$ 47,592,000**
Contingency (30%)	$ 14,277,600
Total Construction Cost for Transmission	**$ 61,869,600**
Corrosion Control Study	$ 750,000
Engineering and Legal (20%)	$ 12,373,920
TOTAL TRANSMISSION COSTS	**$ 74,994,000**
SUPPLIER CONNECTION COSTS	**$ - **
TOTAL CONNECTION COST (TRANSMISSION + CONNECTION COSTS)	**$ 74,994,000**

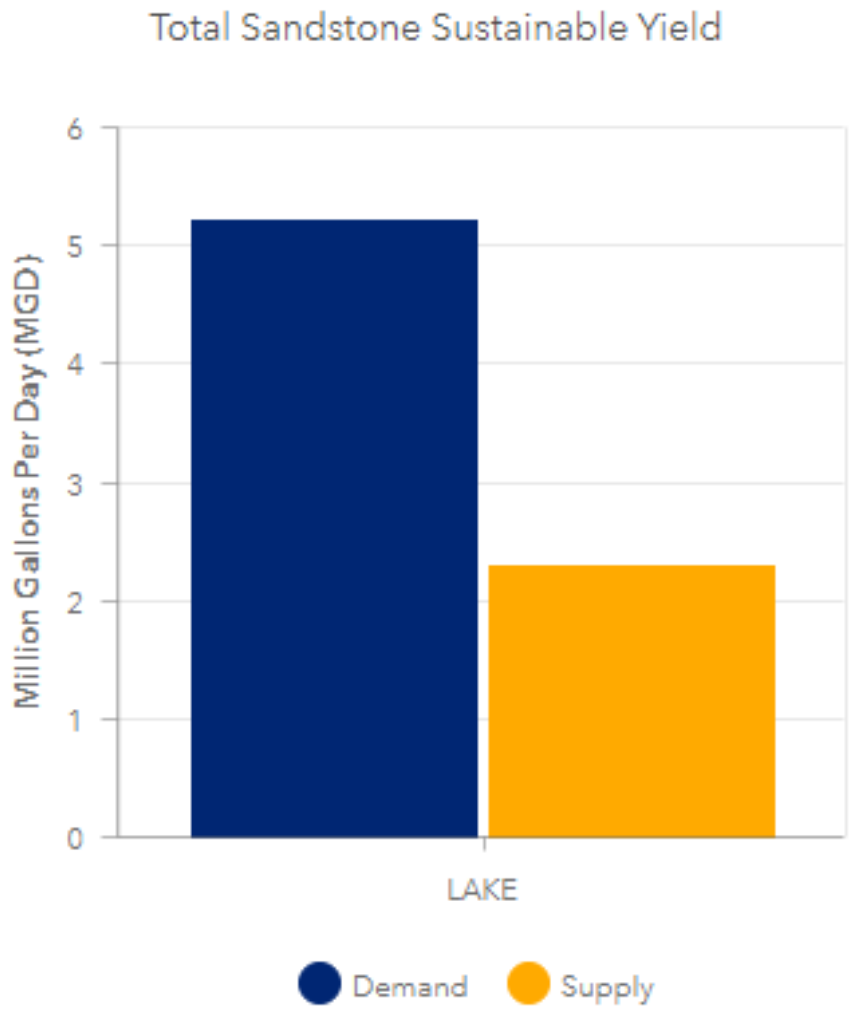
O&M Costs

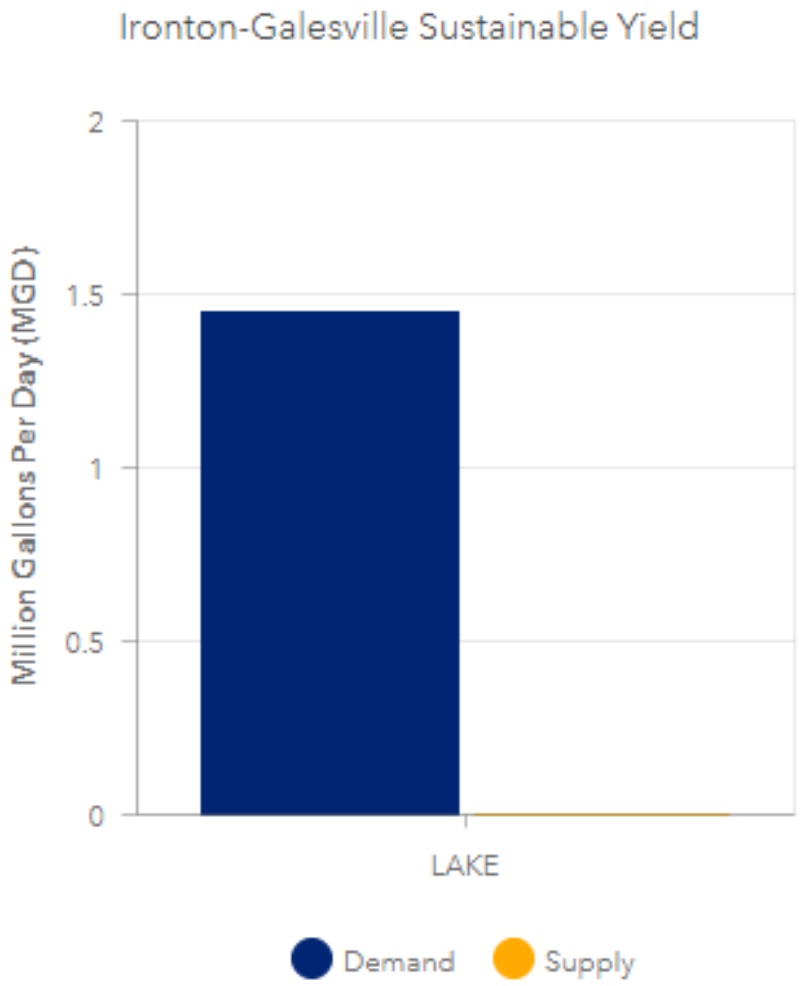
LAKE MICHIGAN RECEIVING AND DISTRIBUTION						
ITEM NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT		
1	LAKE MICHIGAN RECEIVING AND DISTRIBUTION OM&R	1	$ 114,587.00	$ 114,587.00	/year	
2	EMERGENCY BACKUP WELL OM&R	3	$ 36,983.00	$ 110,949.00	/year	
TOTAL ESTIMATED OM&R COST FOR LAKE MICHIGAN RECEIVING AND DISTRIBUTION				**$ 225,536.00**	**/year**	

Regional Groundwater Aquifer

Cambrian-Ordovician Aquifer







https://prairie-research.maps.arcgis.com/apps/opsdashboard/index.html#/9825690df3b14da39f03bdfeb69cd33e

Rate Impacts

1. Assumes Total Project Debt Service Funded by Rates
2. Function of Village Water Demand (MG per Year)
3. Evaluation
    a. Evaluated Change in Water Operations Cost (OM&R).
    b. Sewer rate not changed.
    c. Total Capital Cost assumed to be Amortized over 20 years utilizing IEPA (State Revolving Loans – SRF).
    d. Connection Costs assumed to be amortized over 20 years with no interest.
    e. Debt service rate not changed.
    f. Capital rate not changed.
    g. LM Options – Assumes 2021 Water Rates from Suppliers – Does Not Include Future Rate Changes.