



Great Lakes Application

City of Waukesha Common Council Meeting, July 27, 2010

CH2M HILL

We are an industry leader in providing practical, sustainable solutions to complex water challenges



- More than 23,500 employees
- US\$6.3 billion in revenue
- Local Wisconsin office of 175 staff
- Operations on all continents
- 100 percent owned by our employees

ENR Ranks
CH2M HILL **#1**
in Water Supply and Treatment

CH2M HILL is No. 1 in:

- Water Supply/Treatment
- Wastewater Treatment
- Environmental Engineering
- Pipelines
- Program Management



Source: *Engineering News-Record*, July 2009

Global Reputation

FORTUNE Magazine

- 100 “Best Companies to Work For”
2009, 2008, 2006, 2003
- “America’s Most Admired Companies”
named six times



Ethisphere Institute

- Received “World’s Most Ethical Companies”
award for the advancement of best practices
in business ethics and corporate social
responsibility for 2009 and 2010.

CH2M HILL Business Policies in Practice

- Every year every employee affirms ethical conduct policy
 - Objective and truthful
 - Professional competence in the subject matter
 - Avoid conflicts of interest

Great Lakes Application

Giving Waukesha the option for a
Great Lakes water supply

All Viable Water Options were Evaluated Objectively, Comprehensively and Openly

- 14 individual water sources and many combinations of water supplies
- *All options include continued and expanded water conservation*
- *All options were evaluated with the same applicable criteria*
- *All option costs were estimated on the same basis*

Several Independent Technical Professionals Support the City with Unbiased Analyses

Scientists, engineers and planners:

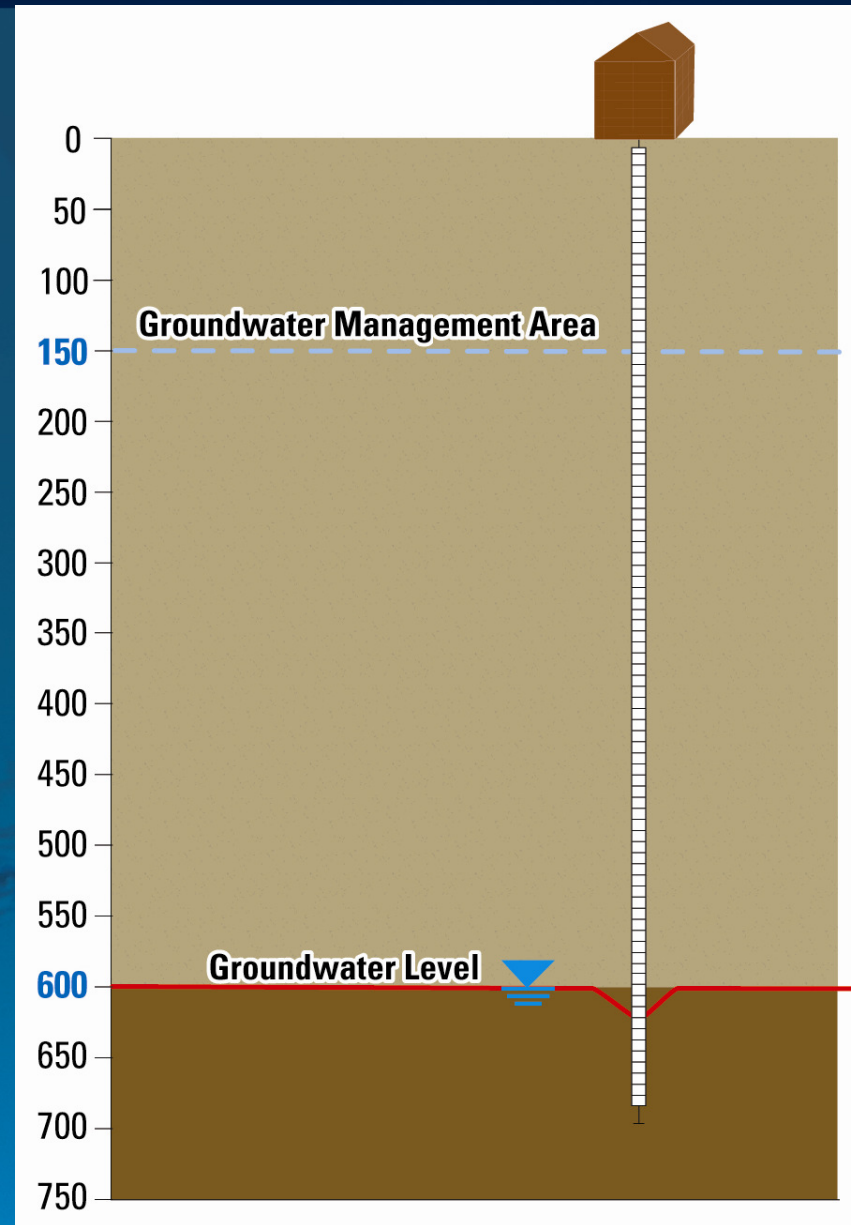
- Future water supply planning – CH2M HILL/Ruekert & Meilke
- Water infrastructure master planning – AECOM
- Groundwater supply exploration – Ruekert & Meilke
- Shallow aquifer modeling – RJN Environmental Services
- Water conservation planning – Geosyntec Consultants
- Return flow habitat assessment – SEH

Water supply planning requires a long-term view

- 50-year planning period or more
 - Avoids wasted infrastructure investment on short-term solutions
 - Water service area is only expanded at the request of citizens
- Obtain the highest quality, sustainable water supply
 - Only pursue lower quality, less sustainable supplies if you can't get enough from the best supply.

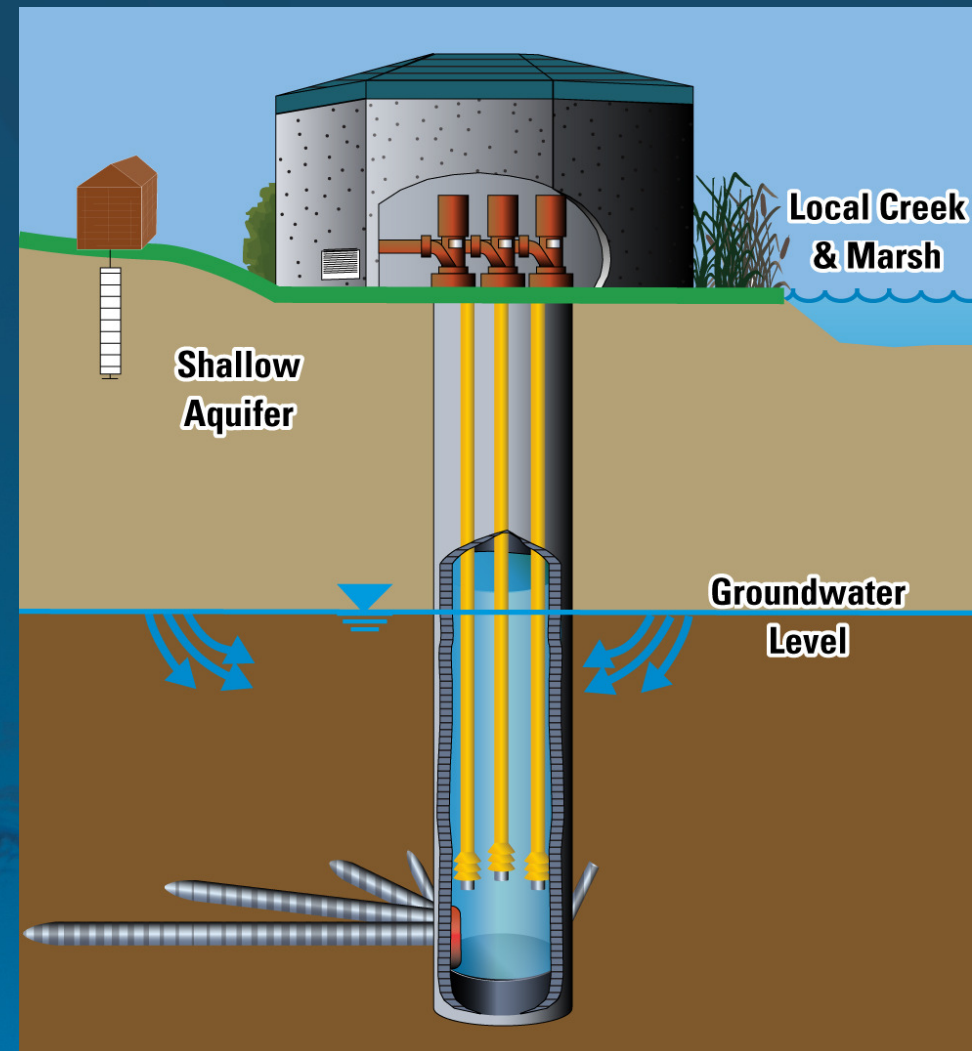
Deep Aquifer

- Continued drawdown is not sustainable and regulations may stop it
- Water quality will get worse



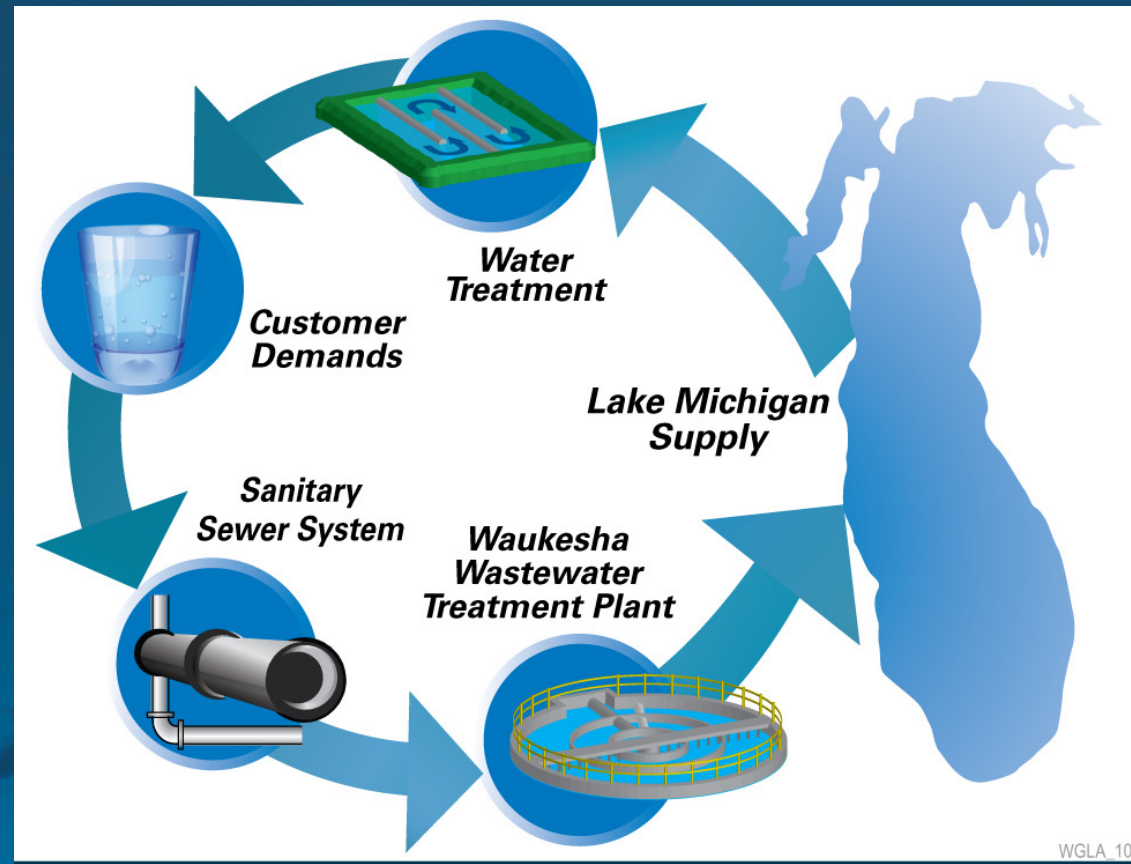
Shallow Aquifer and Fox River Alluvium

- Drawdown of shallow aquifer adversely impacts wetlands, streams, and other private wells
- Well development may be challenged by legal actions
- Higher risk of contamination — public health protection



Great Lakes Water

- High quality and sustainable - fresh water is recycled, drought proof
- Environmental resources benefit from ceasing groundwater extraction



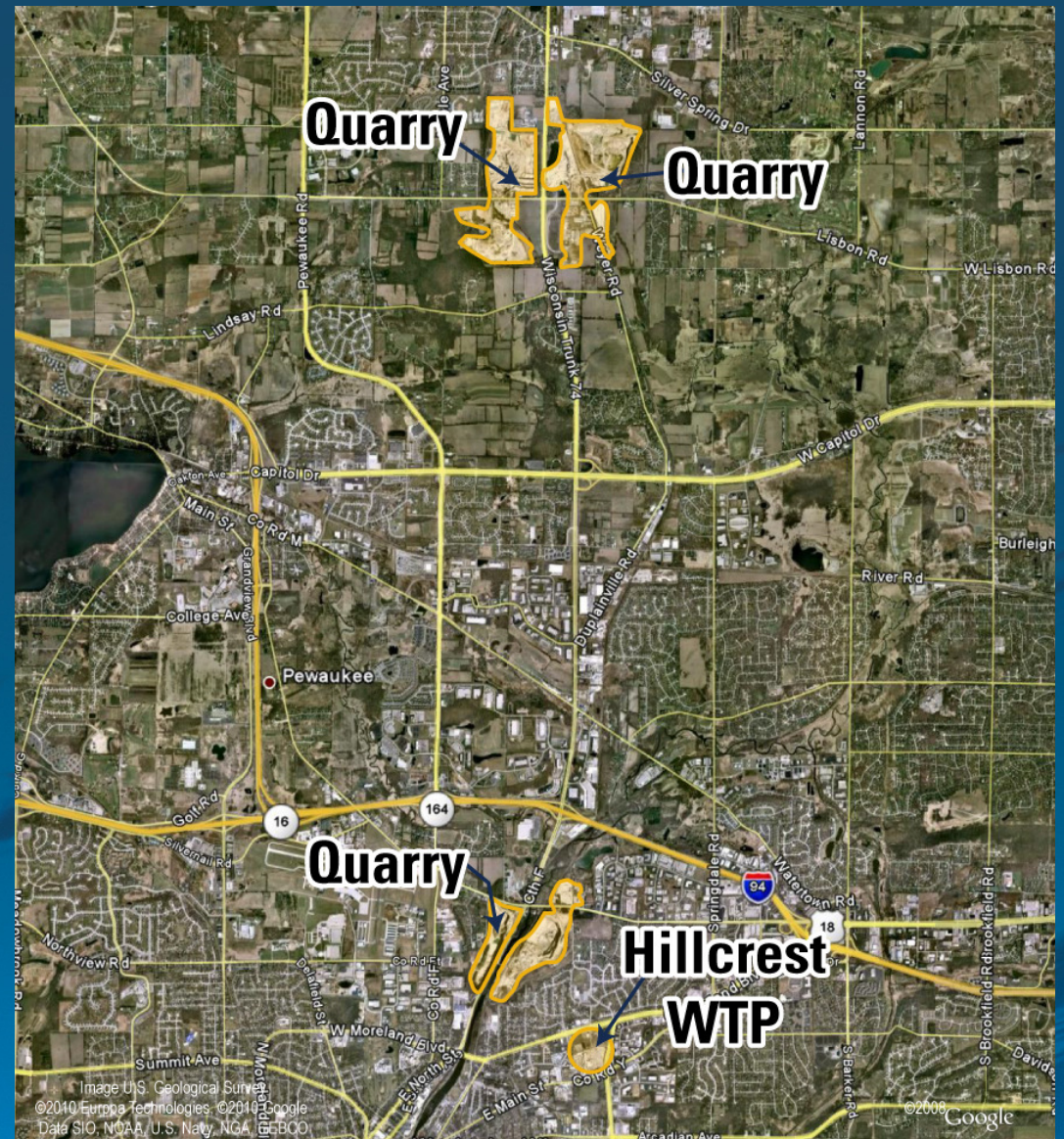
WGLA 101

Multiple Source Water Supply Alternative

1. Continued use of deep aquifer
2. Expanded use of shallow and Fox River aquifer
- *AND* –
3. *Capture water from quarries*
4. *Develop wells in western unconfined aquifer*
5. *Implement even more aggressive water conservation*
6. *Develop rainwater infiltration sites*

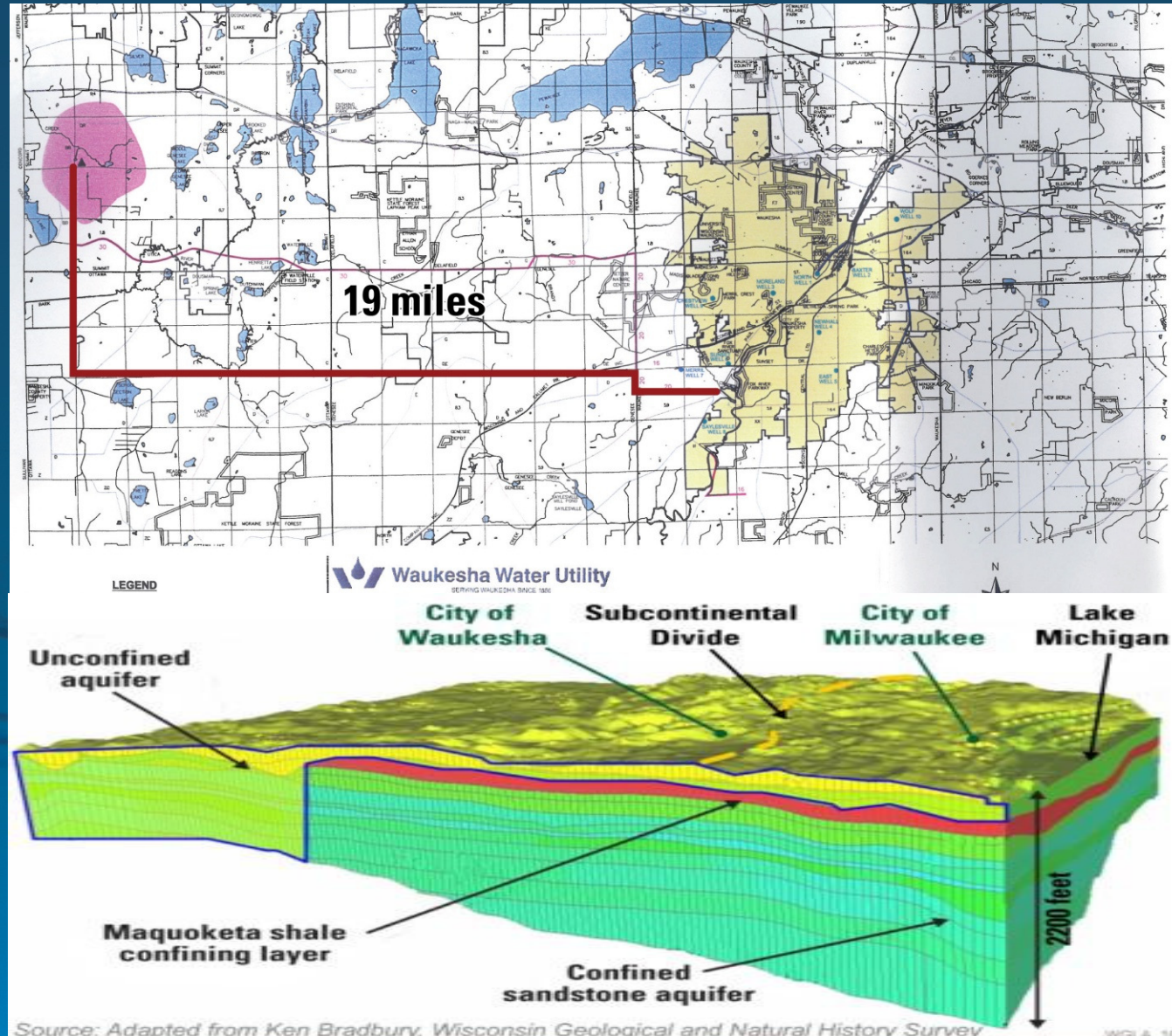
Quarry Water

- Active, privately-owned quarries in the Town of Pewaukee, Town of Lisbon, and Village of Lannon
- Risks: water susceptible to contamination and drought



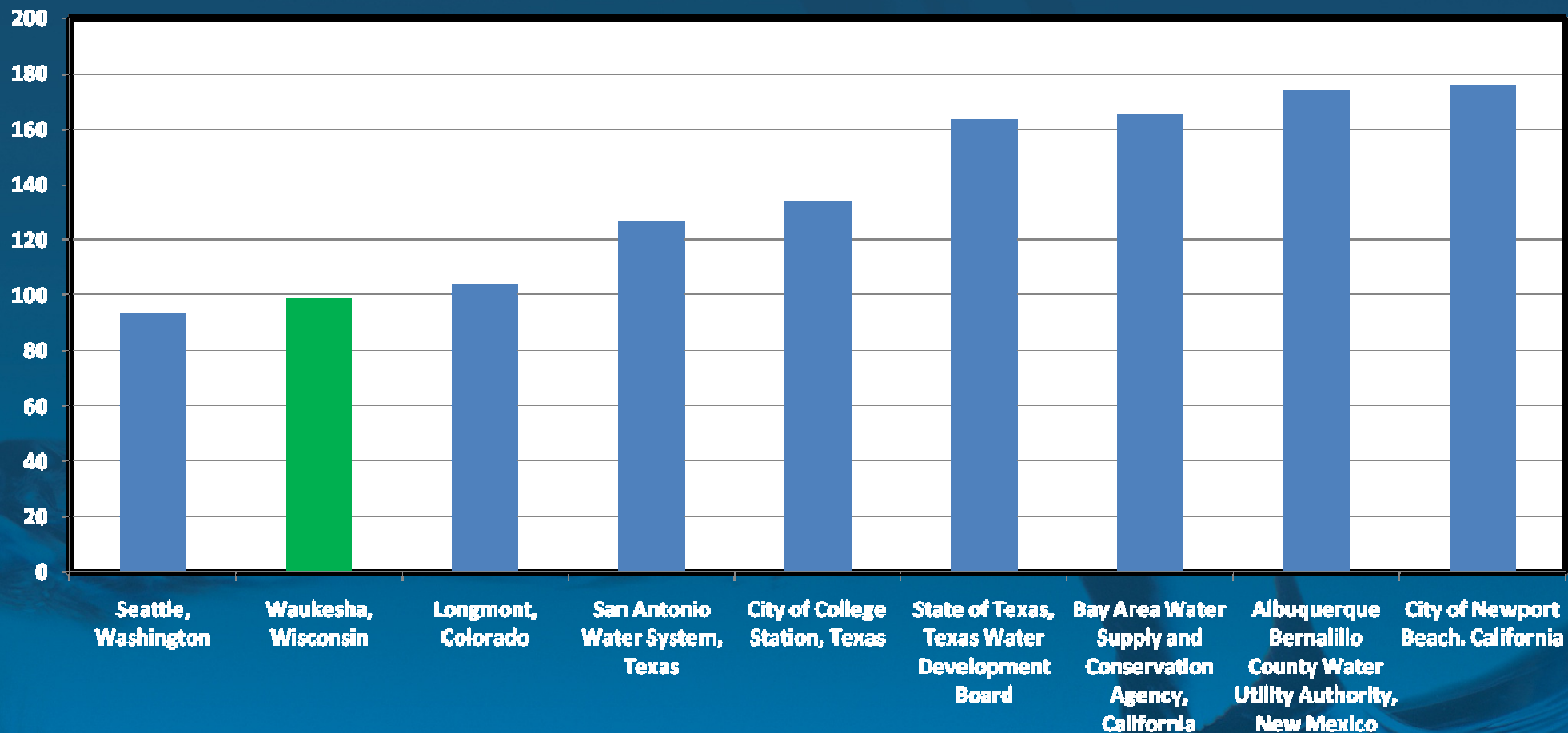
Western Unconfined Deep Aquifer

- Develop wells in unconfined aquifer
- Transfer water 19 miles
- Risks: legal challenges related to transfer of water, environmental impacts



Water Conservation: Waukesha Uses Water Efficiently and Commits to More

**Average Consumption
Gallons per Person per Day**

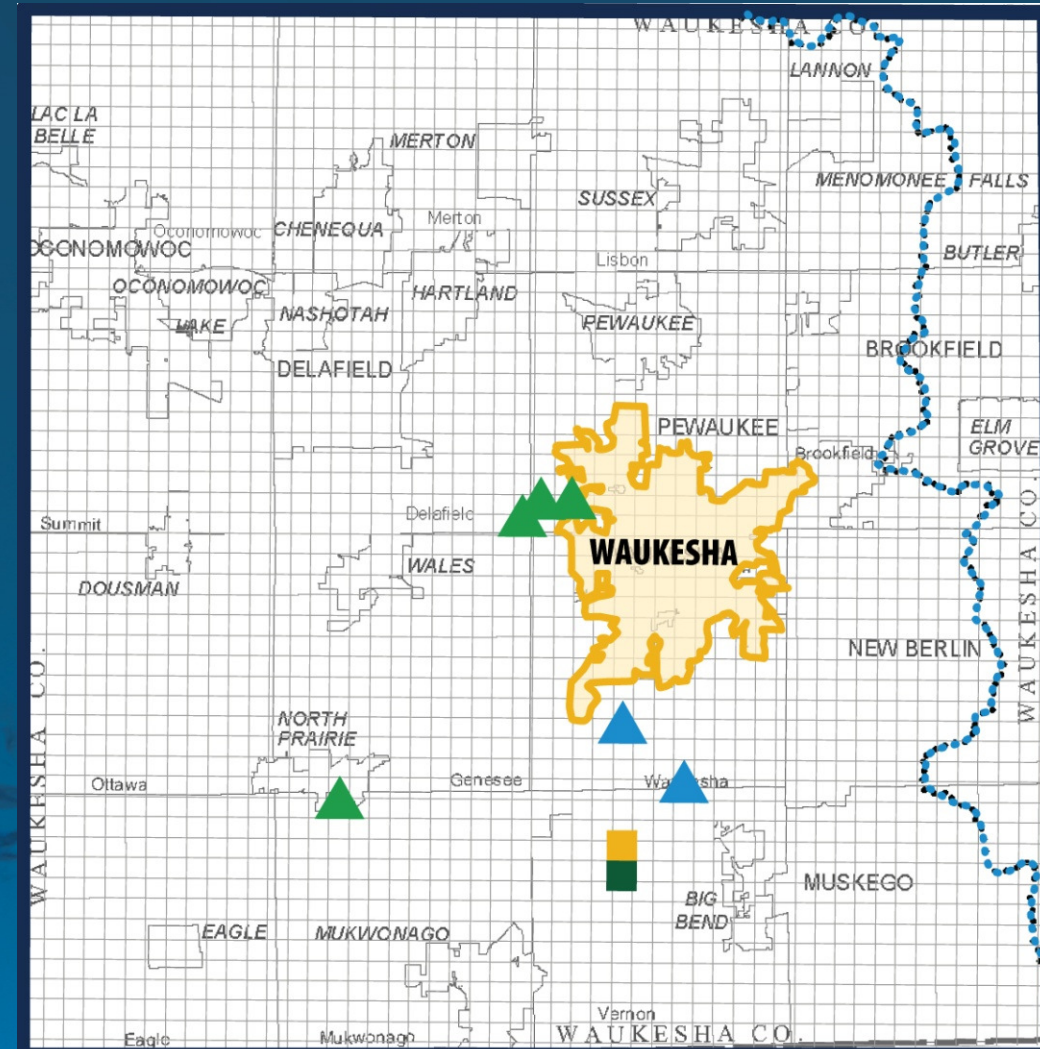


Aggressive Water Conservation has Key Role in Water Supply Alternatives

- Existing water conservation is a major factor in City's current reduced water use
- All water supply alternatives include continued water conservation an additional 1 mgd water savings
 - Public Education
 - Outdoor sprinkling restrictions
 - Toilet and clothes water replacement rebates
 - Leak detection surveys
- Multiple Source alternative assumes an additional 2 mgd water savings from conservation is possible

Rainwater Infiltration

- 265 acres to recharge shallow aquifer
- Very limited amount of water across the County (SEWRPC Regional Water Supply Study)
- Risks: challenging land acquisitions; limited recharge across county; not effective during drought



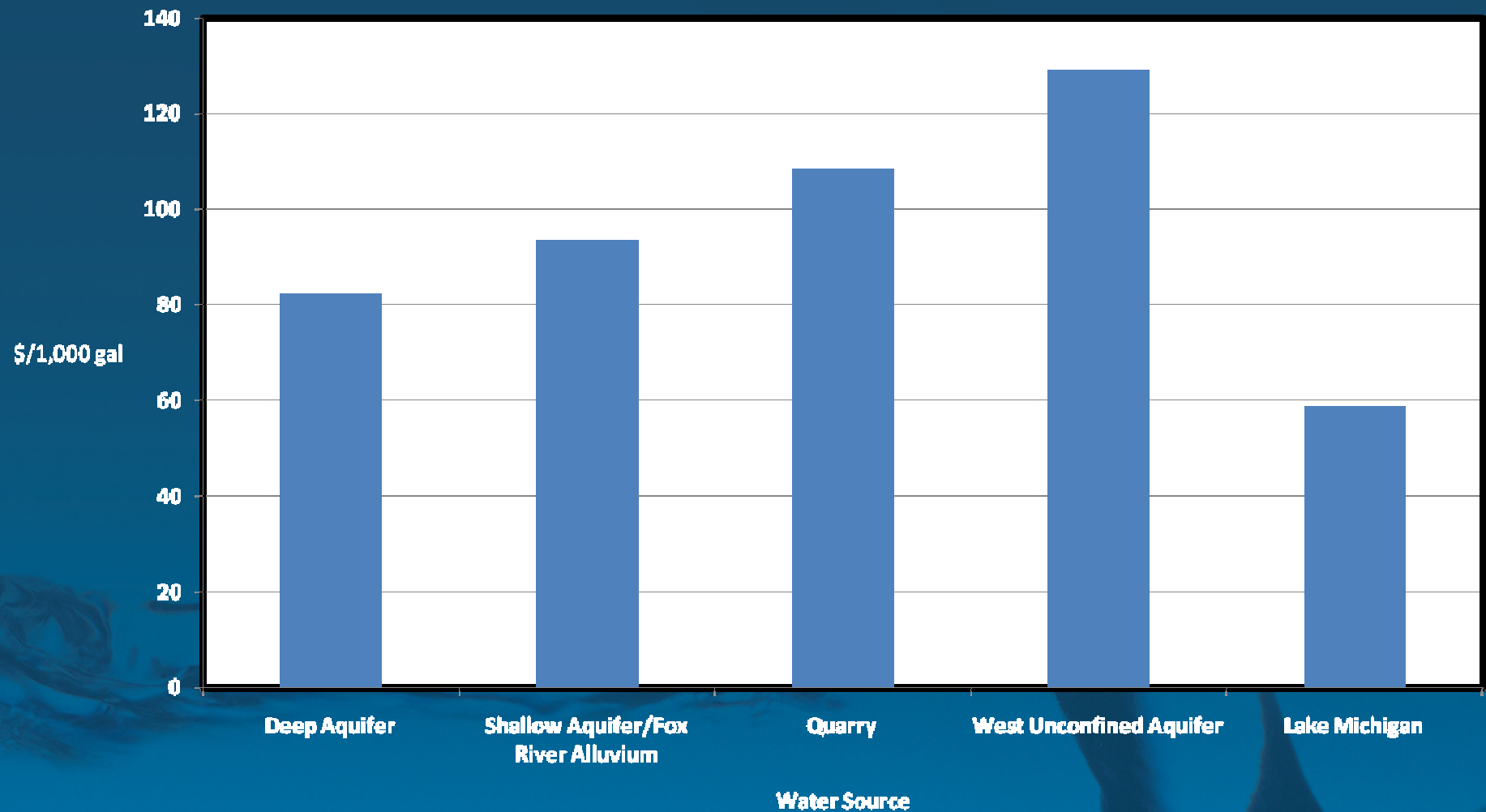
Water Supply Alternatives Cost Summary

TABLE 1
Water Supply Alternative Cost Estimates

Water Supply Alternative	Capital Cost ^a (\$ million)	Annual Operation/Maintenance Cost (\$ million)	20 yr. Present Worth Cost (\$ million, 6%)	50 yr. Present Worth Cost (\$ million, 6%)
Deep and shallow aquifers	189	7.2	272	302
Shallow aquifer and Fox River alluvium	184	7.4	269	301
Lake Michigan and Shallow Aquifer	238	7.5	324	356
Lake Michigan with return flow to Underwood creek	164	6.2	235	262
Deep, shallow aquifers, Fox River, quarries	286	7.6	373	406

^aIncludes direct construction cost, contractor administrative costs (insurance, bonds, supervision etc), 25% contingency, and costs for permitting, legal, engineering, administrative.

Water Source Cost Summary



Comparison of Water Supply Alternatives by Criteria

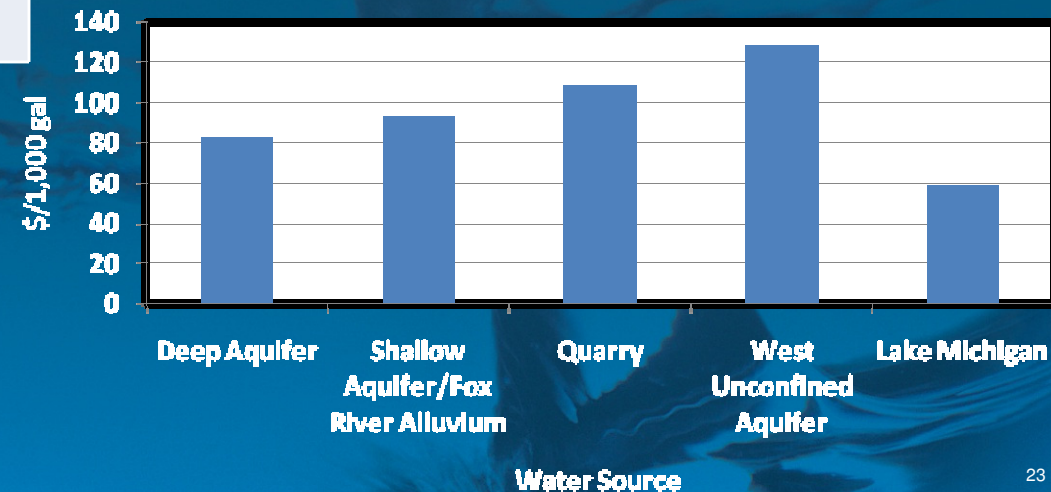
Comparison of Water Supply Alternatives				
Water Supply Alternative	Environmental Impact	Long-Term Sustainability	Public Health	Implementability
Deep and shallow aquifers	●	●	◉	●
Shallow aquifer and Fox River alluvium	●	●	◉	●
Lake Michigan, deep and shallow aquifers	●	◉	⊙	●
Lake Michigan	○	○	⊙	◉
Deep, shallow aquifers, Fox River, quarry	●	●	●	●
<div> <div>○ No negative impact</div> <div>◉ Moderate negative impact</div> <div>⊙ Minor negative impact</div> <div>● Significant negative impact</div> </div>				

The option for a Great Lakes water supply has many benefits for the citizens of Waukesha

	Great Lakes	Deep Aquifer	Shallow Aquifer	Quarry	Western Aquifer	Fox River Aquifer
Sustainable/ Reliable	✓					
Highest quality for public health	✓					
Least adverse environmental impacts	✓					
Least cost	✓					

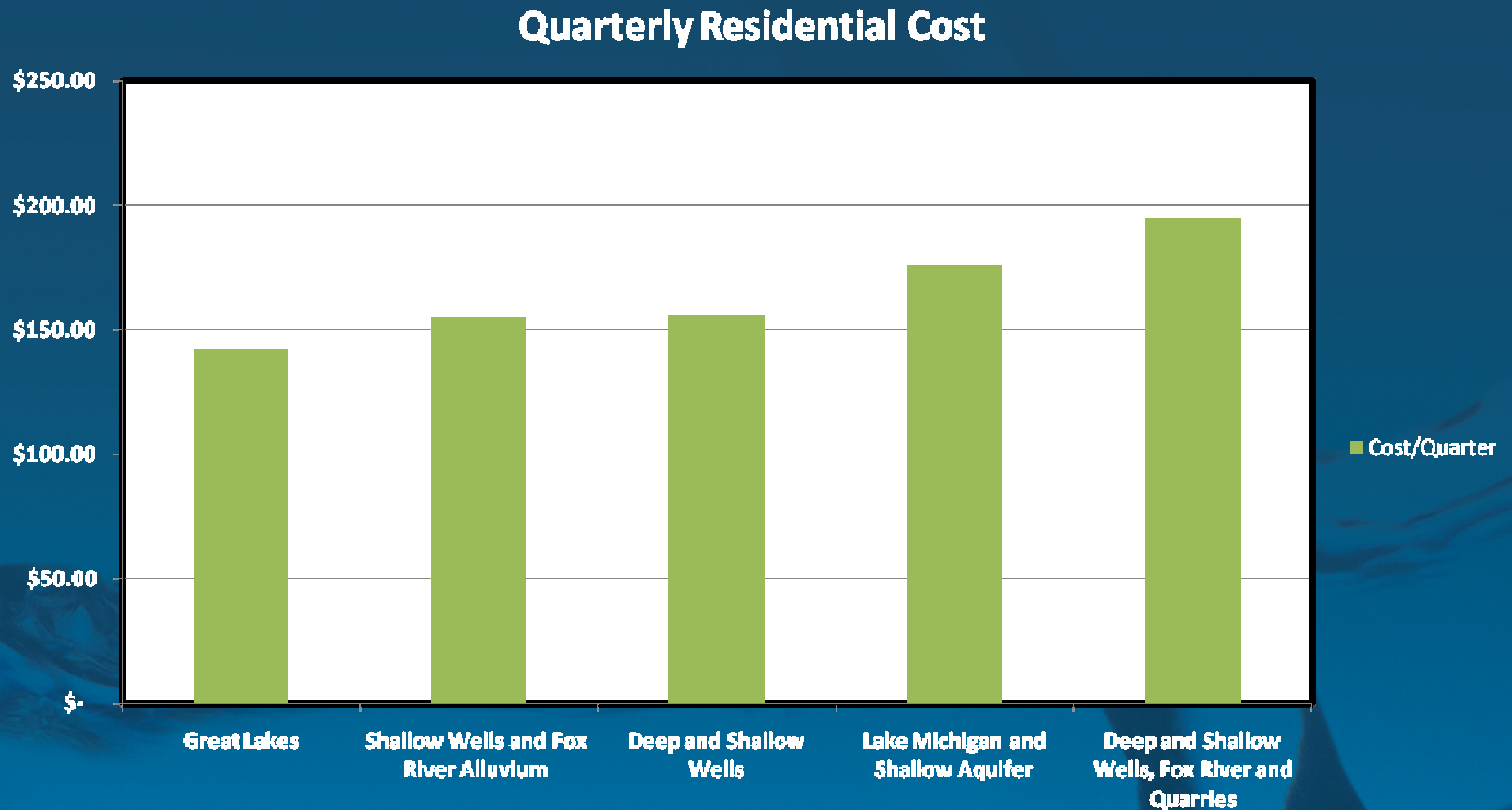
A Great Lakes water supply has the most benefits for the lowest cost

	Great Lakes	Deep Aquifer	Shallow Aquifer	Quarry	Western Aquifer	Fox River Aquifer
Sustainable/Reliable	✓					
Highest quality for public health	✓					
Least adverse environmental impacts	✓					
Least cost	✓					



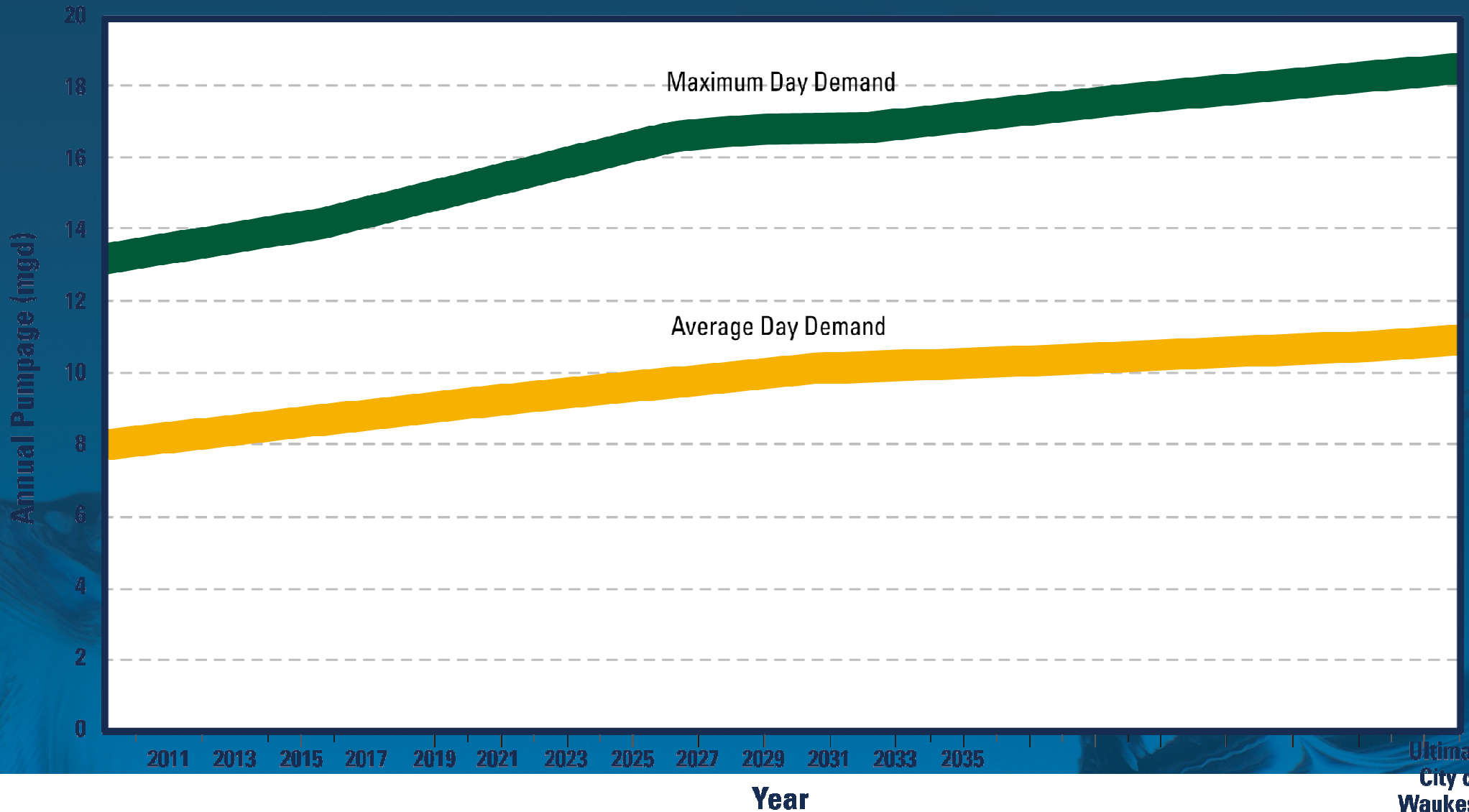
Questions

Water Supply Alternatives Rates



Our Need for Water

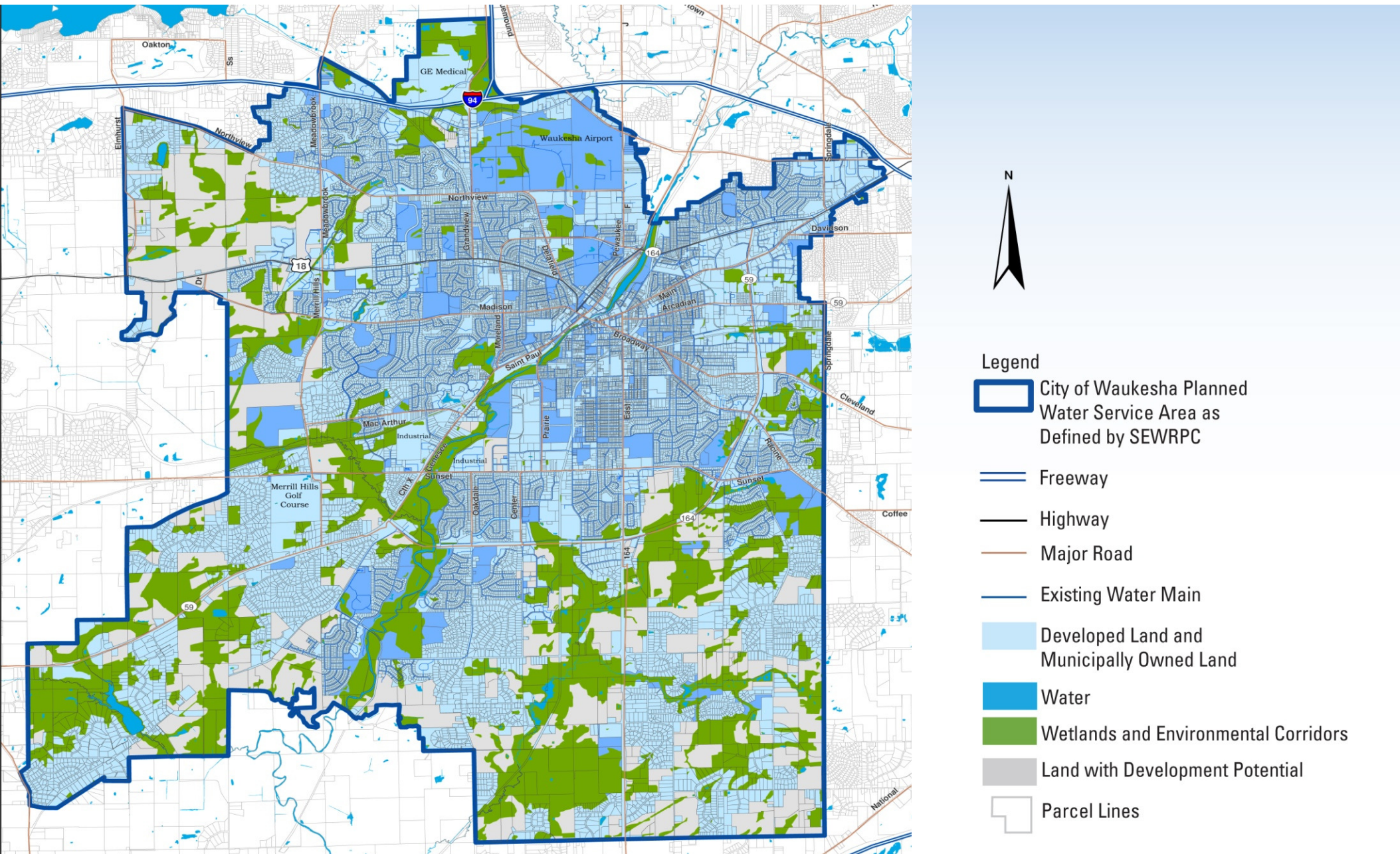
Future Water Demand Projections



Source: AECOM

Ultimate
City of
Waukesha
Buildout

City of Waukesha Planned Water Service Area and Lands with Development Potential December 2009



Laws Define Reasonable Water Supply Alternative to a Great Lakes supply

- As environmentally sustainable as a Great Lakes supply
- As protective of public health as a Great Lakes supply
- No greater adverse environmental impacts as a Great Lakes supply
- Similar in cost to a Great Lakes supply
(*Wis. Stat. § 281.346(1)(ps)*)

None of the other water supply alternatives are reasonable