



ADVISORY COUNCIL MEETING #1

July 19, 2022



WELCOME!



INTRODUCTIONS

RULES FOR ENGAGEMENT

- The deliberation process will be collaborative
- Everyone's perspective is valued and respected
- Listen to understand, not to debate
- Be concise
- Be hard on the issues – soft on the people
- Avoid right-wrong paradigms

RULES FOR ENGAGEMENT

- Everyone should have an equal opportunity to participate
- Respect start and finish times
- Provide your full attention
- Full participation is critical
- Ask questions – don't wait

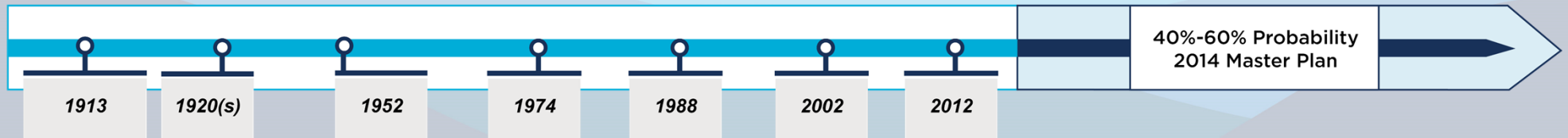
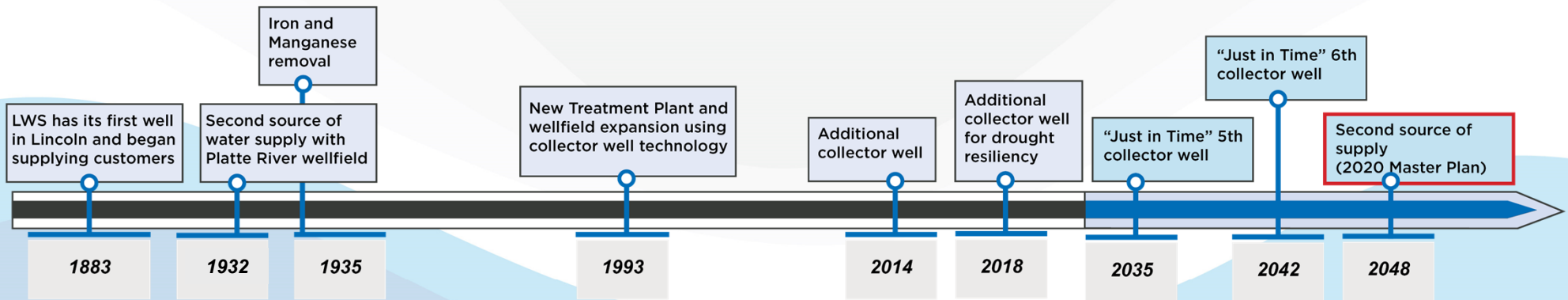
GOALS FOR THE MEETING

- Knowledge Leveling
- Alternative Evaluation Process
- Selection and Prioritization of Alternative Criteria
- Understanding the Whys

The background features a series of overlapping, wavy, horizontal bands. The top section consists of three bands in shades of grey, ranging from light to dark. Below these, the background transitions into a series of wavy bands in various shades of blue, from a deep navy blue at the bottom to a bright cyan at the top. The text is centered within the white space between the grey and blue sections.

UNDERSTANDING THE NEED

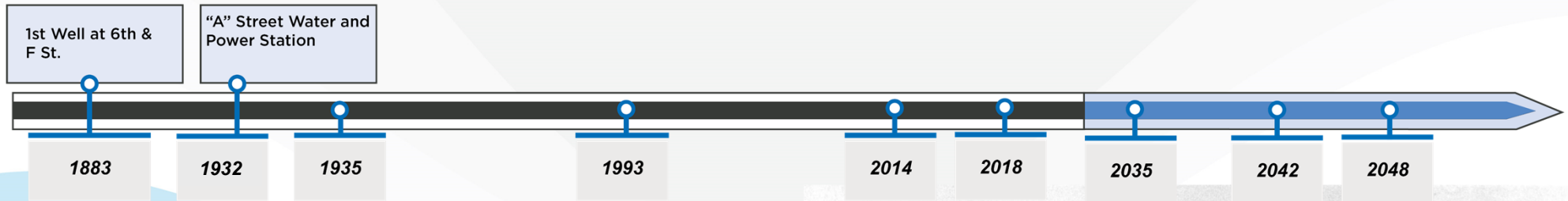
LINCOLN WATER SUPPLY TIMELINE



Water Shortages

40%-60% Probability
2014 Master Plan

LINCOLN WATER SUPPLY TIMELINE



LINCOLN'S WATER SUPPLY PROBLEM

BY G. E. CONDRA

Some claim that Lincoln has no water problem; others view the situation with alarm. However, all agree that a dependable water supply of good quality is one of the most important factors in the life and growth of any municipality and especially so of Lincoln, the Capital and State Institution City of Nebraska.

AVAILABLE WATER.—There are sources from which to produce additional water for the city, as follows:

1. Undeveloped areas in the Dakota formation.
2. St. Peter sandstone.
3. Terraces and flood plains of Salt creek valley.
4. Drift hills.
5. Branches of Salt creek.
6. Big Blue river.
7. Loess plain area.
8. Todd valley.
9. The Platte river and the Platte valley.

By Authority of the State of Nebraska
Lincoln, Nebraska
October 21, 1930



LINCOLN WATER SUPPLY TIMELINE

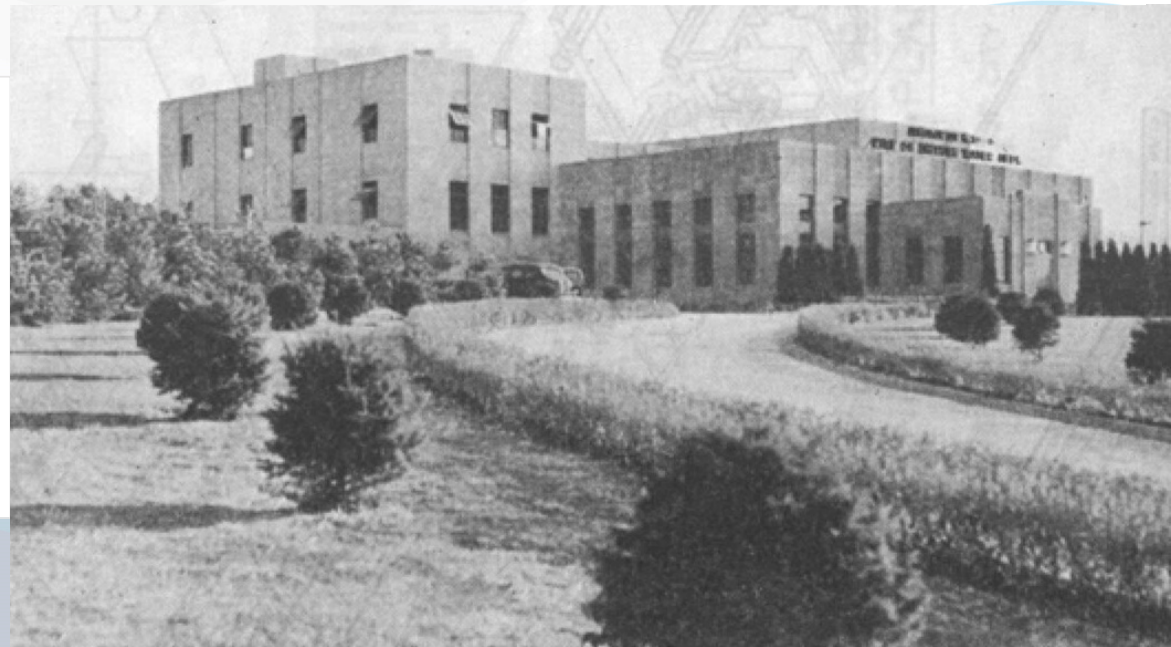
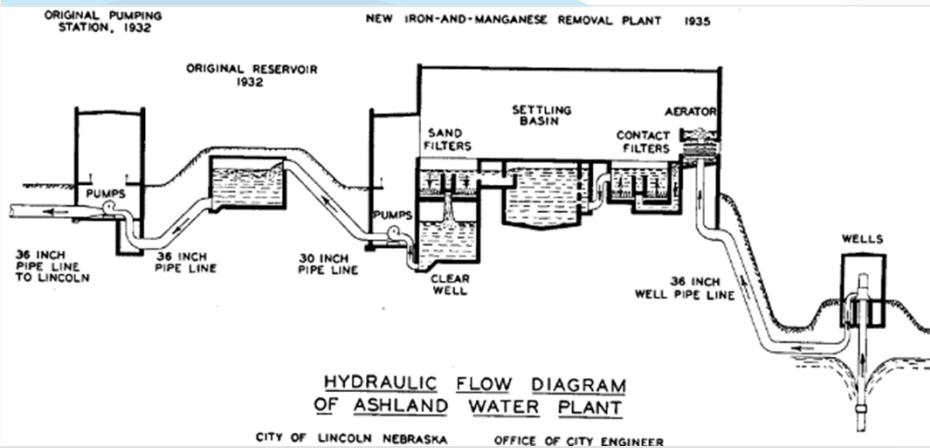
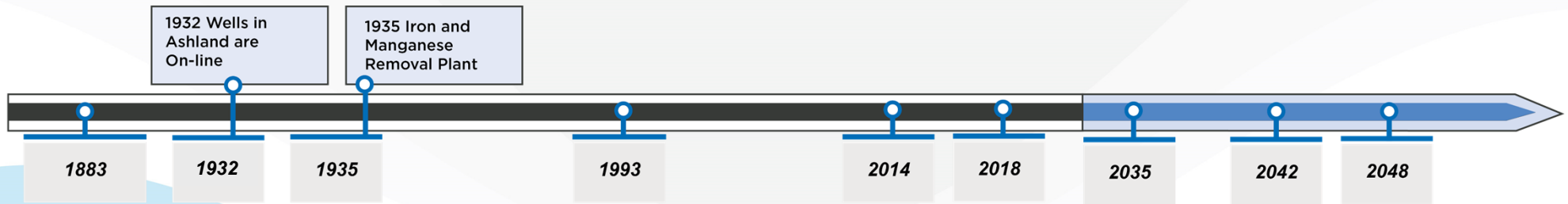
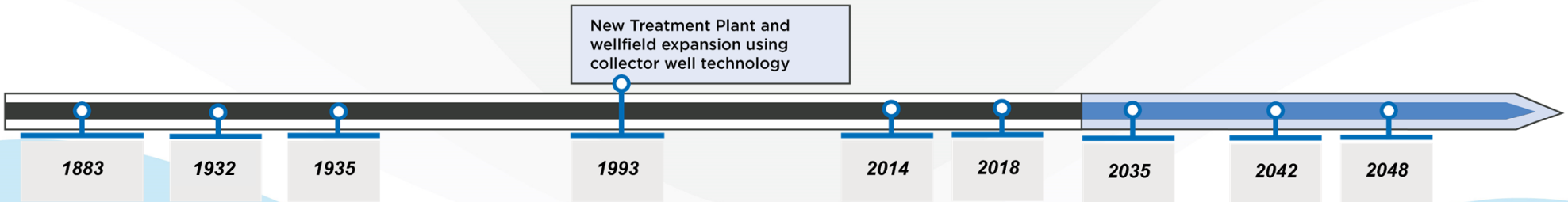
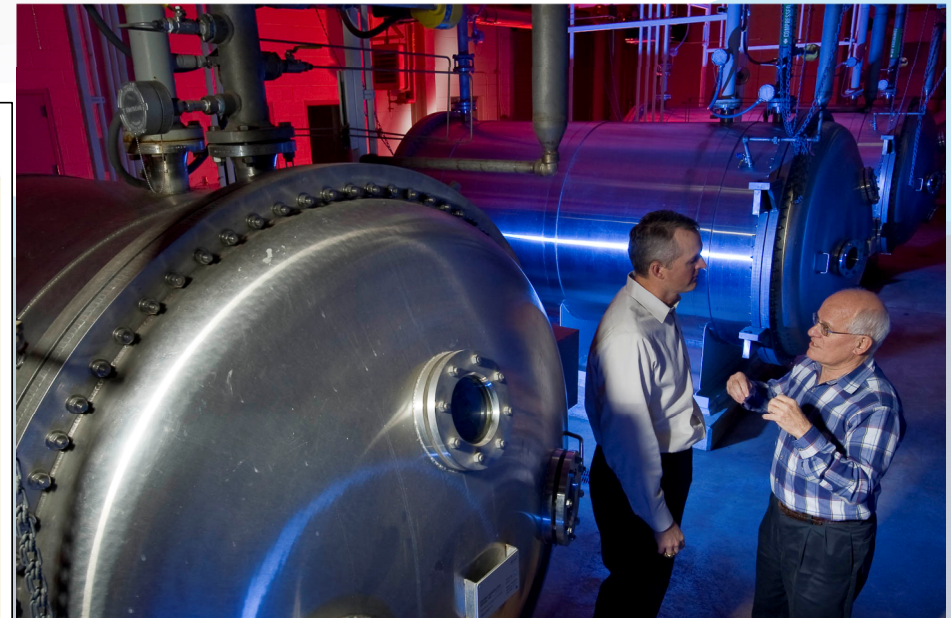
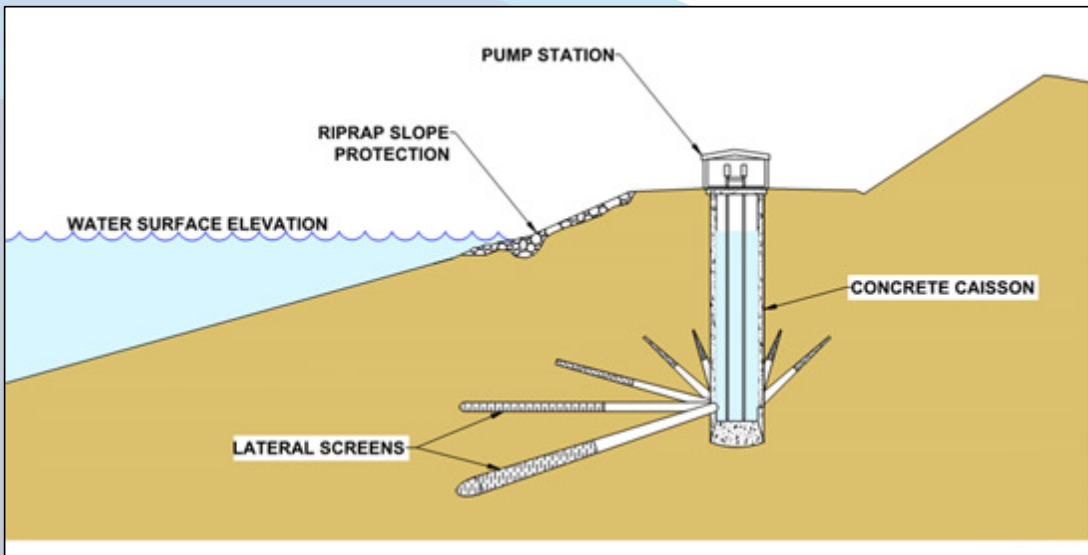


FIG. 4. EXTERIOR—COMPLETED PLANT

LINCOLN WATER SUPPLY TIMELINE

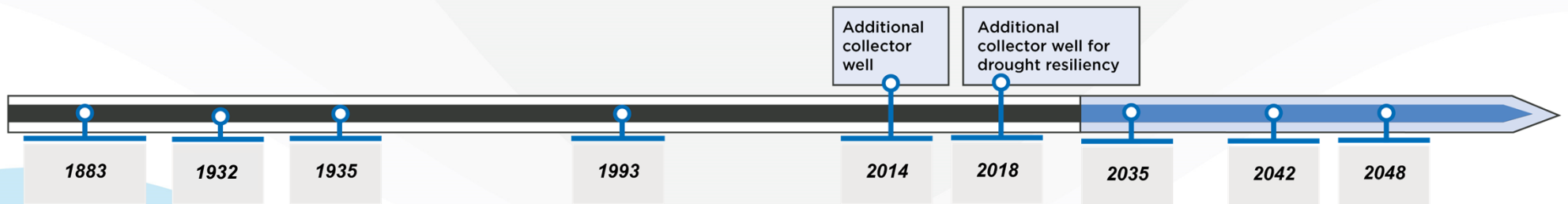


(Horizontal) Collector Well

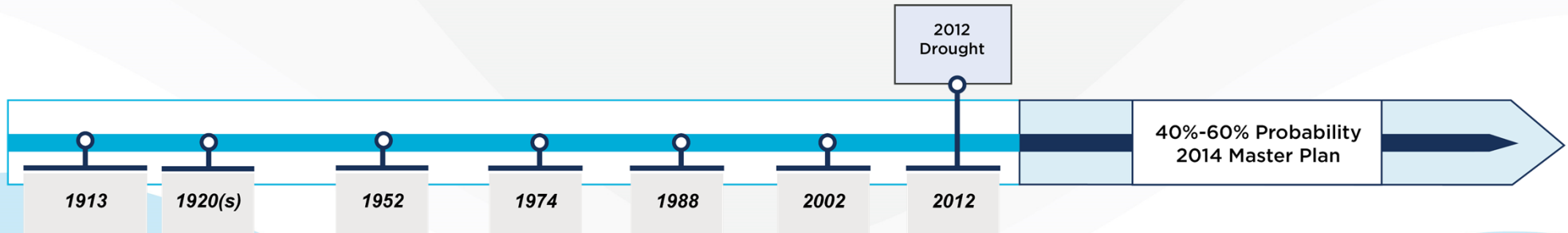


Ozonation for removal of iron and manganese

LINCOLN WATER SUPPLY TIMELINE



LINCOLN WATER SUPPLY TIMELINE



City's water restrictions now mandatory; first time since 2002

Nancy Hicks Aug 9, 2012 Updated Aug 22, 2012 0

Casady defends police waking up water offenders

Lori Pilger Aug 22, 2012 Updated Jan 31, 2017 0

Police expect to ticket more than 100 on first day without warning tickets

Jordan Pascale | Lincoln Journal Star Aug 21, 2012 Updated Jan 31, 2017 0

Water restrictions can turn neighbors on neighbors

Jordan Pascale | Lincoln Journal Star | Aug 16, 2012

"It got so bad some neighbors got into arguments and even some fights over watering on the wrong day," former Mayor Don Wesely said of restrictions in 2002.

Hwy 6 Bridge Looking South 7/27/12



PLATTE RIVER FLOODING MARCH 2019



A publication of the Lincoln Water System in cooperation with the Lincoln Water Consortium

Volume 5
Number 5
Summer 1993

TEAMWORK SANDBAGS FLOOD

Since 1935

the Platte River aquifer
has, without interruption,
quenched Lincoln's thirst.

In early March the largest ice jam in the recorded history of the Platte River in this area caused a flood which nearly cut off Lincoln's water supply.

When the water level finally dropped, Lincoln Water System (LWS) engineers discovered the one remaining raw water line which was supplying Lincoln's needs was exposed to rushing water. Had several public and private entities not worked together to protect and divert the water from the wellfield, Lincoln's water supply would have been severed.

"The people of Lincoln owe a debt of gratitude to many people who helped protect our wellfields," Dick Erickson, Lincoln Public Works Director said.

Erickson credited the employees of Saunders and Sarpy counties, Clark Construction, General Excavating, the Clear Creek Drainage District, Western Sand & Gravel, Burlington-Northern Railroad, and several LWS employees for saving Lincoln's water supply.

The flooded area was six to eight miles long and three miles wide, or 24 square miles which is about one-third the size of Lincoln. Flood water was moving 100,000 cubic feet per second past a given point or 64 billion gallons a day. This is equivalent

to Lincoln's annual consumption of water in five years.

It will take years to restore the damage done to businesses, private homes and the land. Preliminary damage estimates for the flood were set at \$16 million. Damage to Lincoln Water System facilities is estimated at \$3 to \$4 million.

The flood was declared a federal emergency. As a result LWS will pay 12.5% of the cost with the state of Nebraska paying another 12.5%, and the Federal Emergency Management Agency picking up the remaining 75%.

The flood washed out the 48-inch and 54-inch transmission mains which transport water from the wellfield to the treatment plant. The 48-inch line was constructed in the 1950s and parts of the line were buried 10 to 15 feet below ground. The 54-inch line was installed as part of the Ashland expansion.

The flood also washed out OPFD power lines serving nine wells and the Thomas Lake residential development. One well was nearly washed away.

The road leading to the new island wellfield has been reconstructed at a cost of \$150,000. The project includes re-grading and filling in gouged out areas with sand, gravel and rip-rap.

The good news is the bridge leading to the island wellfield was not damaged nor were the two new horizontal wells on the island. Roads in the north wellfield will require \$40,000 in repairs. Salvaging the 48-inch and 54-inch pipe and constructing a diversion channel and dikes will cost approximately \$189,000.

The City has received bids on most of the repair work and reconstruction is under way. The Army Corps of Engineers is also repairing dikes which hopefully will keep the Platte River within its banks and protect the wellfields.

Engineers are also devising solutions to handle water near the railroad trestle where the 48-inch and 54-inch mains were washed out. A rip-rapped diversion channel for excess water is under consideration, as is a settling pond which would slow down the flow of water in the area. Mains running near the trestle may also be buried deeper.

Though the flood will affect the amount of work that needs to be done to complete the Ashland expansion, the project should be completed nearly on schedule.

A section of 54" pipe
before the March flood.



PLATTE RIVER FLOODING MARCH 2019



WATER SUPPLY REDUNDANCY AND RESILIENCY

- Natural and human caused events
- Meet expected level of service to customers
- Economic development

Lincoln, Nebraska

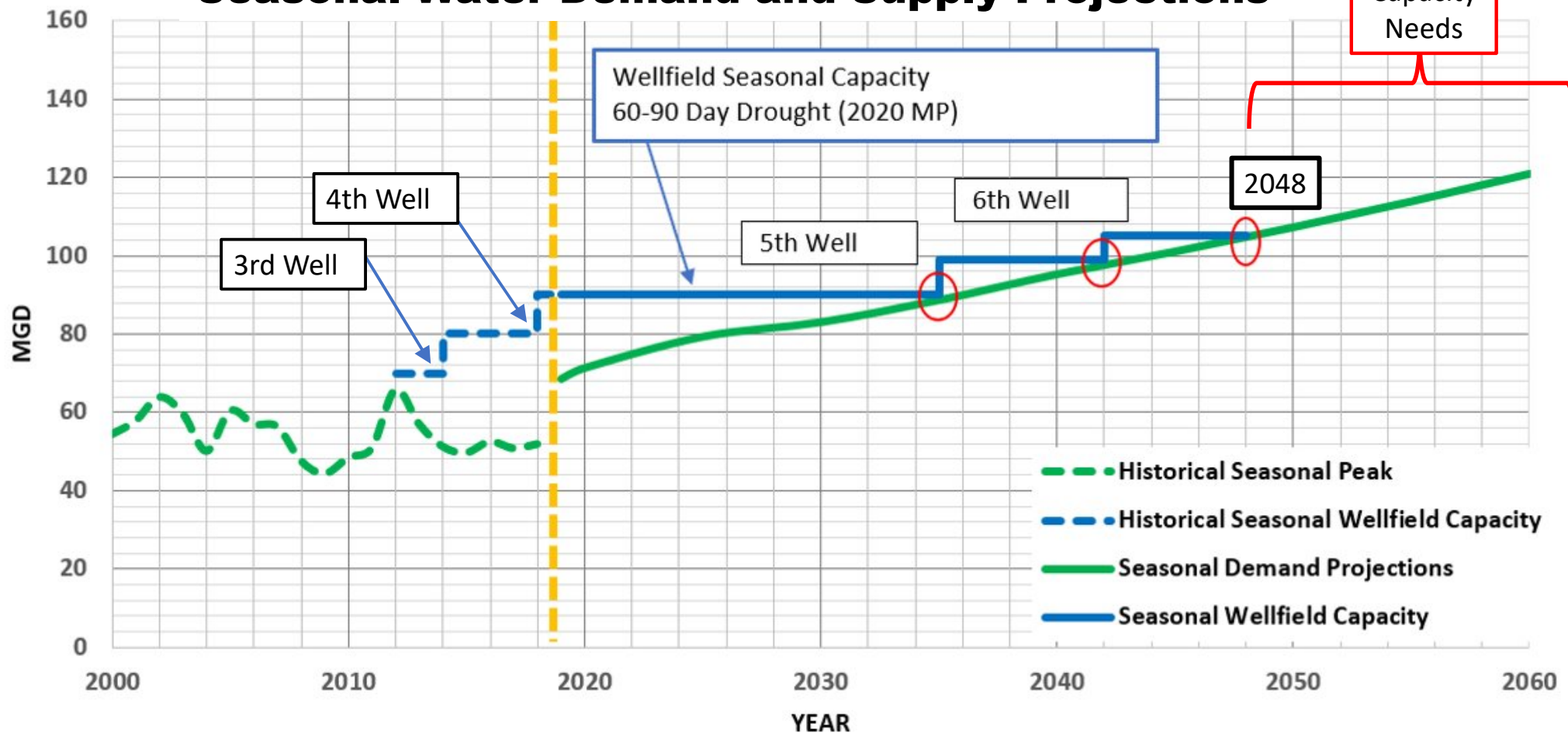


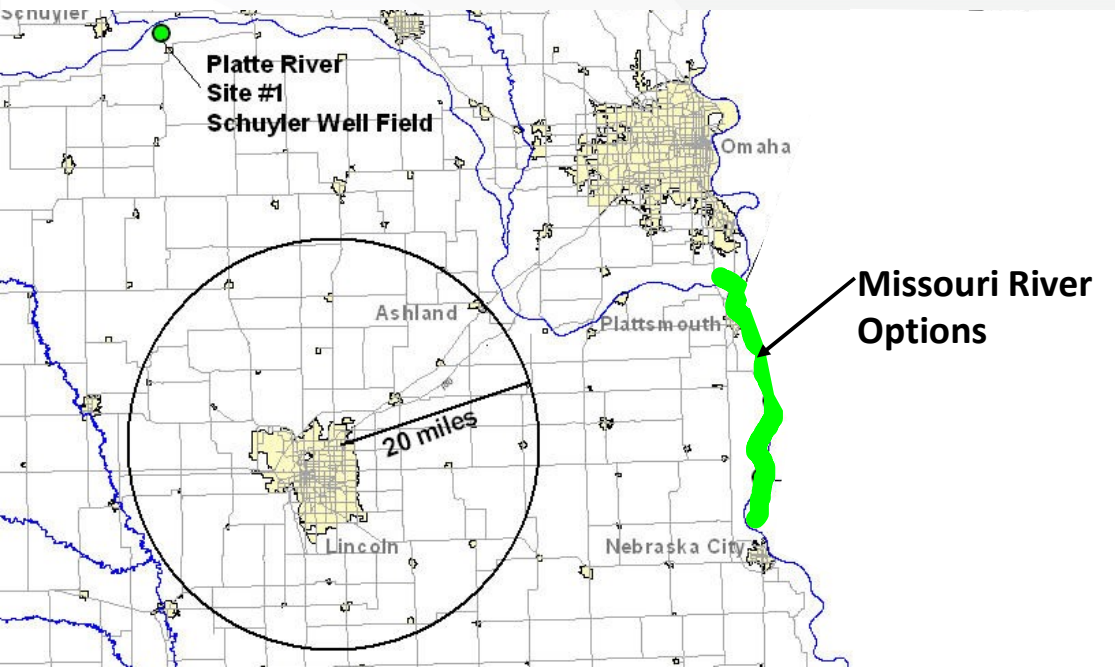
John Coletti via Getty Images

A recent report from the [Columbia University Water Center](#) listed Nebraska in the top 10 areas with the highest risk for water scarcity. Earlier in 2013, nearly the entire state of Nebraska was in the middle of a severe drought with a staggering 96 percent of the state experiencing "extreme drought" conditions, according to a report from [24/7 Wall St.](#) Of the 225 cities that the University of Florida's 2012 [water report](#) surveyed, Lincoln was listed as the third most at-risk city for water shortage. *Estimated population: 265,404 (72nd most populous U.S. city), metro: 310,342 (158th most populous in U.S.)*

Lincoln Water System Master Plan

Seasonal Water Demand and Supply Projections



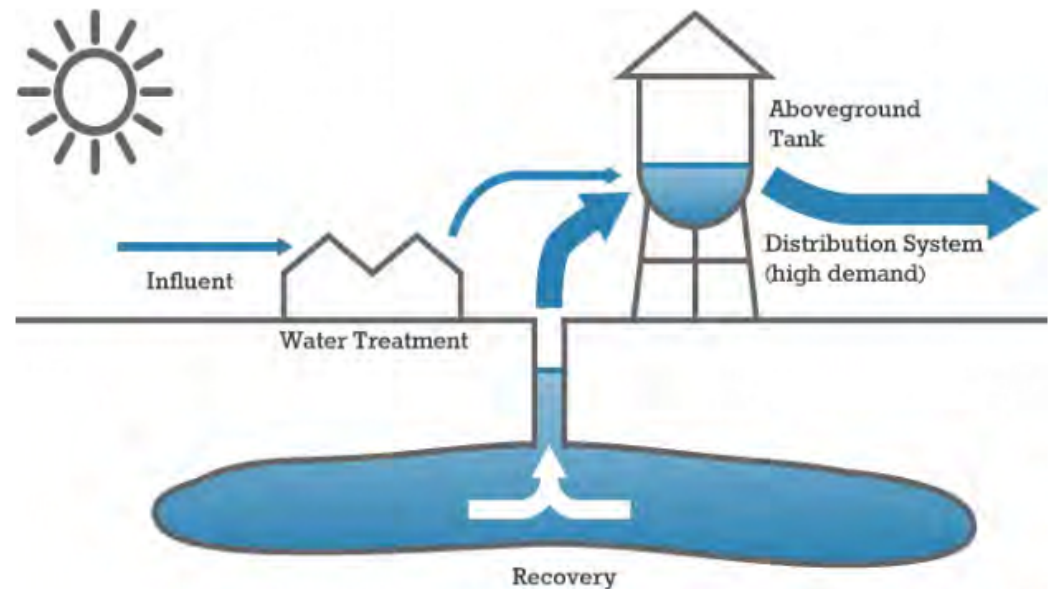


SUPPLY OPTIONS CONSIDERED

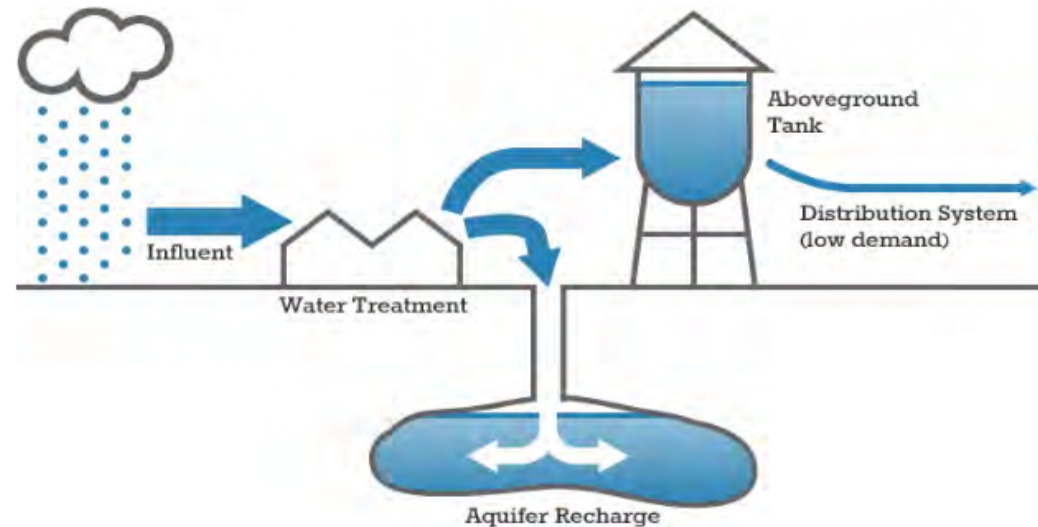
- 2006 Study – MO River, Other aquifers, Platte River at Schuyler

SUPPLY OPTIONS CONSIDERED

- 2014 Master Plan
 - Short-term Supply Options
 - Expand existing well field
 - New well field in High Plains/ Ogallala Aquifer – Blue River Basin
 - Aquifer storage and recovery (ASR) as peak shaving
 - MUD interconnect
 - Water Reuse Option
 - Conservation



Source: <http://indewater.com/aboutasr/>



Source: <http://indewater.com/aboutasr/>

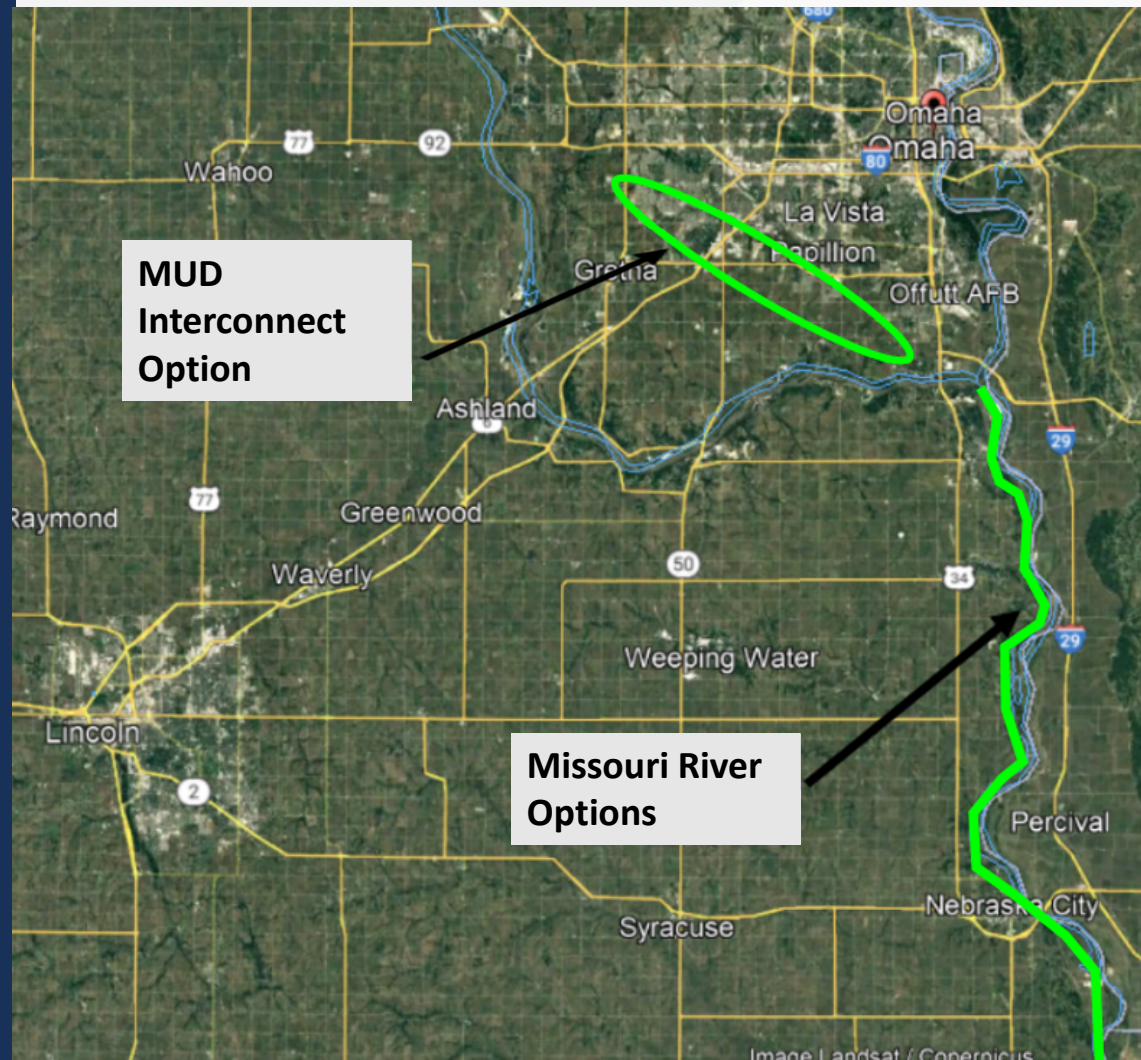
Photo Redacted

SUPPLY OPTIONS CONSIDERED

- 2014 Master Plan
 - Mid-Term Options
 - Expand existing wellfield – maximize capacity
 - Surface water reservoir

SUPPLY OPTIONS CONSIDERED

- 2014 Master Plan
 - Long-Term Options
 - Missouri River
 - Platte River





ALTERNATIVE EVALUATION PROCESS

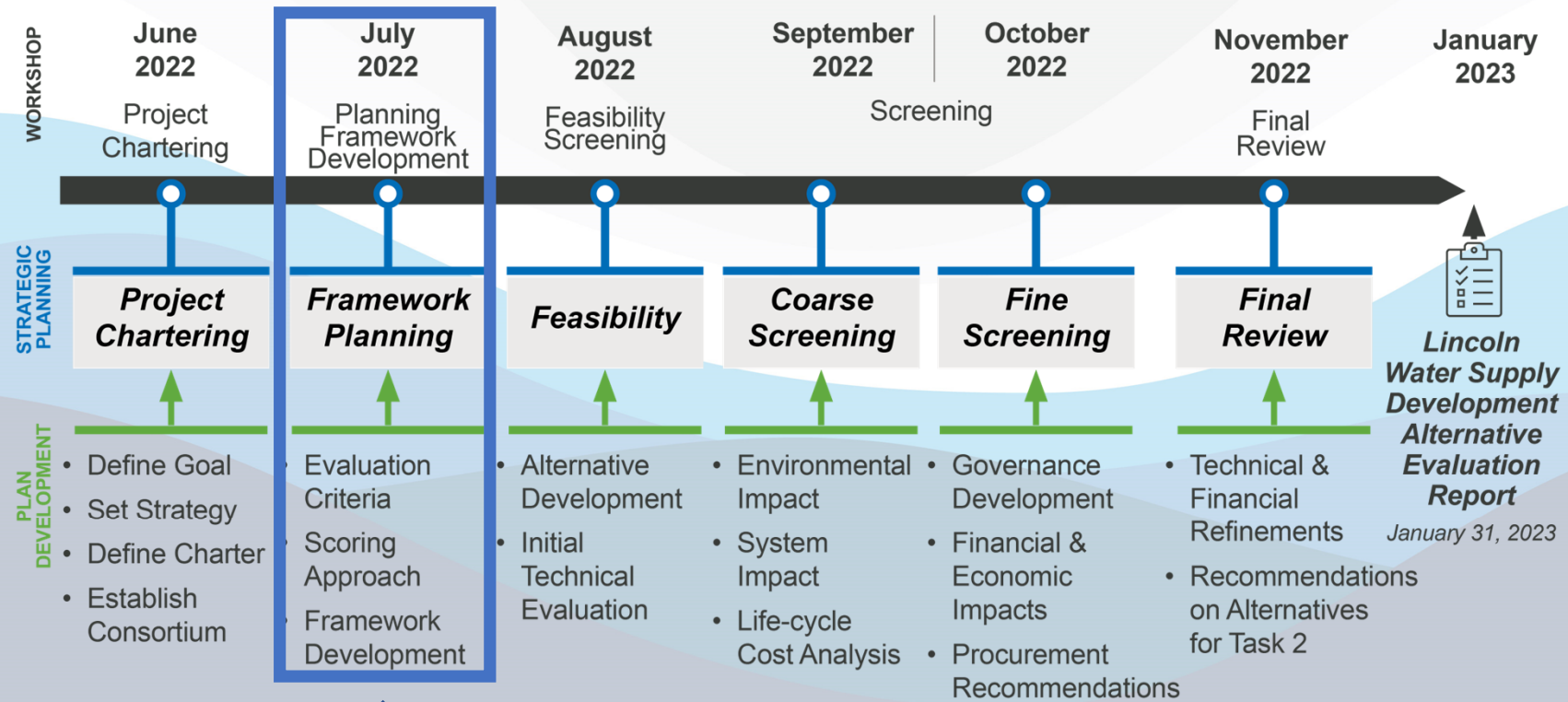


FRAMEWORK PLANNING PROCESS

WORKPLAN

July 19, 2022

The City's Alternatives Identification and Analysis

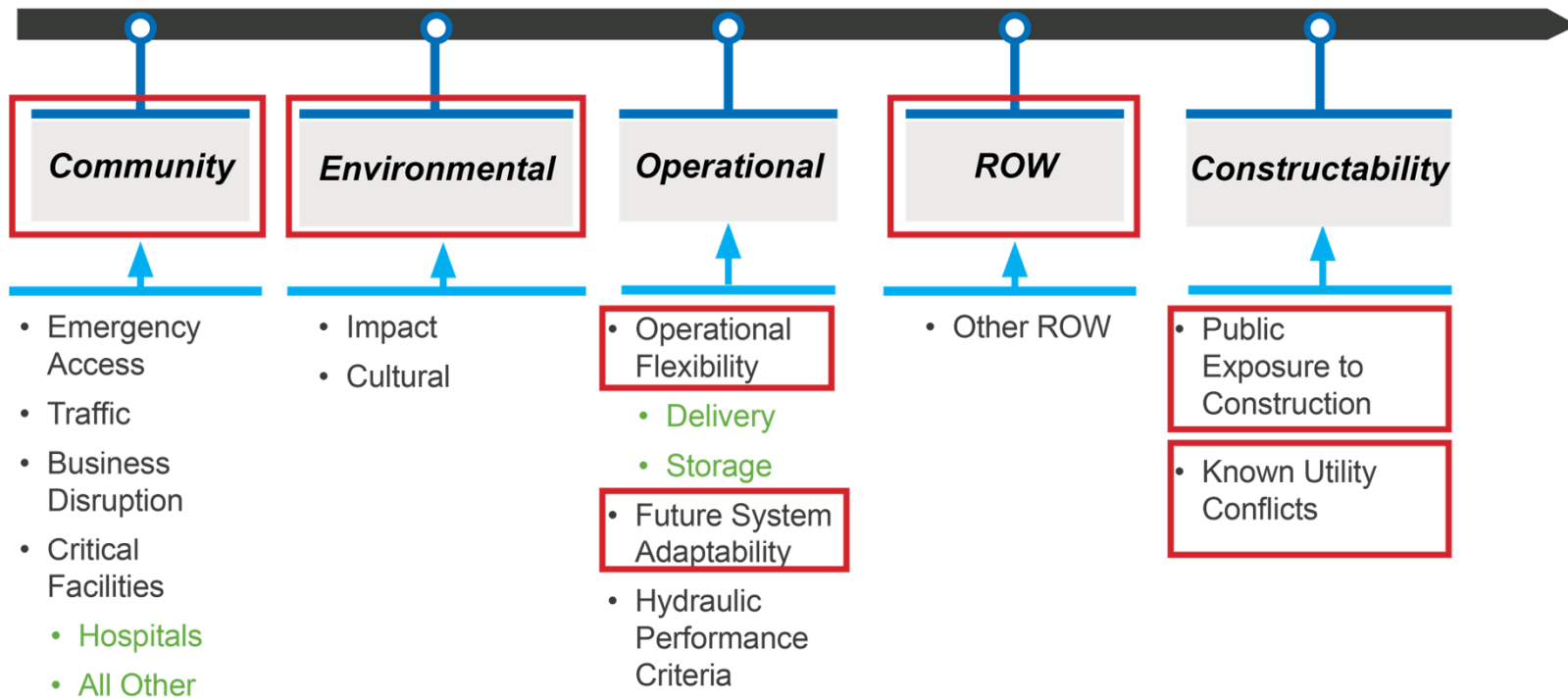


Western Water Supply

- ... Existing Pipeline
- Pipeline Alignments
- Tunnel Alignments
- Flow Control Facility
- Possible Tunnel Shaft/Portal
- Reservoir (MG)
- Pump Stations (Not Shown)



EVALUATION CRITERIA

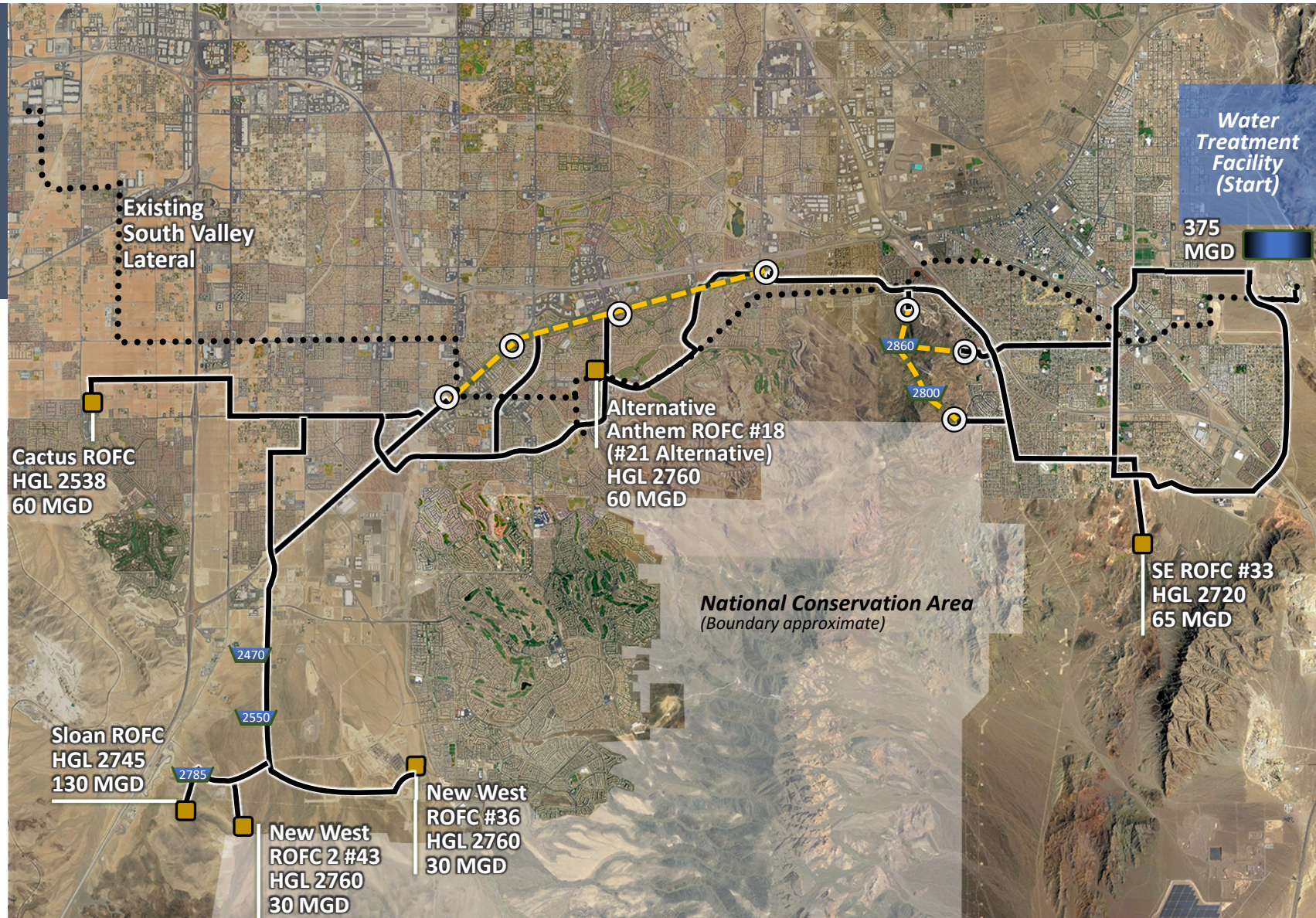


CRITERIA	DESCRIPTION	WEIGHT
Community	Disruption of public, business, critical facilities (hospitals, schools).	20%
Environmental	Impact to environment and cultural resources. Challenging to permit.	10%
Operational Flexibility	Does not impact system operations.	20%
Future Adaptability	Synergetic with future projects.	15%
ROW	Ability to secure necessary right-of-way.	10%
Constructability	Public exposure to construction activities. Safety.	15%
Utility Conflicts	Conflicts with existing utilities. Loss of service. Construction risk.	10%



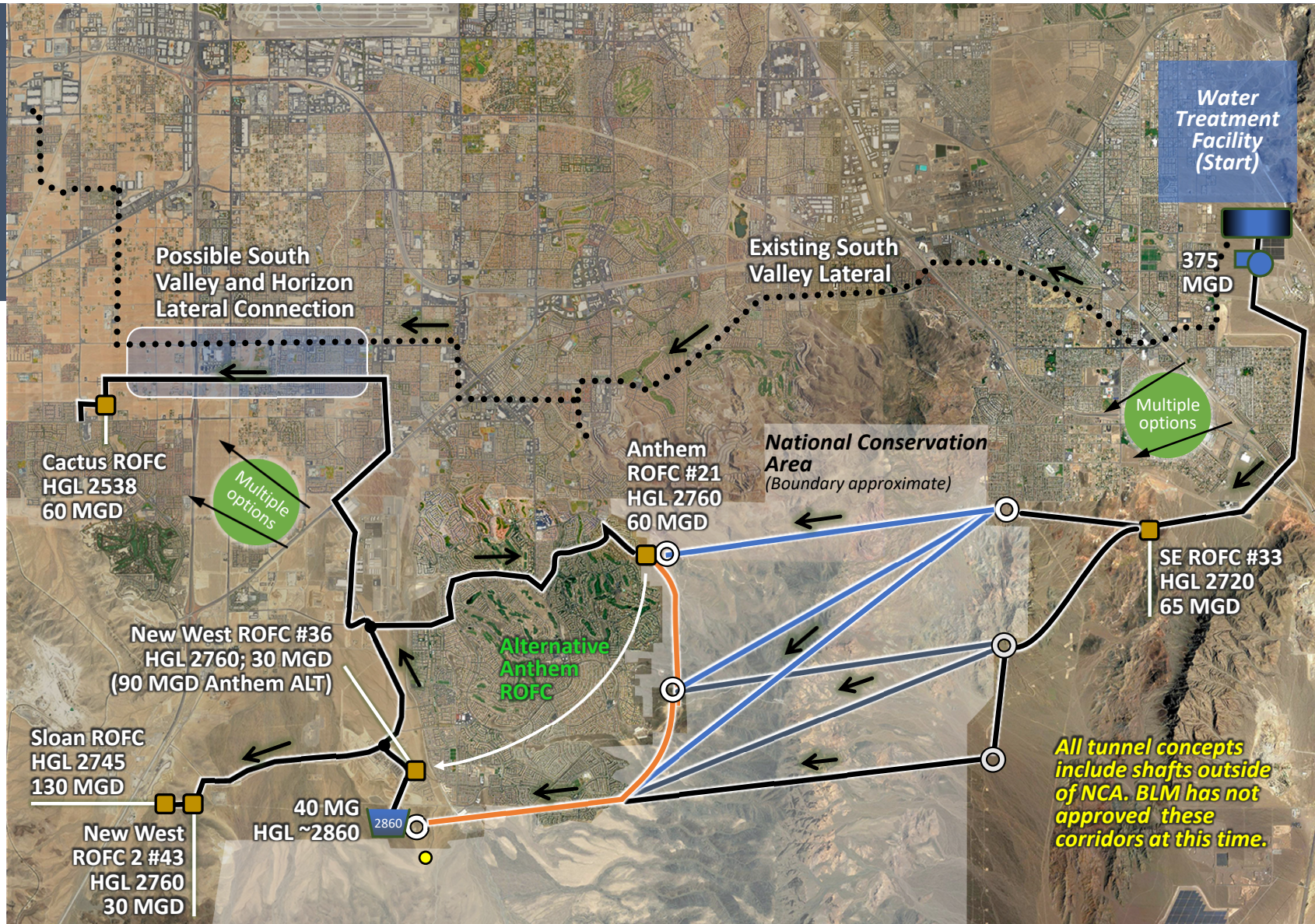
NORTH CORRIDOR

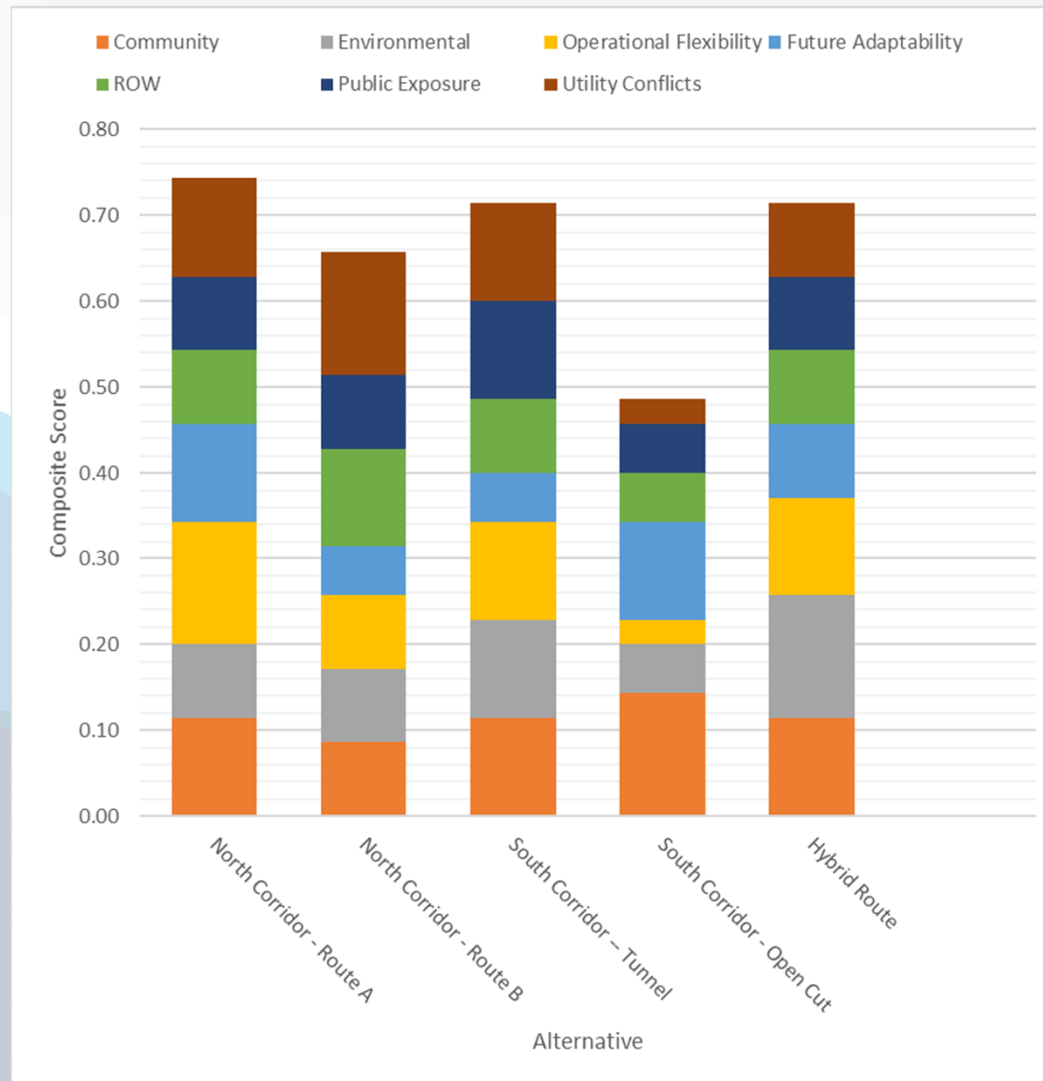
- ... Existing SVL Pipeline
- Pipeline Alignments
- Tunnel Alignments
- Flow Control Facility
- ⊙ Possible Tunnel Shaft/Portal
- ▒ Reservoir (40 MG)
- ⊙ Pump Stations (Not Shown)



SOUTH CORRIDOR

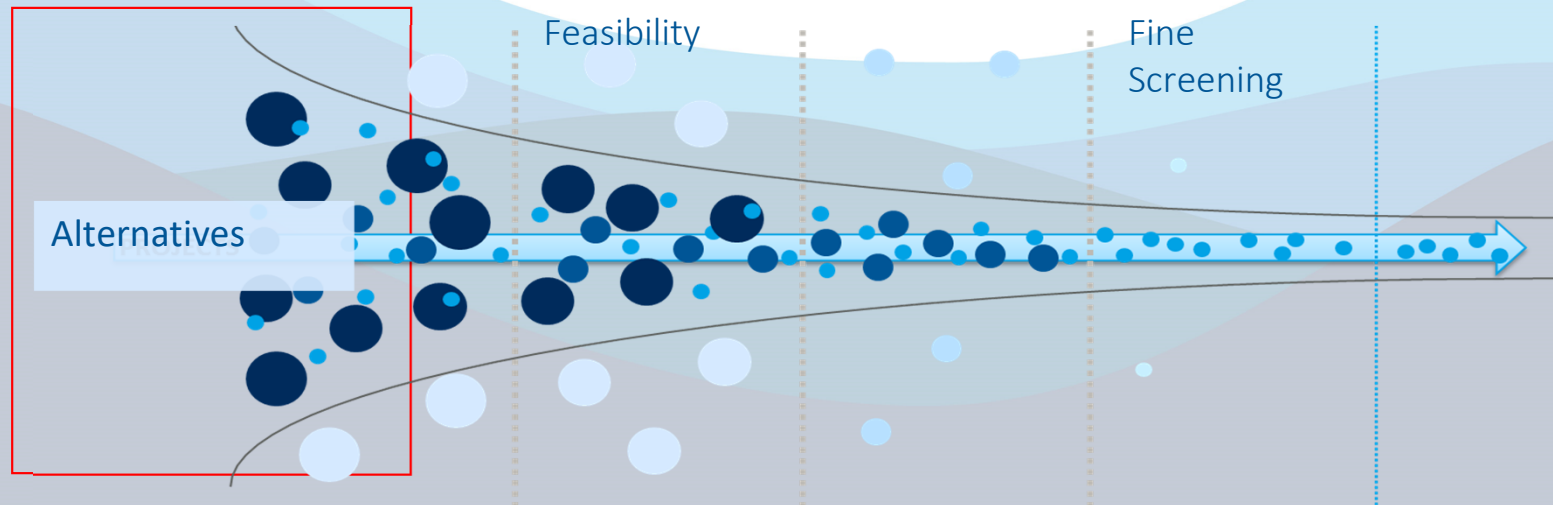
- ... Existing Pipeline
- Pipelines with Options
- Tunnel Concepts (Colored pipes)
- Flow Control Facility
- Possible Tunnel Shaft/Portal
- Reservoir
- Pump Station
- Flow Direction





EVALUATION CRITERIA

- Evaluation criteria and scoring of alternatives are tools to spawn critical thinking and prioritize alternatives that align with your priorities
- Not a tool to determine absolute “winner”
- First sieve in the process





LEVELS OF CONSENSUS

Consensus is considered to have been achieved if all participants indicate they are at Levels 1 through 4

THE LEVELS OF CONSENSUS ARE:

1. I can say an unqualified 'yes' to the decision. I am satisfied that the decision is an expression of the wisdom of the group.
2. I find the decision perfectly acceptable.
3. I can live with the decision; I'm not especially enthusiastic about it.
4. I do not fully agree with the decision and need to register my view about it. However, I do not choose to block the decision. I am willing to support the decision because I trust the wisdom of the group.
5. I do not agree with the decision and feel the need to stand in the way of this decision being accepted.
6. I feel that we have no clear sense of direction of unity in the group. We need to do more work before consensus can be reached.



DETERMINING EVALUATION CRITERIA

EVALUATION CRITERIA TO CONSIDER

Potential Criteria

1. Long-Term Viability
2. Operational Flexibility
3. Governance
4. Implementation Risks
5. Time to Implement
6. Permitting Requirements
7. Environmental Stewardship
8. Water Rights
9. Socioeconomic Factors



EVALUATION CRITERIA TO CONSIDER

1. Long-Term Viability

- Does the option provide the 50 years supply capacity needs or whatever planning horizon the City selects?
- Does the option support the City's economic and population growth?





EVALUATION CRITERIA TO CONSIDER

2. Operational Flexibility

- Will the proposed alternative allow for the flexibility of supply sources to increase the reliability of the system?
- Will operations become more complex and to what degree?

EVALUATION CRITERIA TO CONSIDER

3. Governance

- How important is it to be autonomous?
- What level of difficulty could arise from creating a water utility with a governing body or combining with MUD?





EVALUATION CRITERIA TO CONSIDER

4. Implementation Risks

- What are the risks to implementation?
- Water quality, blending, treatability of raw water.

EVALUATION CRITERIA TO CONSIDER

5. Time to Implement

- What is the timeline to implement additional water capacity and resiliency?
- Will the required timeline meet the City's anticipated schedule / need for capacity and resiliency?





EVALUATION CRITERIA TO CONSIDER

6. Permitting Requirements

- What types of permits will be required and what is the difficulty of obtaining permits? (NDOT, USACE 404 and 408, Railroad, etc...)

EVALUATION CRITERIA TO CONSIDER

7. Environmental Stewardship

- Will the project adversely impact the environment?
- Will there be historical or cultural impacts or impacts to threatened and endangered species?
- From an overall perspective which alternative has less impact (one example is waste produced by treatment process)?





EVALUATION CRITERIA TO CONSIDER

8. Water Rights

- Is there a supply limitation present based upon water rights?
- What is the risk of having junior water rights?

EVALUATION CRITERIA TO CONSIDER

9. Socioeconomic Factors

- How does the water supply alternative impact the affordability of water especially for individuals who can least afford it?





EVALUATION CRITERIA TO CONSIDER

What have we missed?

**Should other criteria
be added?**

slido



Select all that you feel are relevant
evaluation criteria

slido



Prioritize by selecting what you feel are the top 7 evaluation criteria



SCORING APPROACH



PUBLIC QUESTIONS

The background features a series of overlapping, wavy lines in various shades of blue and grey. The top section has lighter grey and blue waves, while the bottom section has darker blue waves. The text is centered in the white space between these two wave patterns.

CLOSING THOUGHTS