Norman Utilities Authority

2060 Strategic Water Supply Plan

Public Meeting #3

March 13, 2013

AGENDA

- Project overview and update on progress
- Quick review of supply options and evaluation criteria
- Portfolio evaluations
- Feedback and discussion on supply portfolios

Project Overview and Update on Progress

Public Meeting 1 (June 2012)

- Basis of Planning
  - Demand, supply options, and evaluation criteria

Public Meeting 2 (October 2012)

- Phase 1 – Individual Water Supply Options

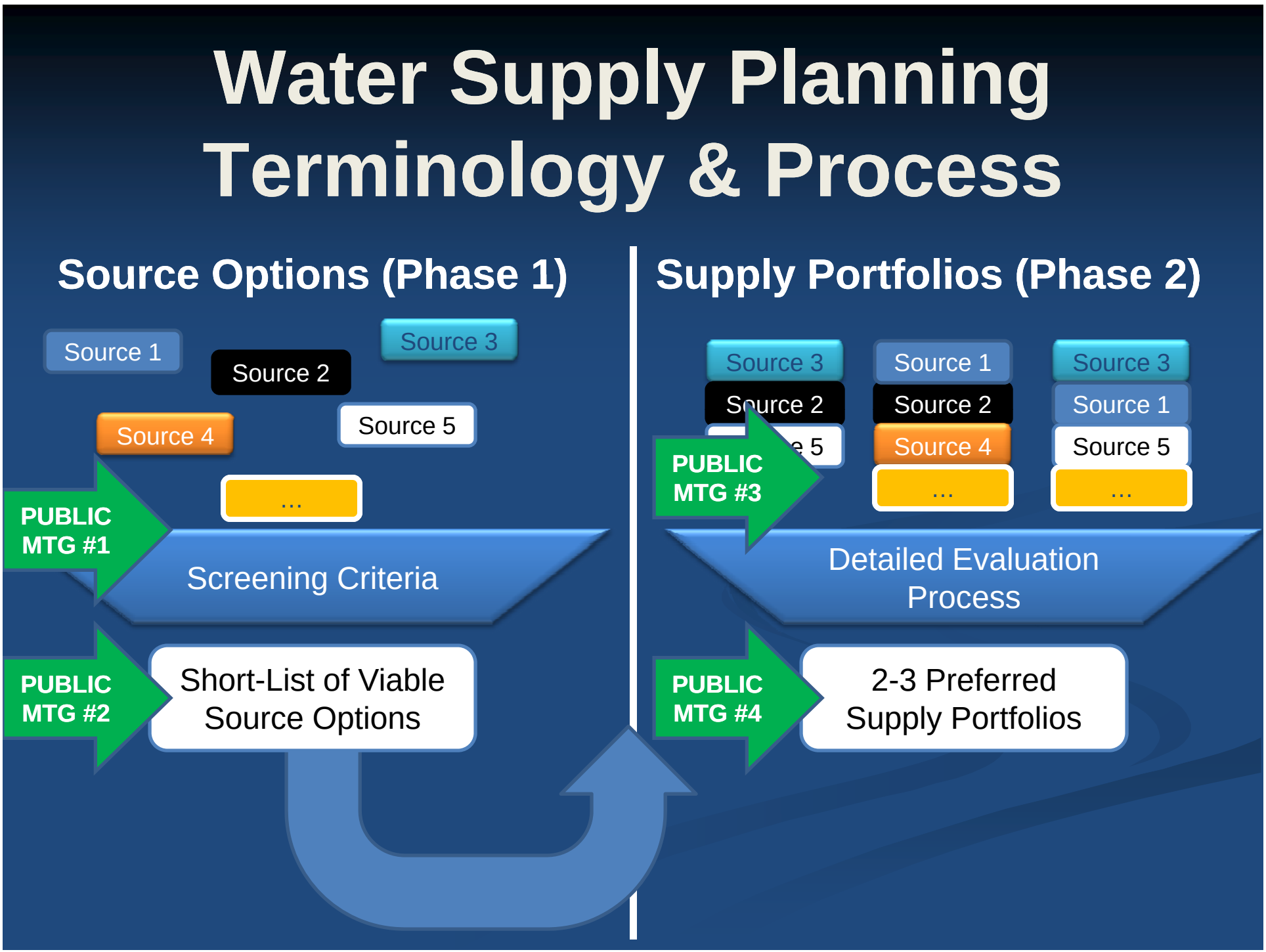
Public Meeting 3 (Tonight)

- Phase 2 (part A) – Future Water Supply Portfolios
  - Evaluation of initial supply portfolios

Public Meeting 4

- Phase 2 (part B) – Future Water Supply Portfolios
  - Evaluation of revised portfolios

Water Supply Planning Terminology & Process



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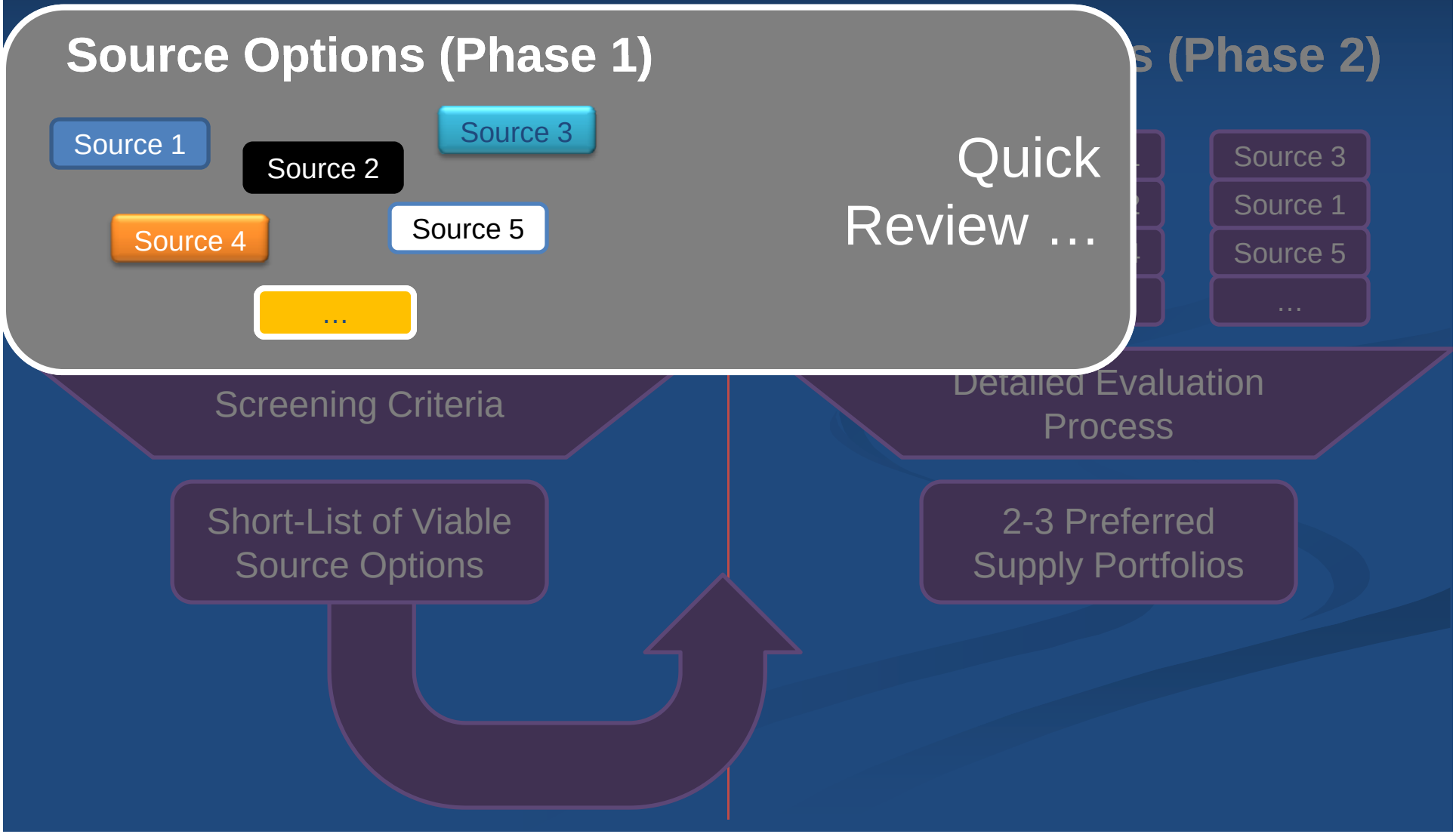
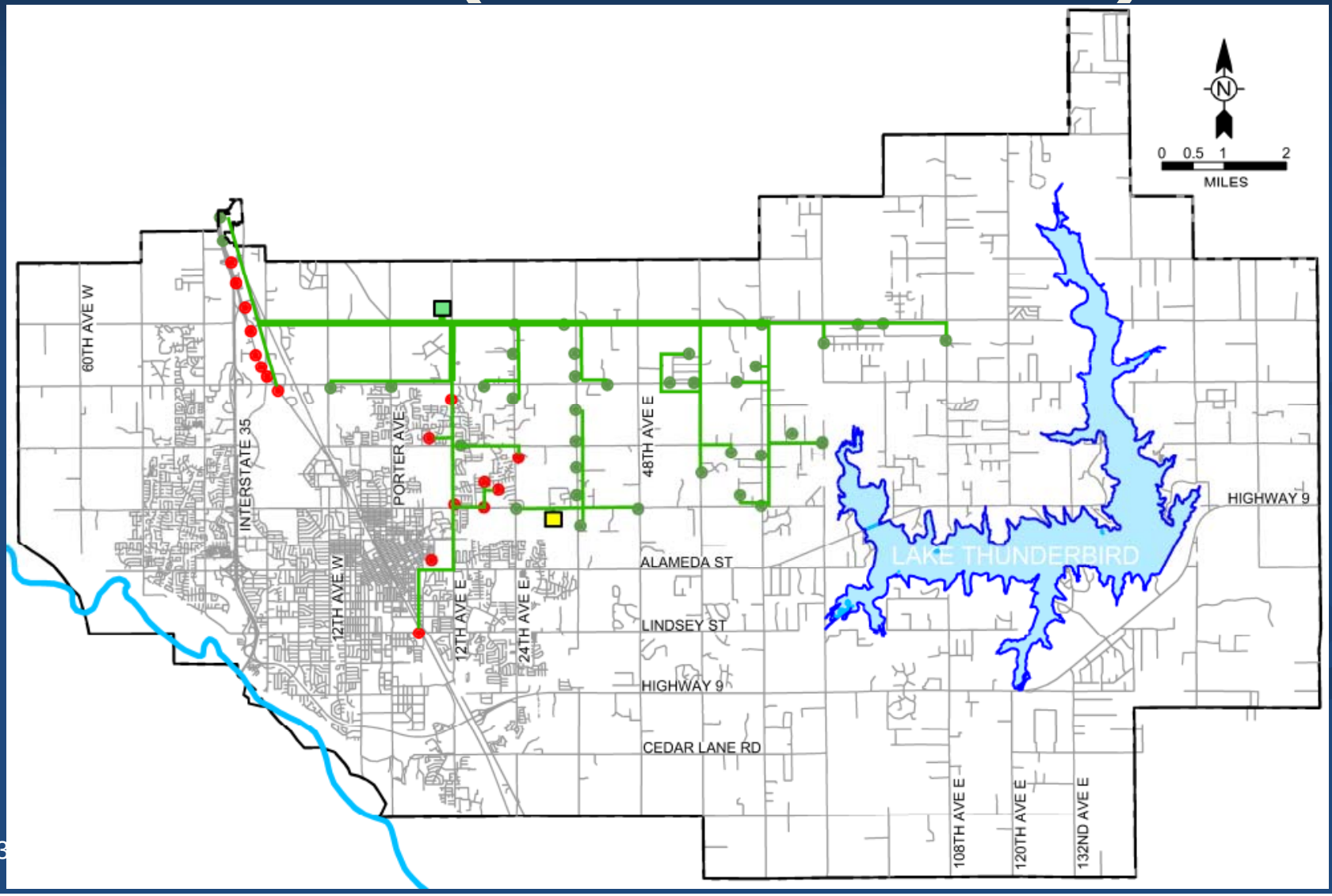
Review of Supply Sources and Evaluation Criteria



Water Supply Options

Existing Sources	New Local Sources	New Regional Sources
Lake Thunderbird (at firm yield)	Additional conservation	Co-owner with OKC for SE Oklahoma treated water
Garber Wellington Aquifer Wells (with treatment)	Direct non-potable reuse (purple pipe)	Co-owner with OKC for SE Oklahoma raw water
Intermittent purchase of treated water from OKC (wholesale)	Indirect potable reuse (Lake Thunderbird augmentation)	Scissortail Reservoir
Conservation and reuse	Indirect potable reuse (groundwater recharge)	Parker Reservoir
	Stormwater capture and reuse	Kaw Lake
	Canadian River Diversion	
	Capture Lake Thunderbird spillage	
	Dredging Lake Thunderbird	

Garber Wellington Aquifer Wells (with treatment)



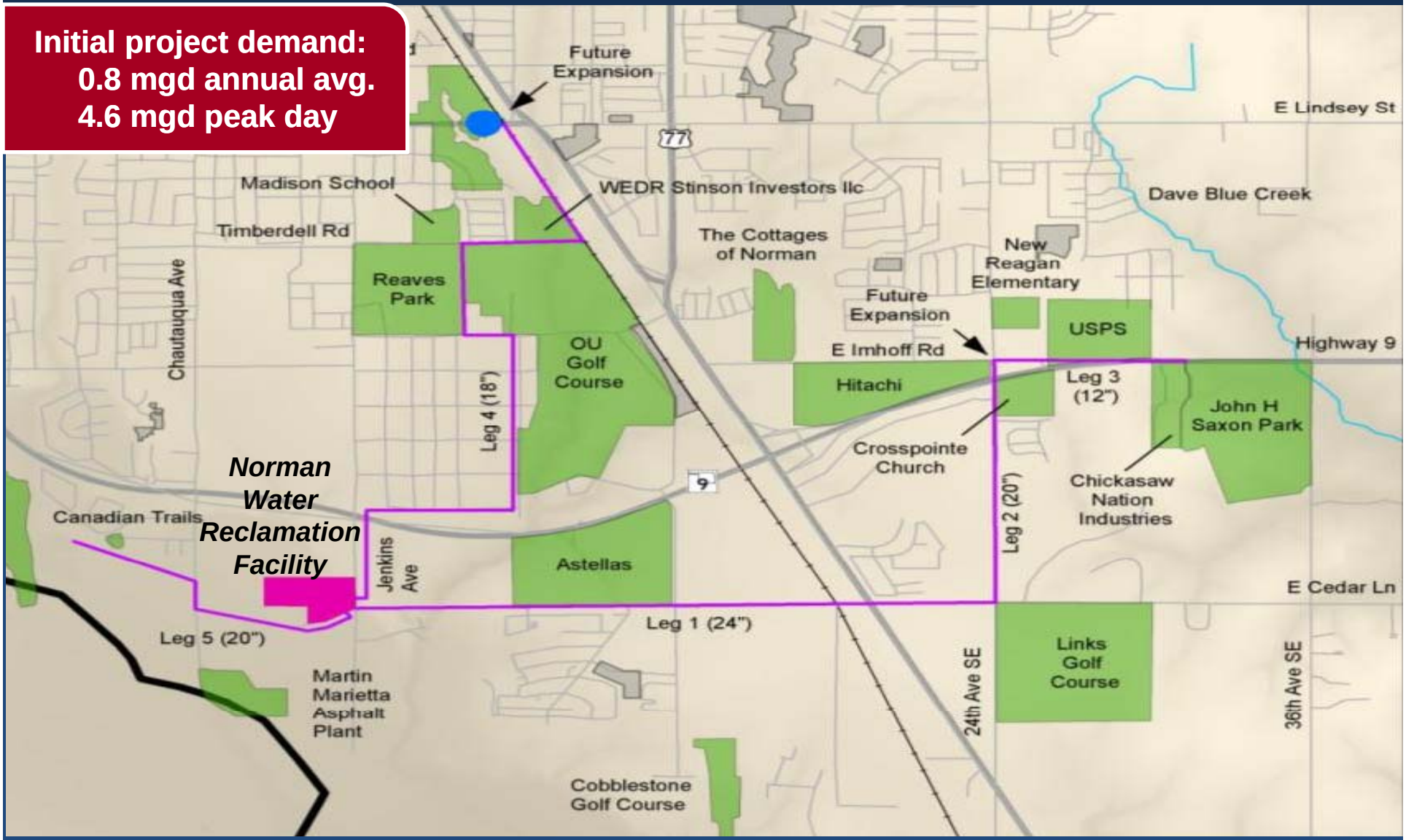
Potential Additional Conservation Savings for Norman (Post 2010)

Oklahoma Comprehensive Water Plan OCWP	Scenario I (mgd)*	Scenario II (mgd) *
2020	0.70	1.6
2030	0.74	1.9
2040	0.77	2.3
2050	0.79	2.5
2060	0.81	2.6

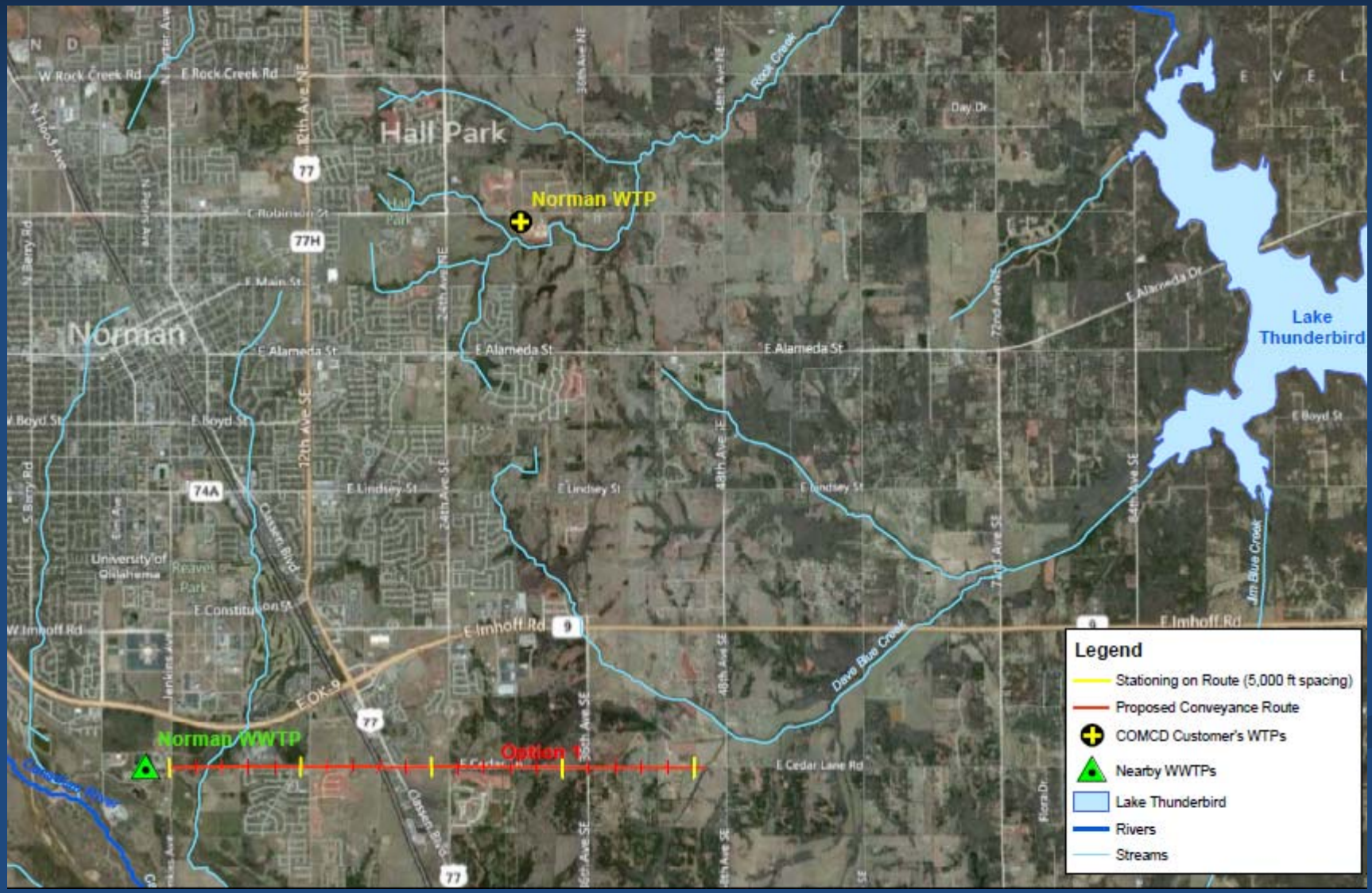
* 60% of OCWP estimates for Cleveland County

Direct Non-Potable Reuse

Initial project demand:
0.8 mgd annual avg.
4.6 mgd peak day



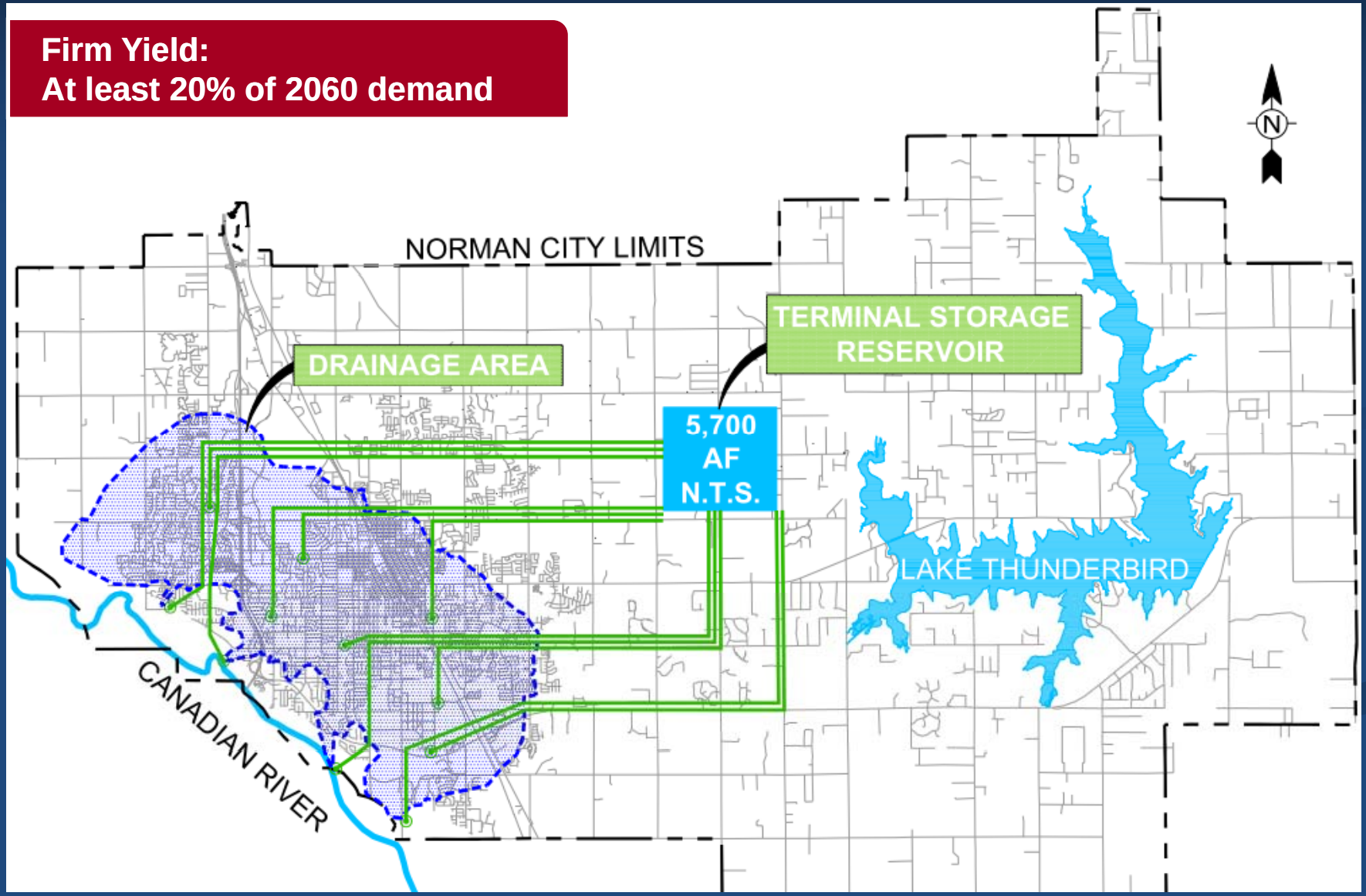
Lake Thunderbird Augmentation



From COMCD 2012 Lake Thunderbird Water Reuse Feasibility Study

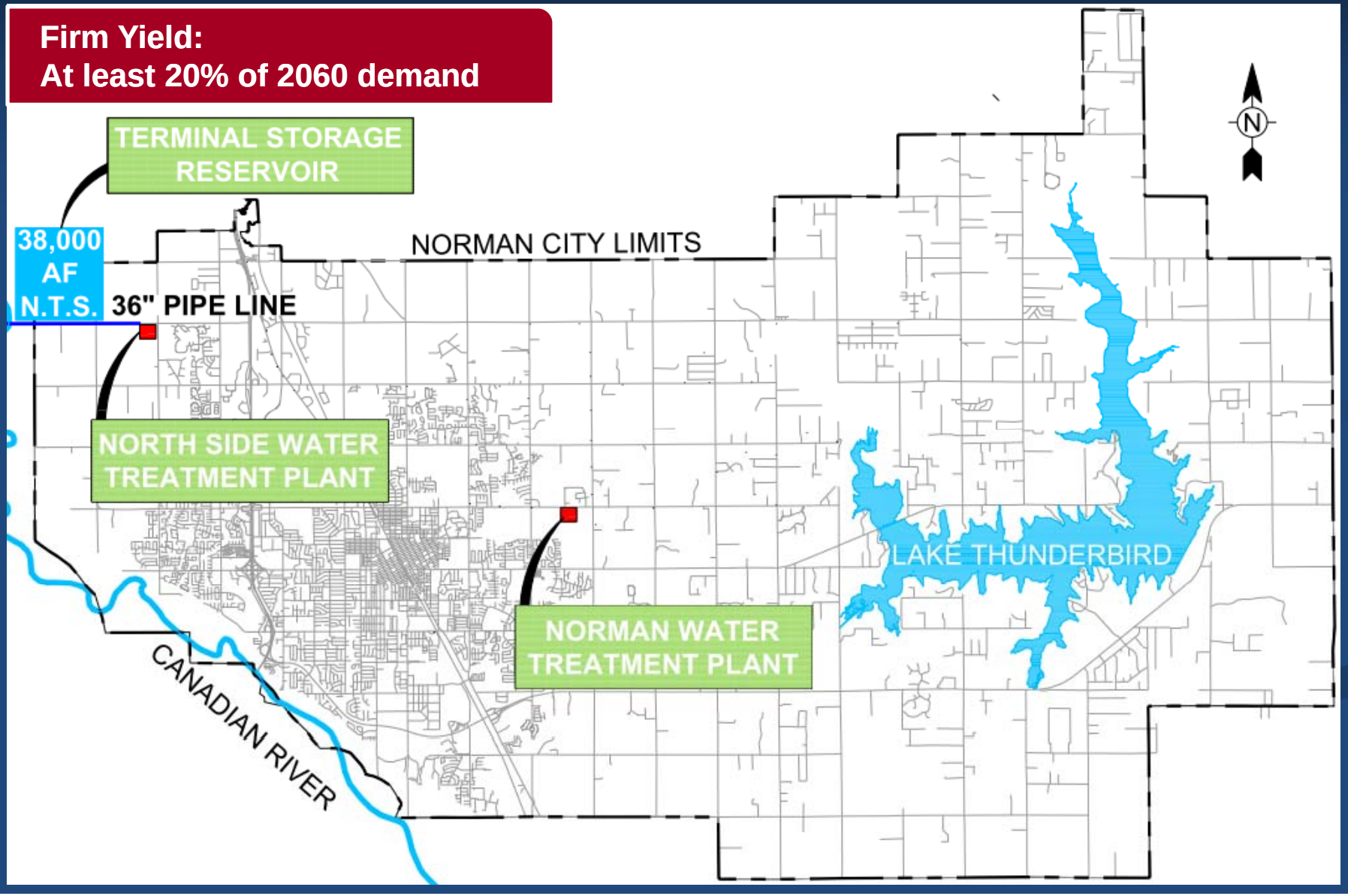
Stormwater Capture

Firm Yield:
At least 20% of 2060 demand



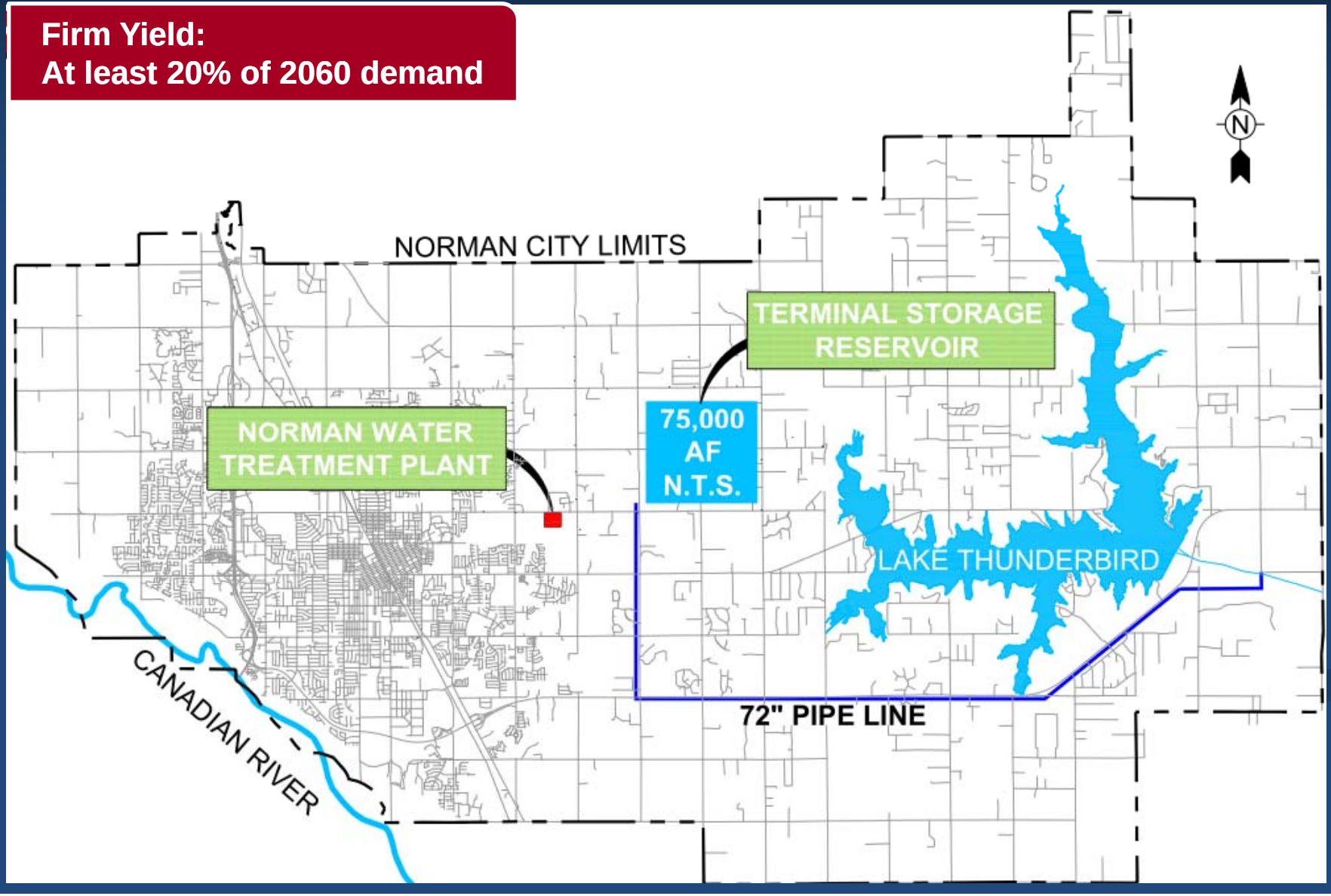
Canadian River Diversion

Firm Yield:
At least 20% of 2060 demand



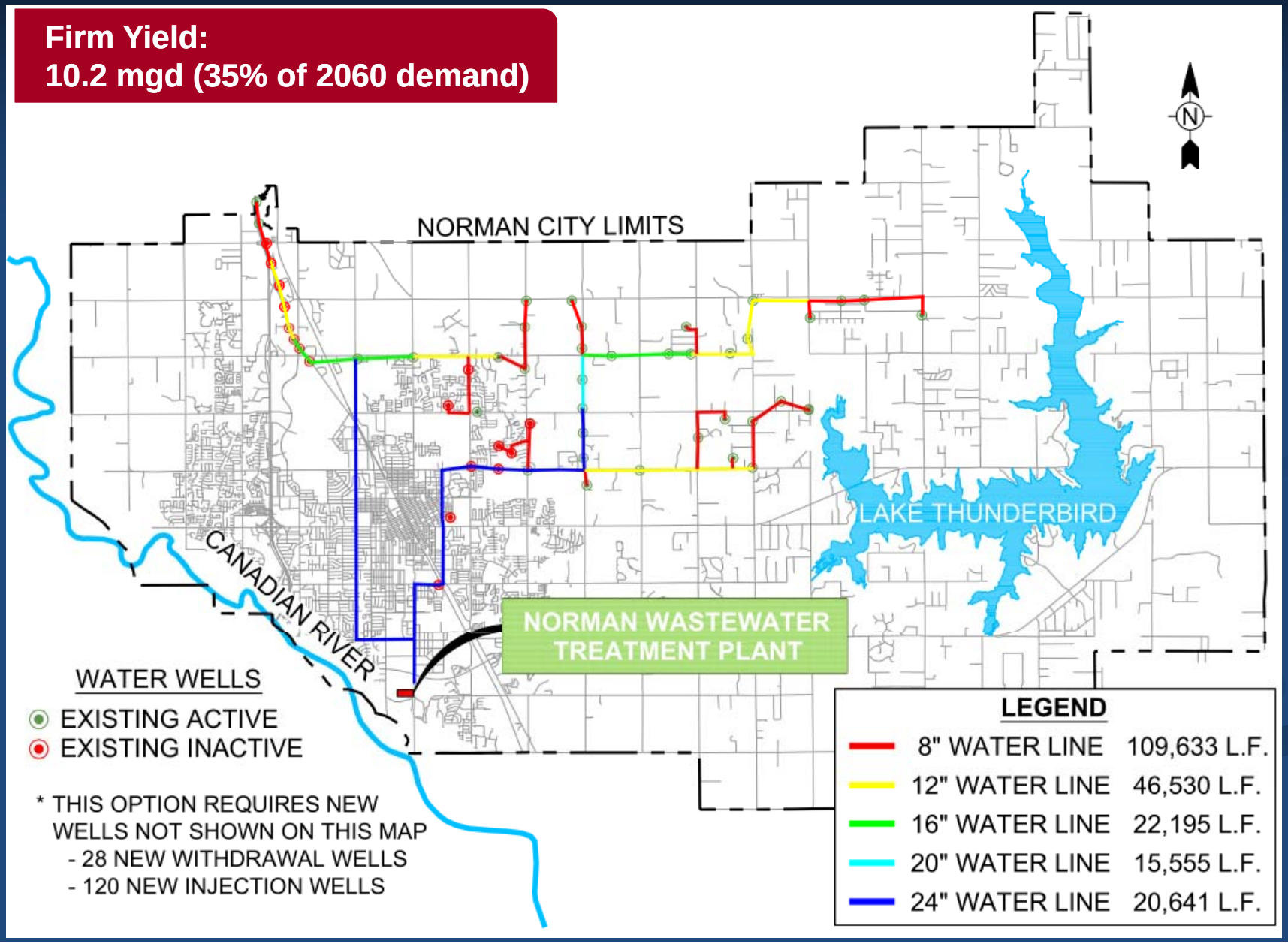
Capture Lake Thunderbird Spillage

Firm Yield:
At least 20% of 2060 demand

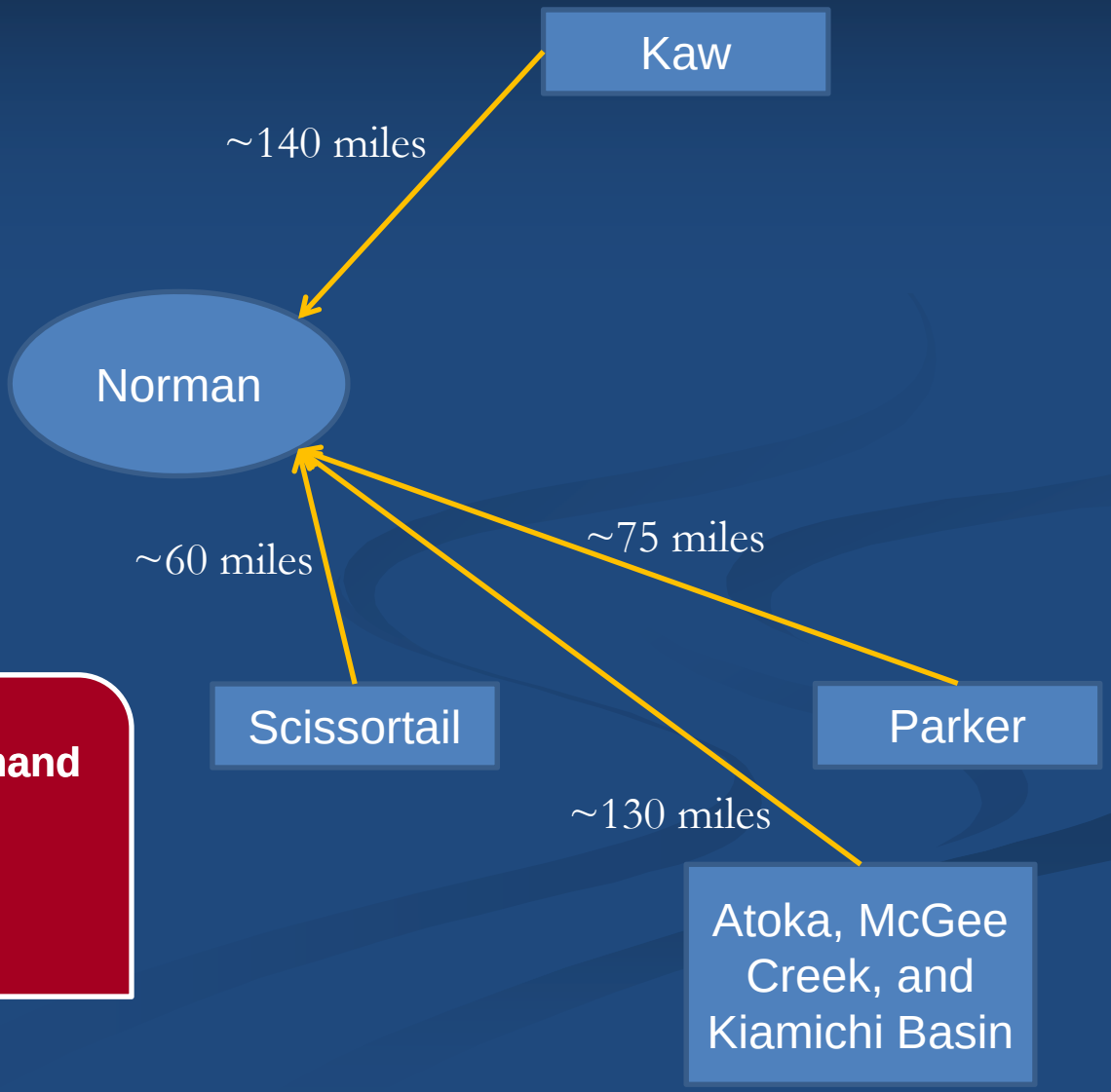


Groundwater Recharge

Firm Yield:
10.2 mgd (35% of 2060 demand)

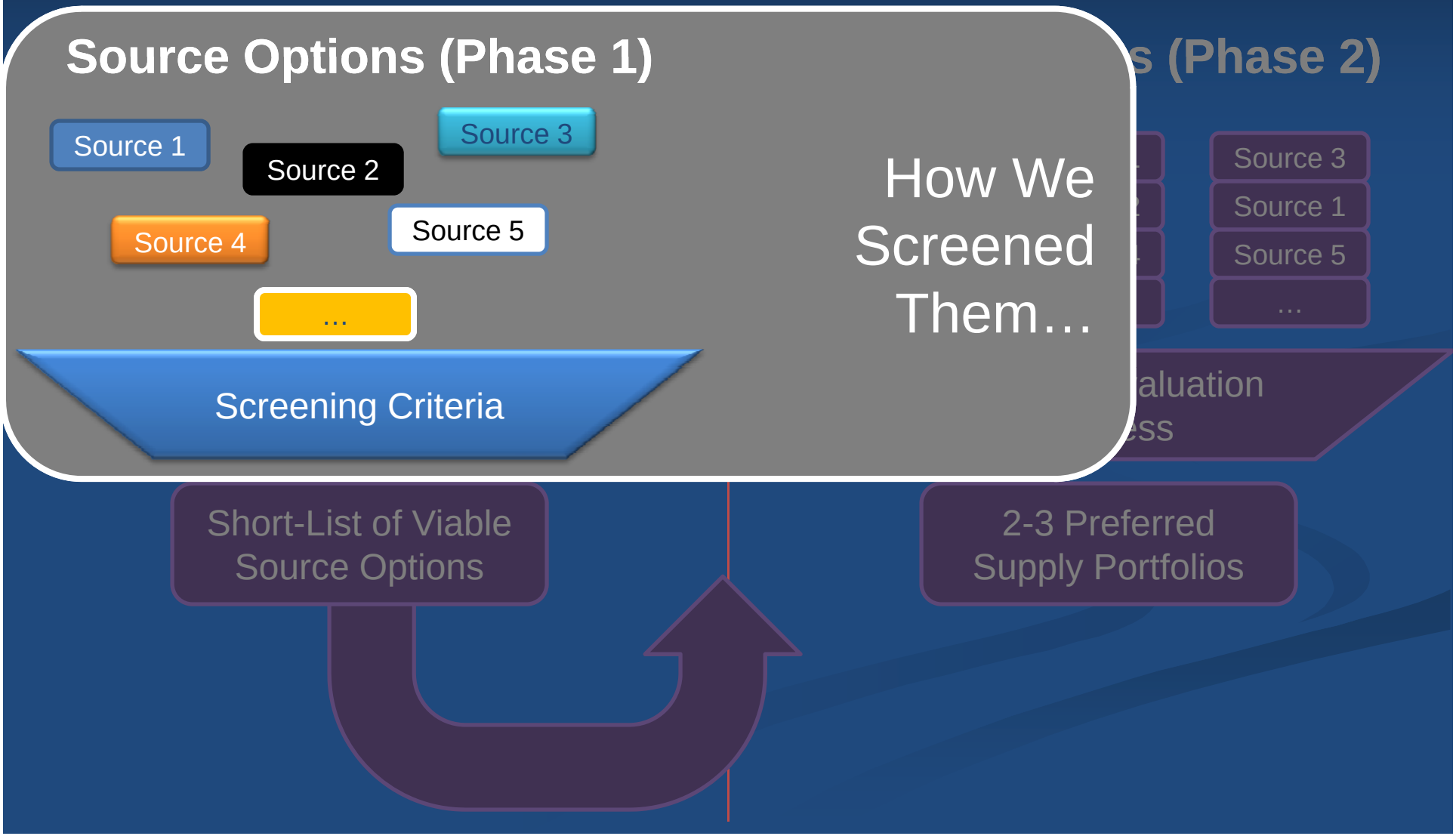


New Regional Sources



Firm Yield:
Co-owner with OKC – full 2060 demand
Scissortail – firm yield of 20 mgd (68% of 2060 demand)
Parker – full 2060 demand
Kaw – full 2060 demand

Review of Supply Sources and Evaluation Criteria (continued)



Relative Comparison of Individual Source Options

SUPPLY AVAILABILITY

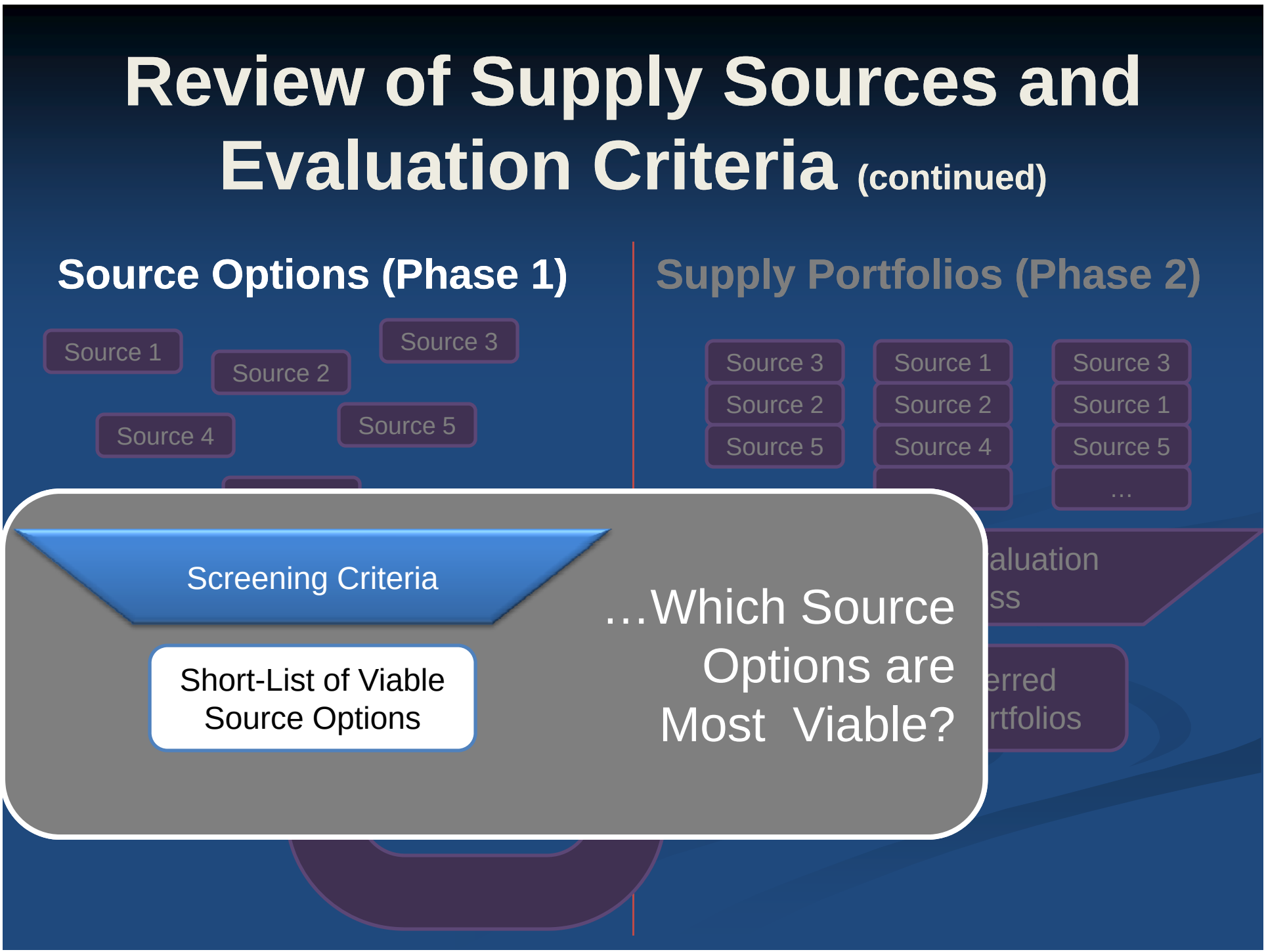
RELIABILITY

CERTAINTY & TIMELINESS

COST-EFFECTIVENESS

- Quantitative (supply avail. & cost)
- Qualitative (reliability & certainty)
  - Scored from 1 (worst) to 5 (best)

Review of Supply Sources and Evaluation Criteria (continued)



Water Supply Options Selected for Portfolio Development

Existing Sources	New Local Sources	New Regional Sources
Lake Thunderbird (at firm yield)	Additional conservation	Co-owner with OKC for SE Oklahoma treated water
Garber Wellington Aquifer Wells (with treatment)	Direct non-potable reuse (purple pipe)	Co-owner with OKC for SE Oklahoma raw water
Intermittent purchase of treated water from OKC (wholesale)	Indirect potable reuse (Lake Thunderbird augmentation)	New out of basin reservoir (either Scissortail or Parker)
Conservation and reuse	~~Indirect potable reuse (groundwater recharge)~~	Kaw Lake
	~~Dredging Lake Thunderbird~~	

The most viable and cost-effective supply options became the "building blocks" for water supply portfolios

AGENDA

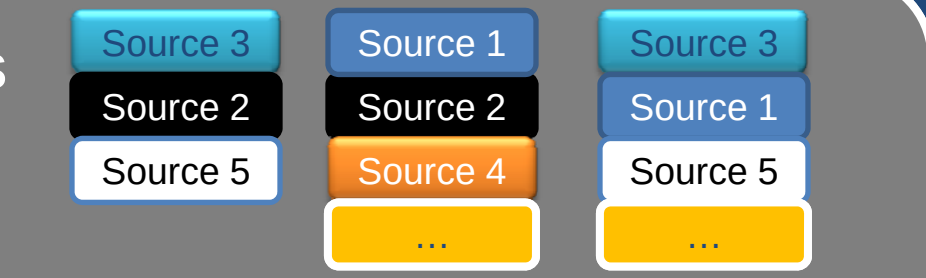
- Project overview and update on progress
- Quick review of supply options
- Portfolio evaluations
- Feedback and discussion on supply portfolios

In Tonight's Meeting We Will…

Source Options (Phase 1)

Supply Portfolios (Phase 2)

Describe portfolios and present preliminary results of portfolio evaluations

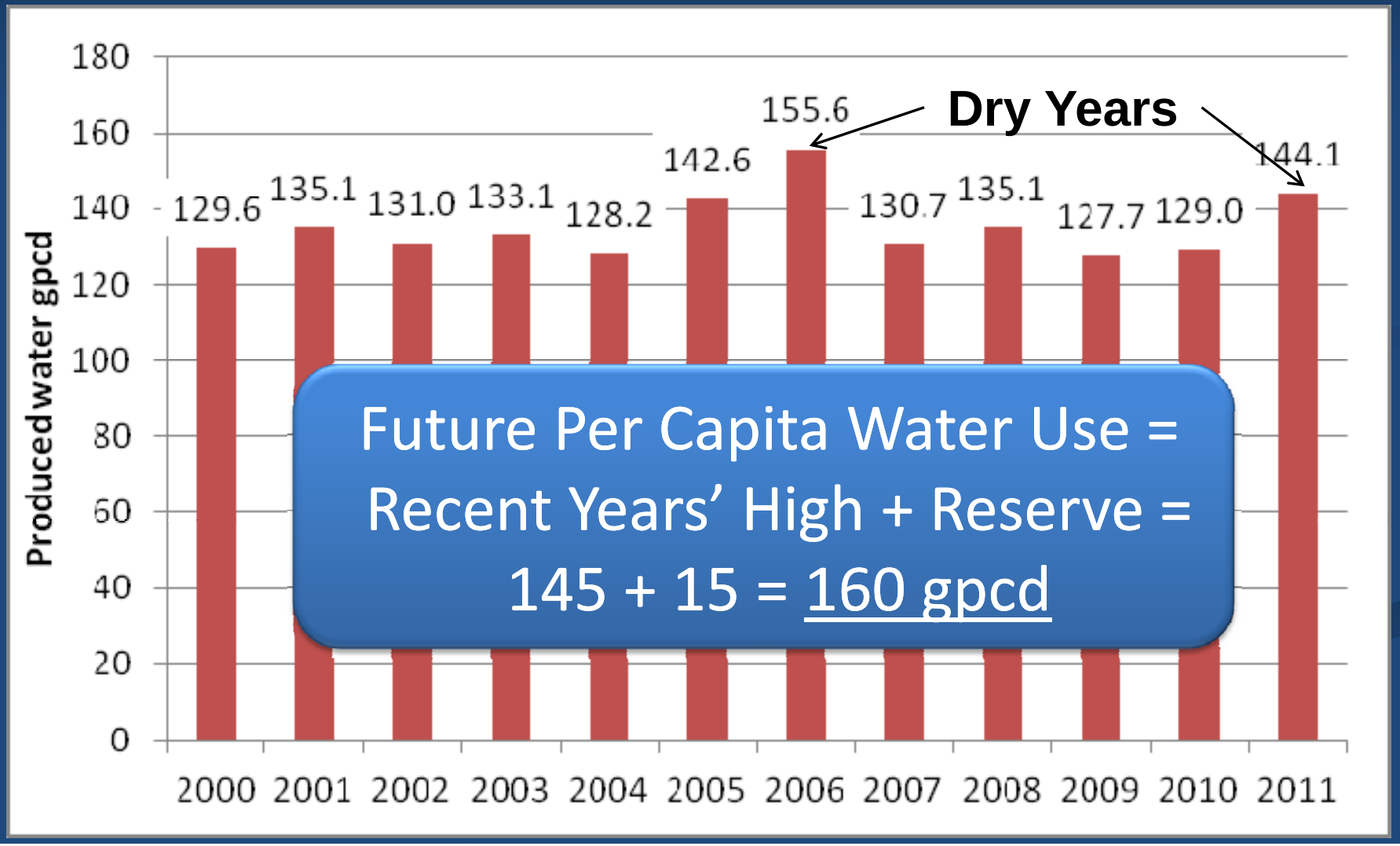


Source 3
Source 1
Source 5
…

ation

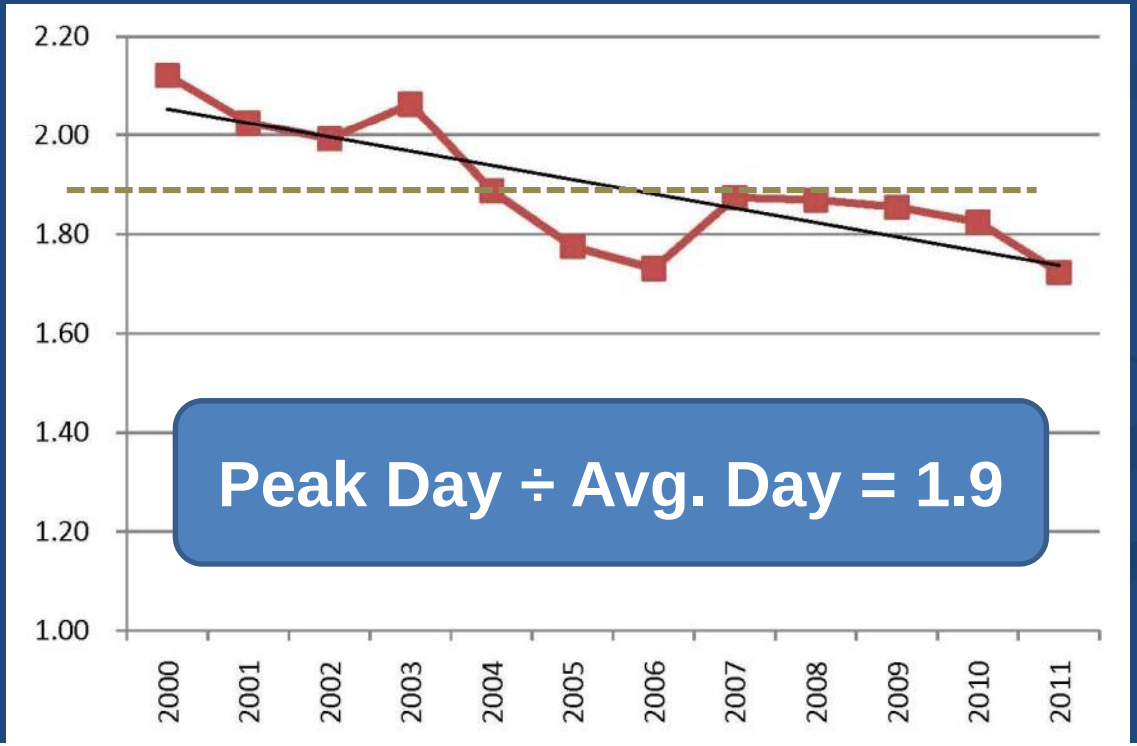
2-3 Preferred Supply Portfolios

Historical Per-Capita Water Use in Norman

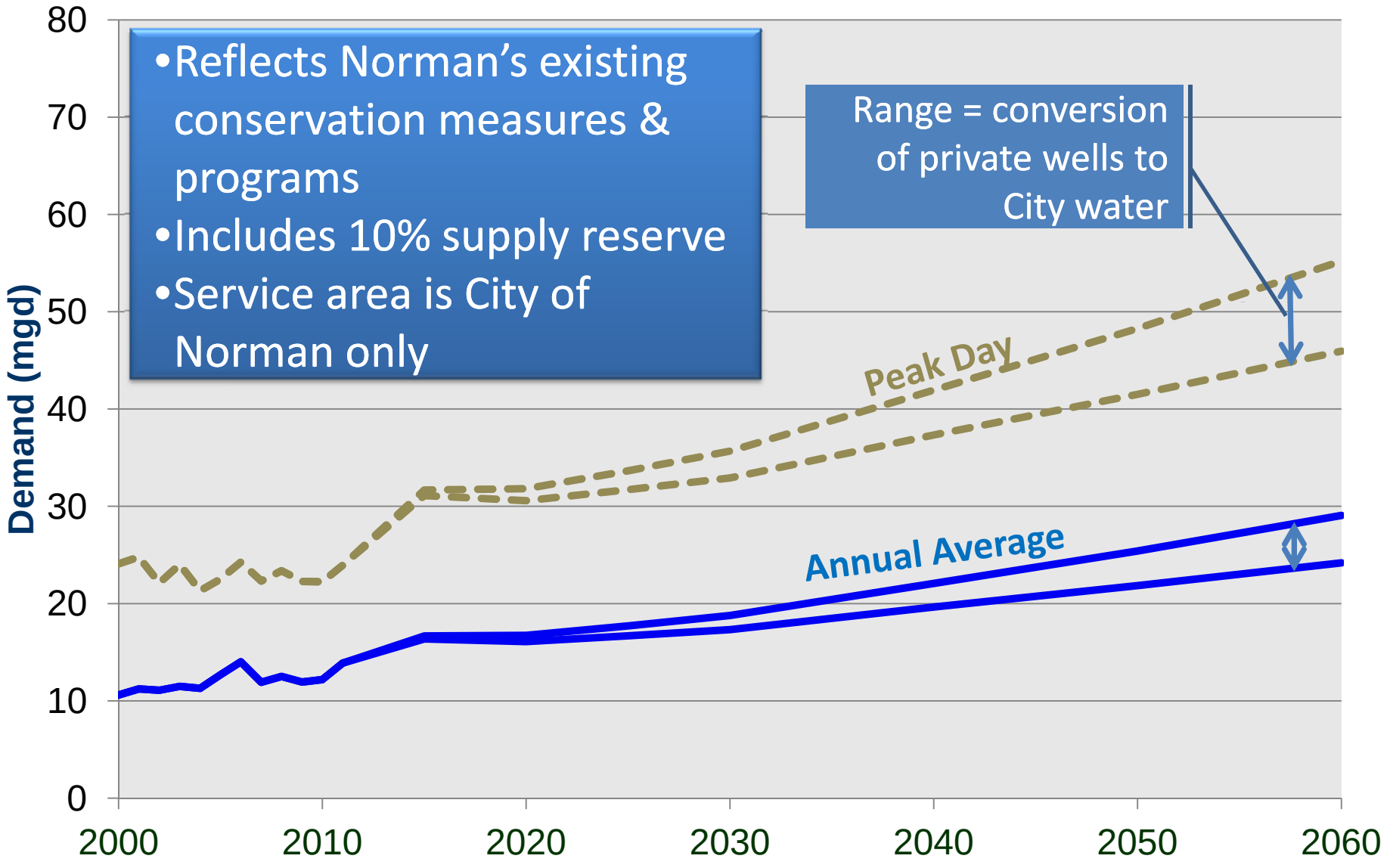


Historical Daily Peaking Factors

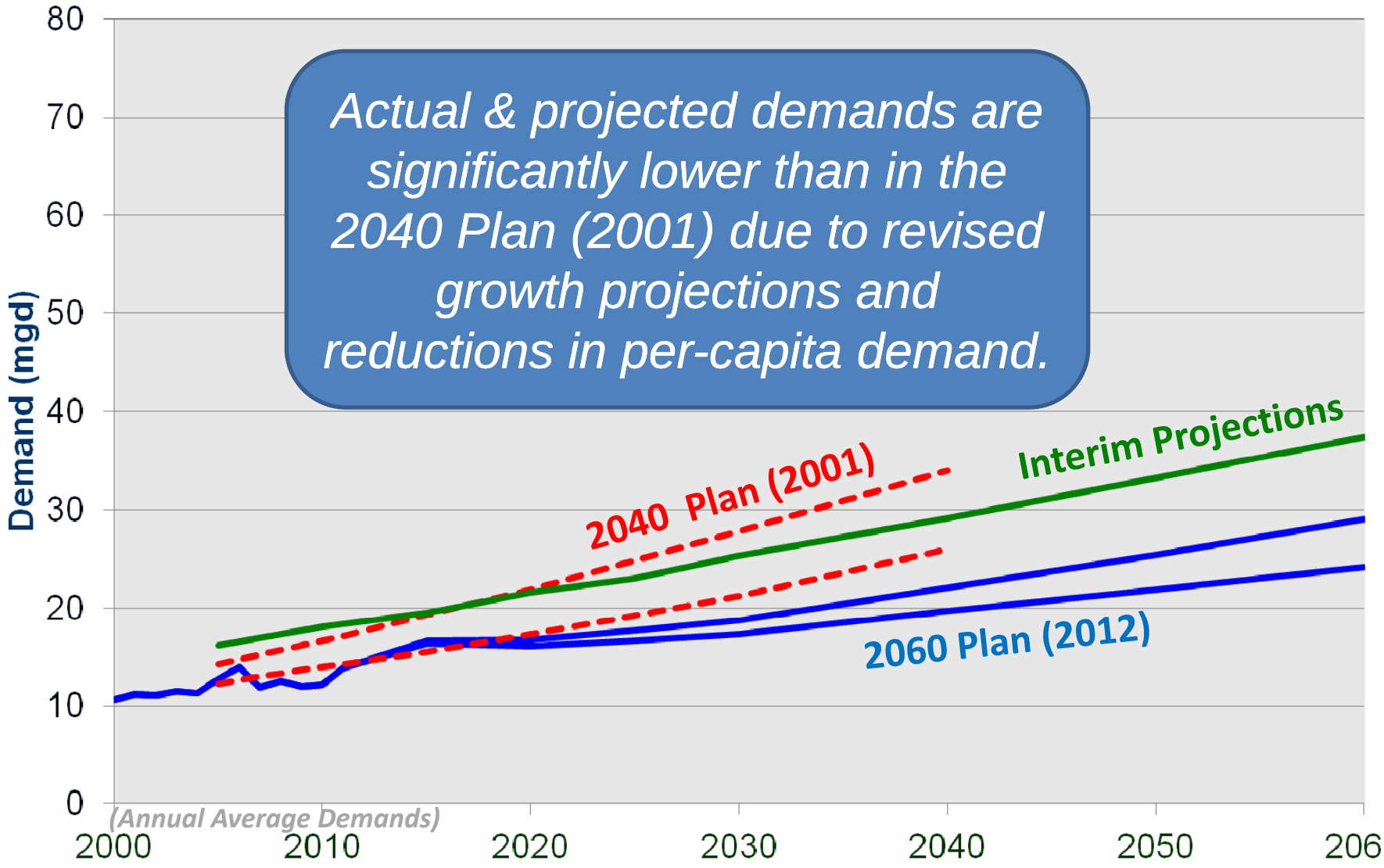
- Decreasing trend due to:
  - Reuse & non-potable conversion projects
  - Conservation measures



Projected Water Use



Projected Water Use



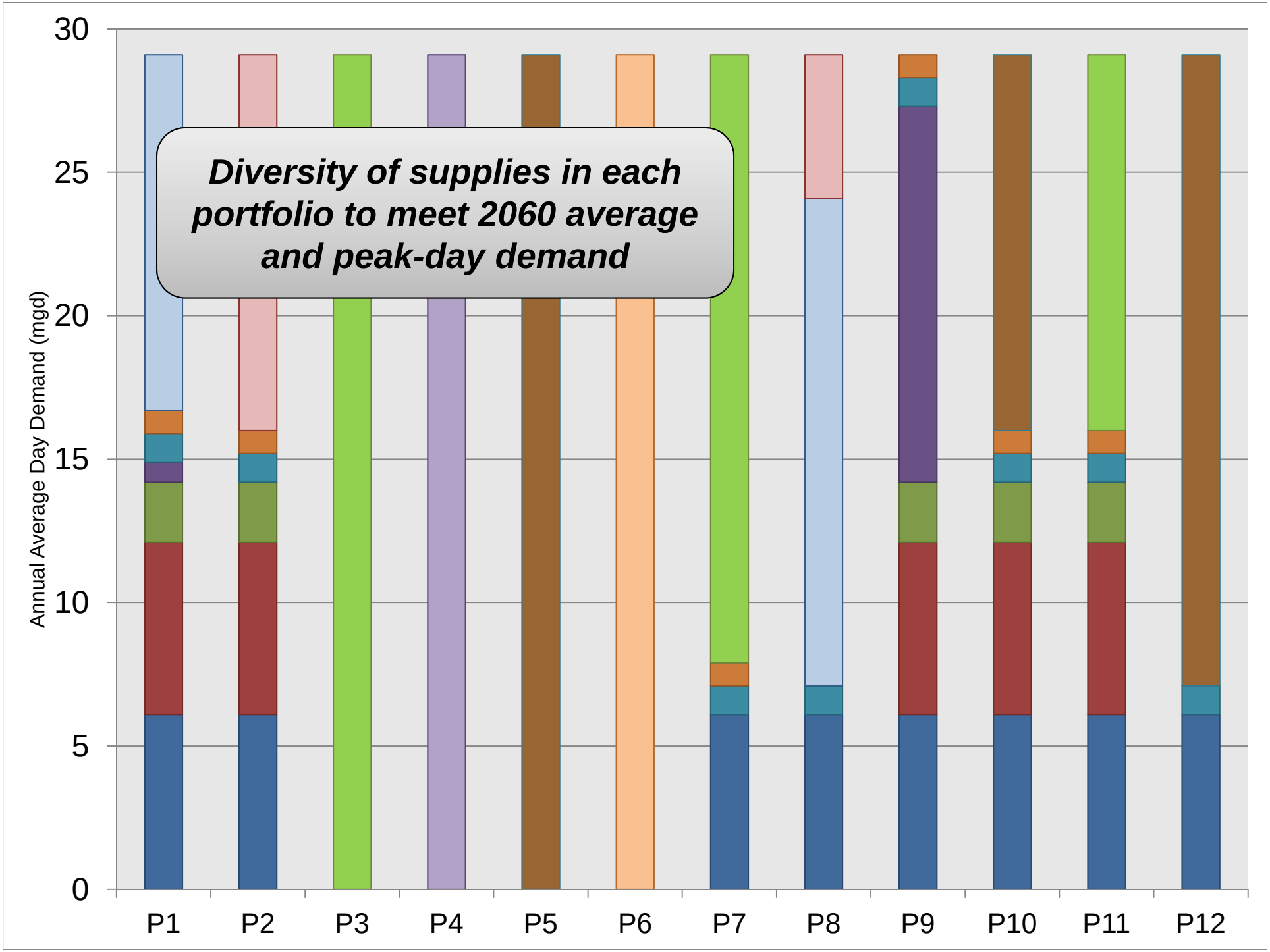
Portfolio	Supply Sources
P1 – Maximize local sources	▪ Lake Thunderbird at firm yield (6.1 mgd) ▪ Existing wells treated for chromium-6 & arsenic (8.1 mgd) ▪ Additional conservation + non-potable reuse (1 mgd + 0.8 mgd) ▪ New GW wells to meet deficit through ~2020 (0.7 mgd) ▪ IPR – Thunderbird augmentation post-2020 (12.4 mgd)
P2 – Minimize capital cost	▪ Lake Thunderbird at firm yield (6.1 mgd) ▪ Existing wells treated for chromium-6 & arsenic (8.1 mgd) ▪ Additional conservation + non-potable reuse (1.8 mgd) ▪ Purchase treated water from OKC (wholesale) (13.1 mgd)
P3 – Regional option with OKC treated water	▪ Co-owner with OKC for treated water (29.1 mgd)
P4 – Regional option with OKC treated water	▪ Co-owner with OKC for raw water (29.1 mgd)
P5 – Regional option with new reservoir	▪ New out of basin reservoir (29.1 mgd)
P6 – Regional option with Kaw	▪ Kaw Lake (29.1 mgd)

Portfolio	Supply Sources
P7 – Hybrid portfolio with OKC treated water	▪ Additional conservation + non-potable reuse (1.8 mgd) ▪ Co-owner with OKC for treated water (21.2 mgd)
P8 – Hybrid portfolio with IPR	▪ Additional conservation (1 mgd) ▪ IPR – Thunderbird augmentation (17 mgd) ▪ Purchase treated water from OKC (wholesale) (5 mgd)
P9 – Hybrid portfolio max. groundwater	▪ Additional conservation + non-potable reuse (1.8 mgd) ▪ Existing wells treated for chromium-6 & arsenic (8.1 mgd) ▪ New GW wells (with treatment) to meet 2060 deficit (13.1 mgd)
P10 – Hybrid portfolio with Parker	▪ Existing wells treated for chromium-6 & arsenic (8.1 mgd) ▪ Additional conservation + non-potable reuse (1.8 mgd) ▪ Parker Reservoir to meet 2060 deficit (13.1 mgd)
P11 – Hybrid portfolio with OKC treated water	▪ Existing wells treated for chromium-6 & arsenic (8.1 mgd) ▪ Additional conservation + non-potable reuse (1.8 mgd) ▪ Co-owner with OKC for treated water (13.1 mgd)
P12 – Hybrid portfolio with Scissortail	▪ Additional conservation (1 mgd) ▪ Scissortail Reservoir to meet 2060 deficit (22 mgd)

Lake Thunderbird at firm yield (6.1 mgd)

Portfolio ID	Lake Thunderbird	Active Garber Wellington Wells (with treatment)	Inactive Garber Wellington Wells (with treatment)	New Garber Wellington Wells (with treatment)	Additional Conservation	Direct Non-potable Reuse	Lake Thunderbird Augmentation (IPR)	Treated Water from Oklahoma City (wholesale)	Treated Water from Oklahoma City (co-owner)	Raw Water from Oklahoma City (co-owner)	New Out of Basin Reservoir (Parker or Scissortail)	Kaw Lake
P1	6.1	6.0	2.1	0.7	1.0	0.8	12.4					
P2	6.1	6.0	2.1		1.0	0.8		13.1				
P3									29.1			
P4										29.1		
P5											29.1	
P6												29.1
P7	6.1				1.0	0.8			21.2			
P8	6.1				1.0		17.0	5.0				
P9	6.1	6.0	2.1	13.1	1.0	0.8						
P10	6.1	6.0	2.1		1.0	0.8					13.1	
P11	6.1	6.0	2.1		1.0	0.8			13.1			
P12	6.1				1.0						22.0	

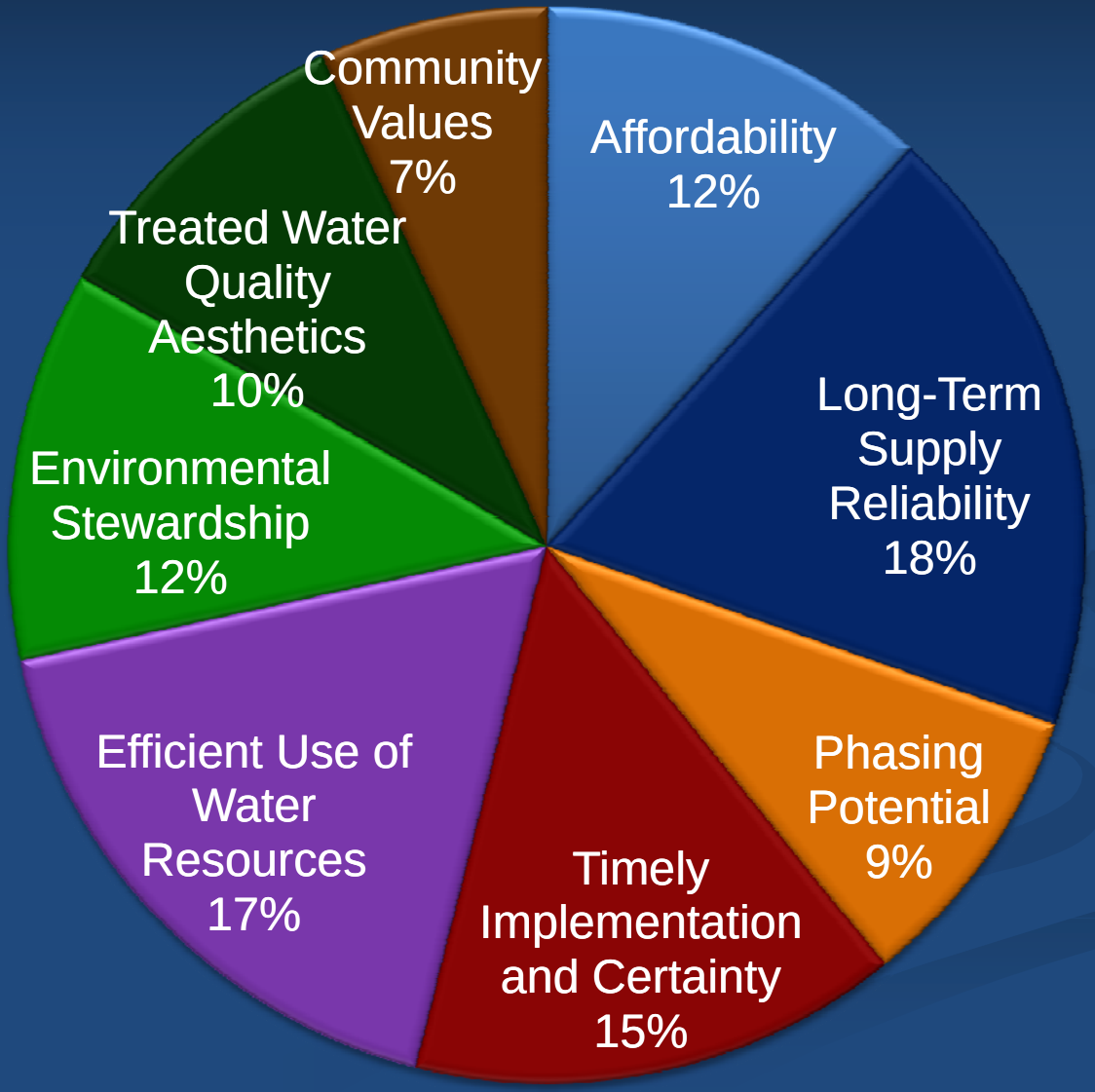
Annual Average Day Demand (mgd)


Diversity of supplies in each portfolio to meet 2060 average and peak-day demand
Annual Average Day Demand (mgd)
30
25
20
15
10
5
0
P1
P2
P3
P4
P5
P6
P7
P8
P9
P10
P11
P12

Criteria for Detailed Evaluations

- Affordability
- Long-Term Supply Reliability
- Phasing Potential
- Timely Implementation and Certainty
- Efficient Use of Water Resources
- Environmental Stewardship
- Treated Water Quality Aesthetics
- Community Values (Recreation, Aesthetics, and Property Rights)

Criteria and Their Relative Importance or "Weight" in Comparing Portfolios



Portfolio Scoring Process

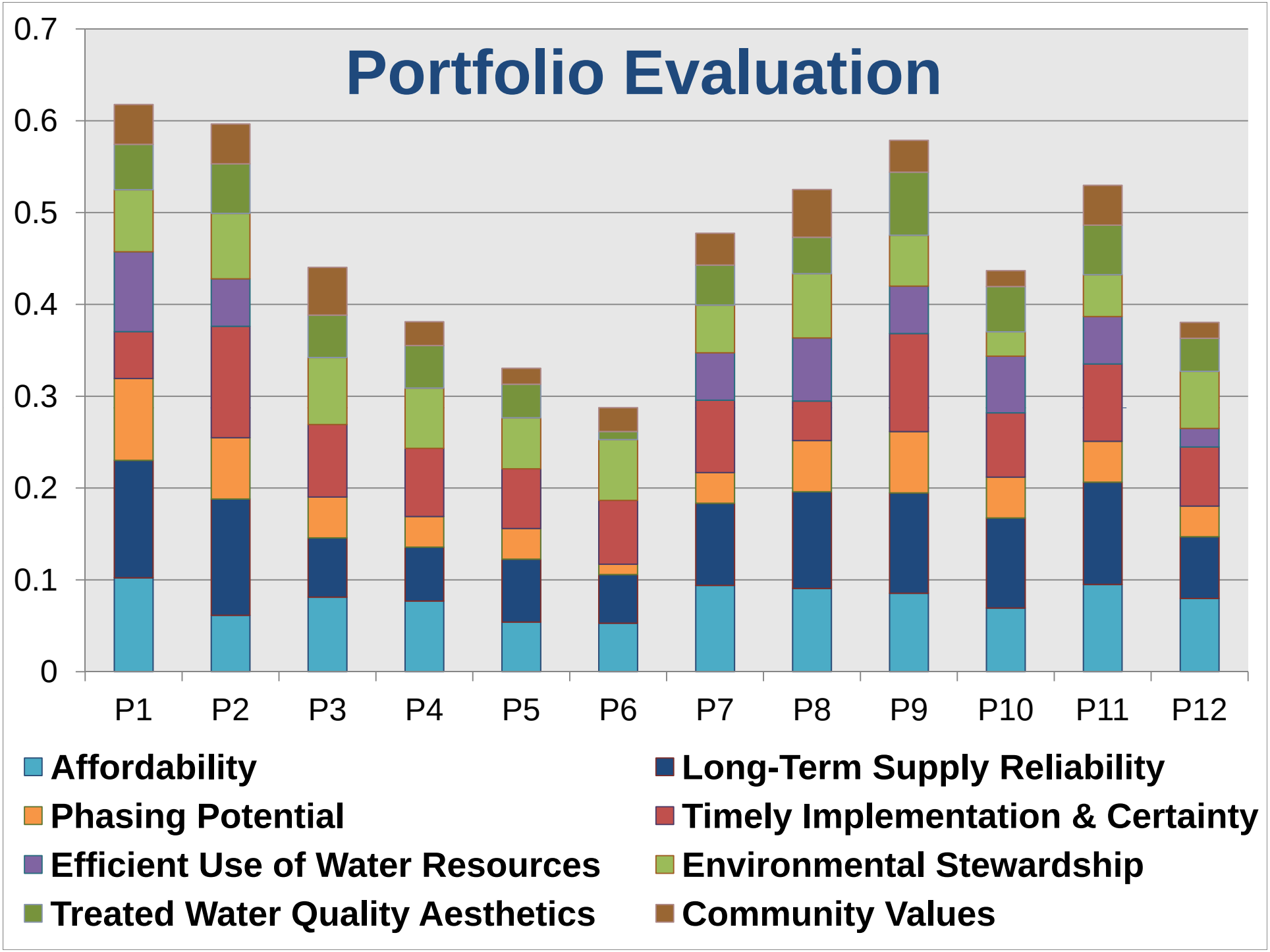
Raw score (Reliability) x  = Partial Portfolio Score

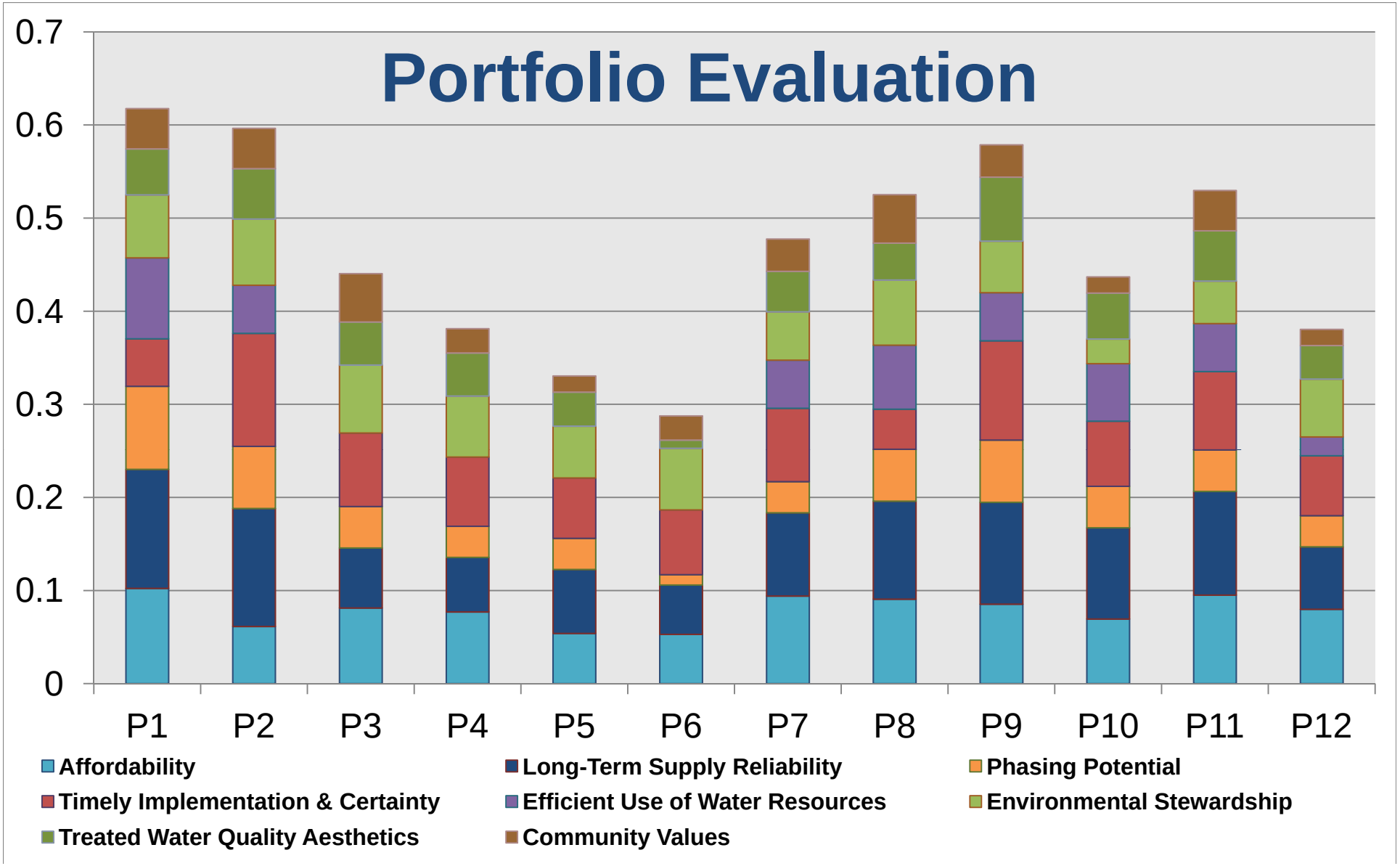
Raw score (Phasing) x  = Partial Portfolio Score

Raw score (Timely) x  = Partial Portfolio Score

… repeat for remaining criteria

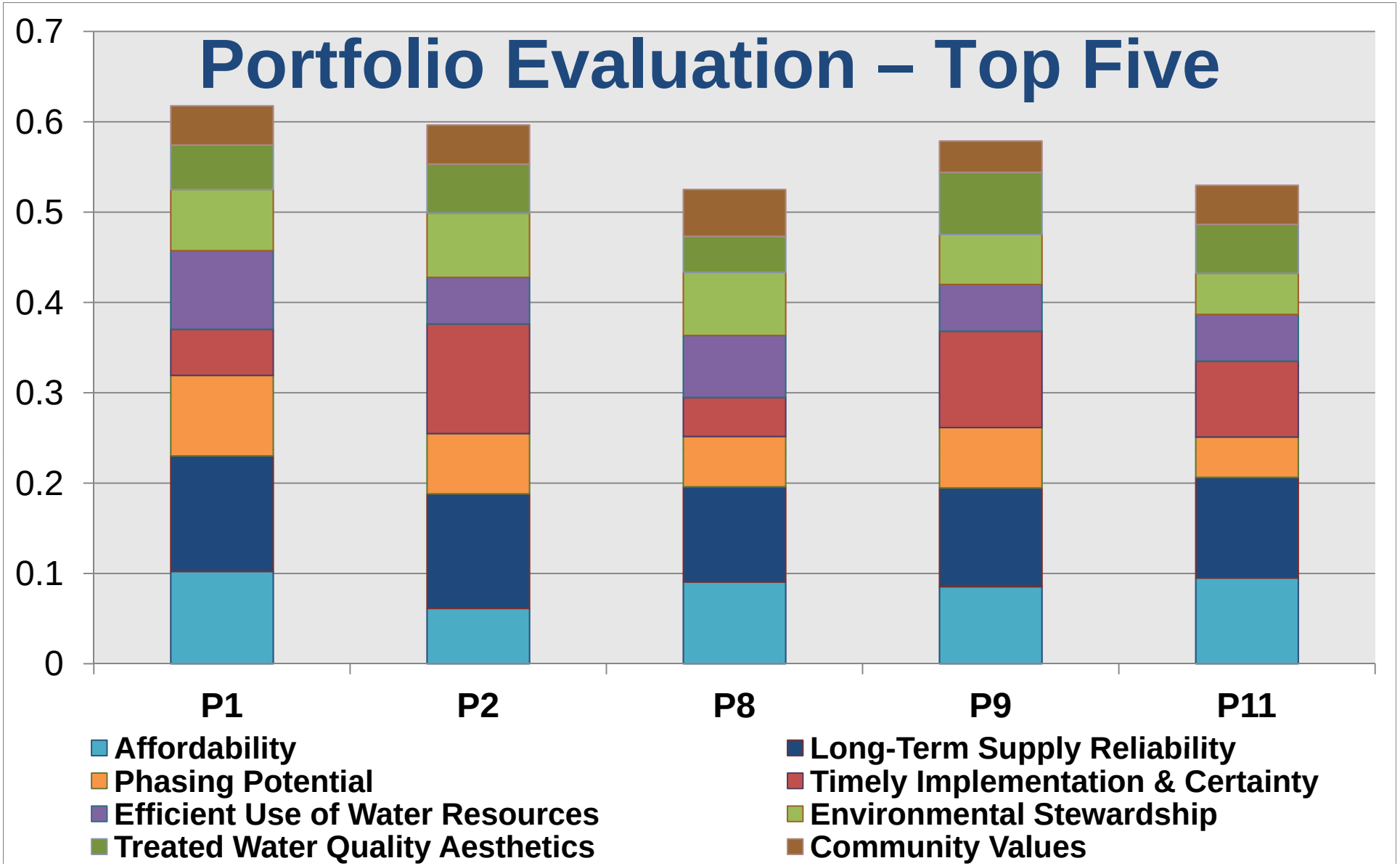
… repeat for remaining portfolios


Portfolio Evaluation
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
P1
P2
P3
P4
P5
P6
P7
P8
P9
P10
P11
P12
Affordability
Long-Term Supply Reliability
Phasing Potential
Timely Implementation & Certainty
Efficient Use of Water Resources
Environmental Stewardship
Treated Water Quality Aesthetics
Community Values



2012$	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
Capital	$260M	$140M	$410M	$440M	$620M	$620M	$320M	$180M	$360M	$490M	$300M	$440M
O&M per year	$21M	$53M	$24M	$24M	$26M	$26M	$22M	$34M	$26M	$25M	$22M	$22M

Portfolio Evaluation – Top Five



2012$	P1	P2	P8	P9	P11
Capital	$260M	$140M	$180M	$360M	$300M
O&M per year	$21M	$53M	$34M	$26M	$22M

Portfolio Evaluation – Top Five

Portfolio	Supply Sources	Costs (2012$)
P1 – Maximize local sources	▪ Lake Thunderbird at firm yield (6.1 mgd) ▪ Existing wells treated for chromium-6 & arsenic (8.1 mgd) ▪ Additional conservation + non-potable reuse (1 mgd + 0.8 mgd) ▪ New GW wells to meet deficit through ~2020 (0.7 mgd) ▪ IPR – Thunderbird augmentation post-2020 (12.4 mgd)	Capital $260M O&M $21M/yr
P2 – Minimize capital cost	▪ Lake Thunderbird at firm yield (6.1 mgd) ▪ Existing wells treated for chromium-6 & arsenic (8.1 mgd) ▪ Additional conservation + non-potable reuse (1.8 mgd) ▪ Purchase treated water from OKC (wholesale) (13.1 mgd)	Capital $140M O&M $53M/yr
P8 – Hybrid portfolio with IPR	▪ Lake Thunderbird at firm yield (6.1 mgd) ▪ Additional conservation (1 mgd) ▪ IPR – Thunderbird augmentation (17 mgd) ▪ Purchase treated water from OKC (wholesale) (5 mgd)	Capital $180M O&M $34M/yr
P9 – Hybrid portfolio max. groundwater	▪ Lake Thunderbird at firm yield (6.1 mgd) ▪ Additional conservation + non-potable reuse (1.8 mgd) ▪ Existing wells treated for chromium-6 & arsenic (8.1 mgd) ▪ New GW wells (with treatment) to meet 2060 deficit (13.1 mgd)	Capital $360M O&M $26M/yr
P11 – Hybrid portfolio with OKC treated water	▪ Lake Thunderbird at firm yield (6.1 mgd) ▪ Existing wells treated for chromium-6 & arsenic (8.1 mgd) ▪ Additional conservation + non-potable reuse (1.8 mgd) ▪ Co-owner with OKC for treated water (13.1 mgd)	Capital $300M O&M $22M/yr

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Water Supply Portfolios

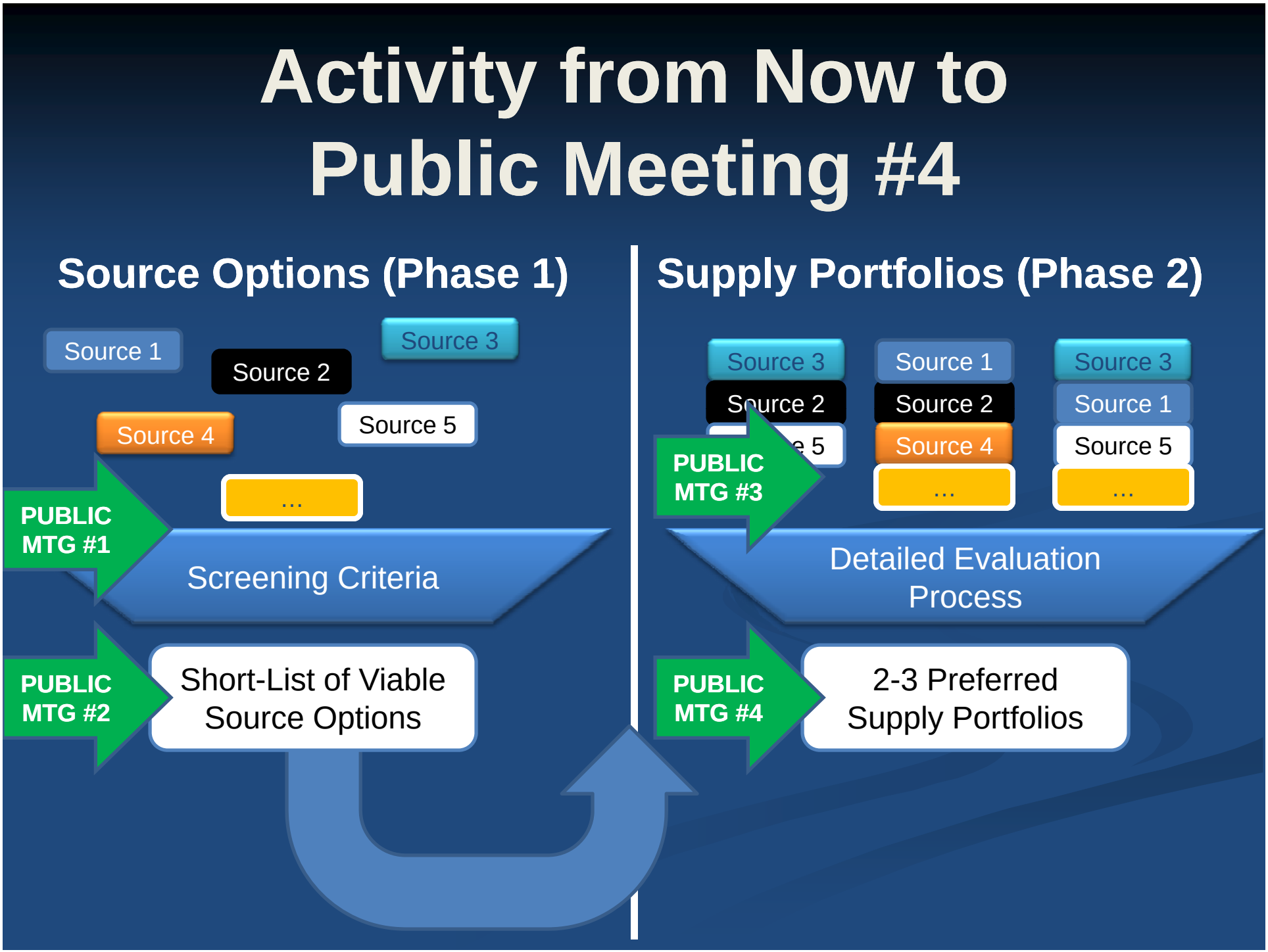
Feedback?

Different portfolios we should evaluate?

Portfolio Feedback

- **P1 – Maximize local sources**
- **P2 – Minimize capital cost**
- P3 – Regional option with OKC treated water
- P4 – Regional option with OKC raw water
- P5 – Regional option with new out of basin reservoir
- P6 – Regional option with Kaw
- P7 – Hybrid portfolio with OKC treated water
- **P8 – Hybrid portfolio with IPR (Thunderbird augmentation)**
- **P9 – Hybrid portfolio maximizing groundwater**
- P10 – Hybrid portfolio with Parker
- **P11 – Hybrid portfolio with OKC treated water**
- P12 – Hybrid portfolio with Scissortail

Activity from Now to Public Meeting #4



Norman Utilities Authority

2060 Strategic Water Supply Plan

Public Meeting #3

March 13, 2013