

SRBA BOARD WORKSHOP

DECEMBER 16, 2014

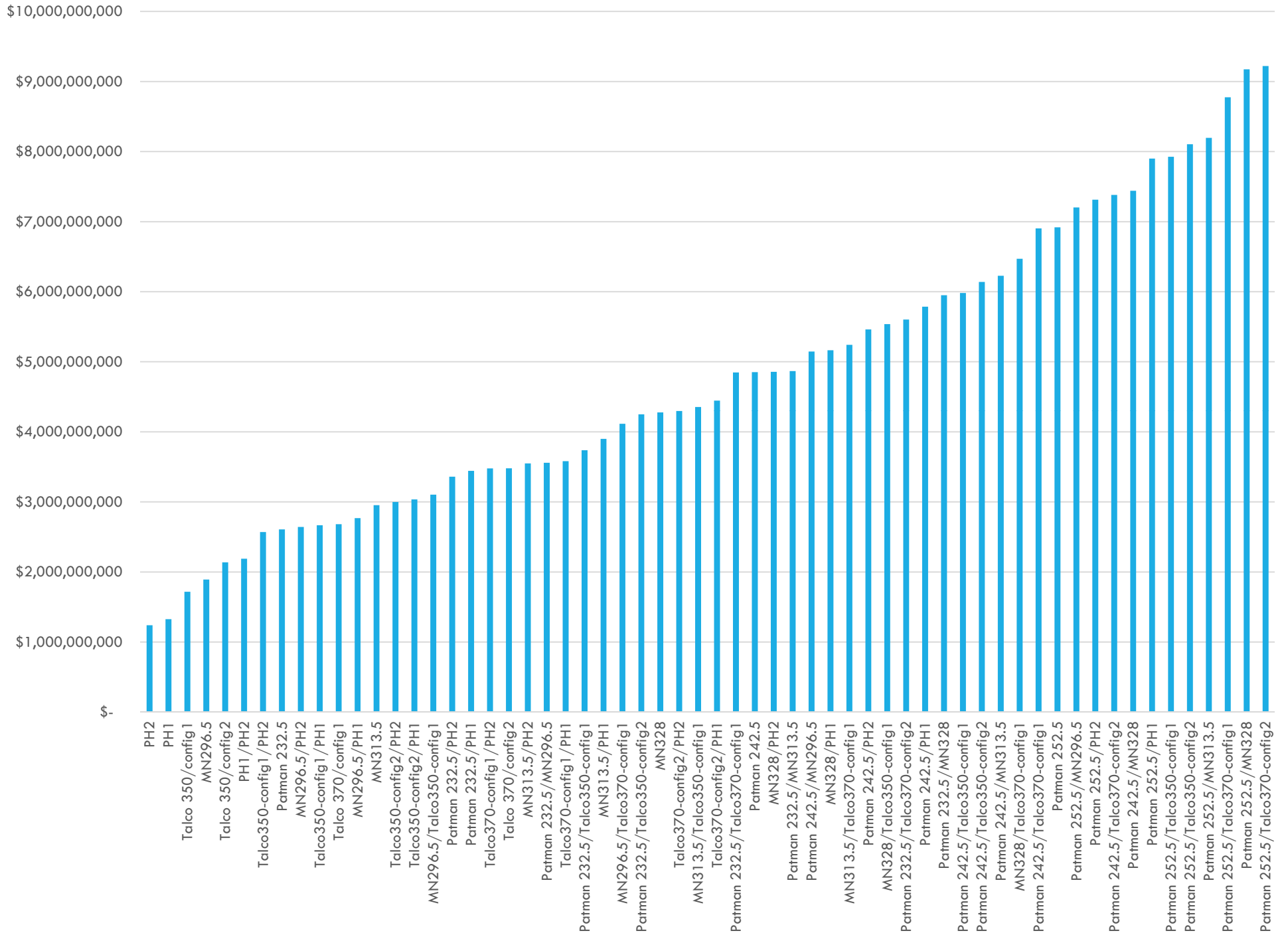


COST ANALYSIS

CAPITAL COSTS

Reservoir Component

- Dam and Spillway
 - Land
 - Conflicts (roads, bridges, utilities, etc.)
 - Mitigation (environmental and cultural)
 - Permitting
 - Interest During Construction
-
- Transmission Component
 - Pipeline(s)
 - Pumpstation(s)
 - Interest During Construction
-
- Total Capital Cost



ANNUAL COSTS

Debt Service on Capital Costs

- Per TWDB Guidelines (5.5% interest over 40 years)

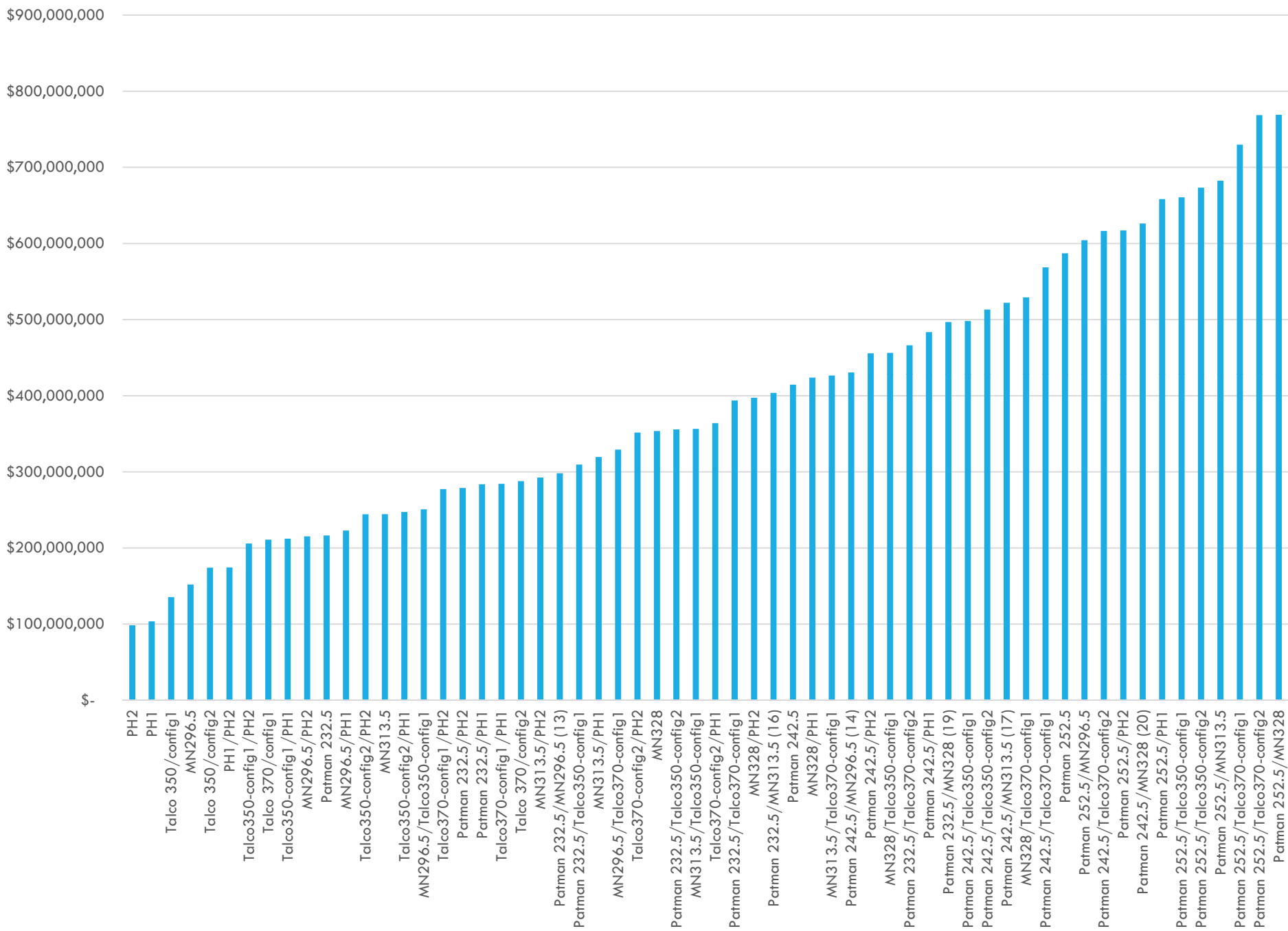
Operations and Maintenance Costs

- Reservoir/Embankment/Spillwy
- Pipelines and Pumpstations
- Programmed replacements

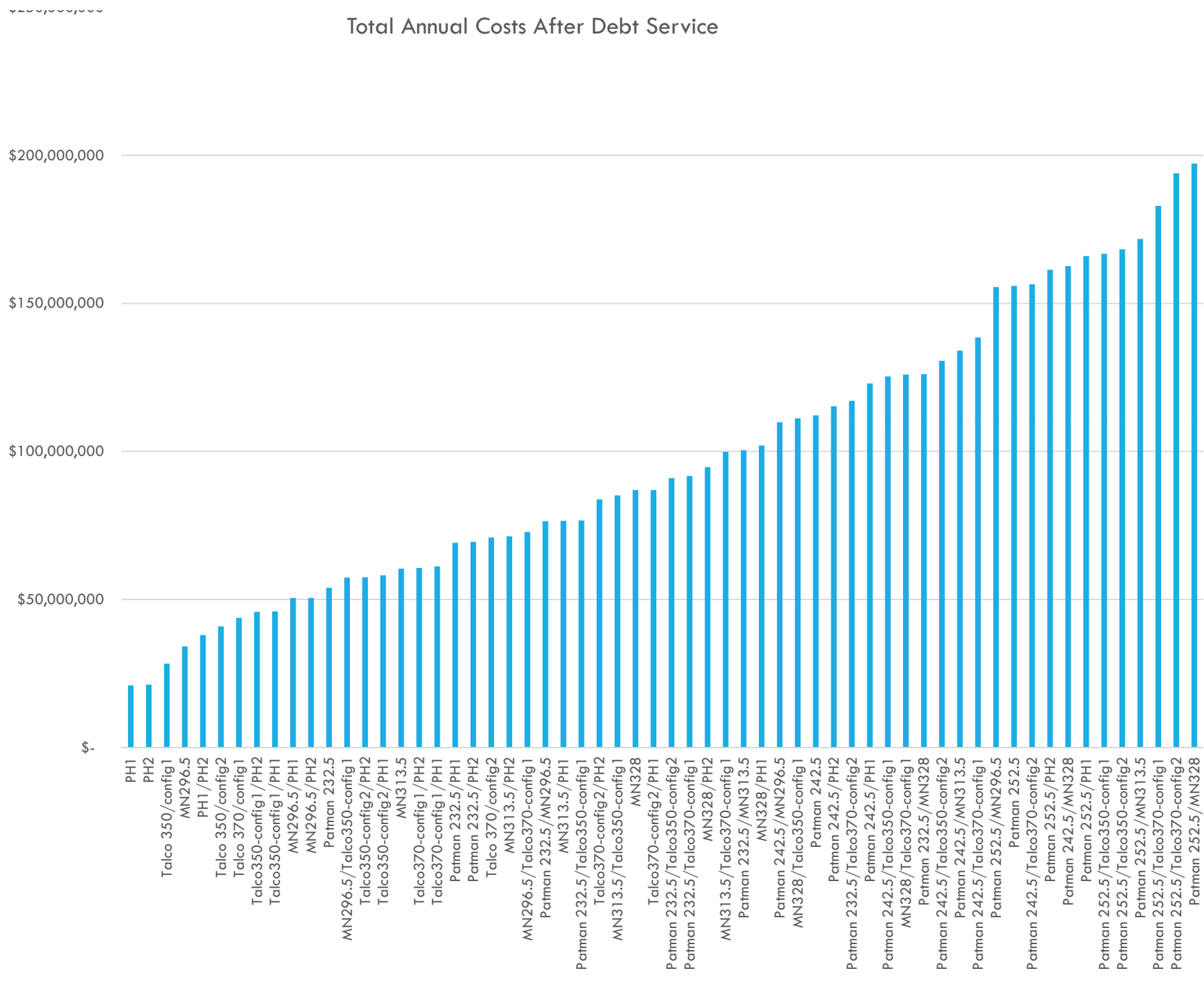
Pumping

- Electricity costs @\$.07/kilowatt hour for all alternatives
- Varies by amount of water pumped, distance, and hydraulic grade

Total Annual Costs During Debt Service



Total Annual Costs After Debt Service



UNIT COSTS

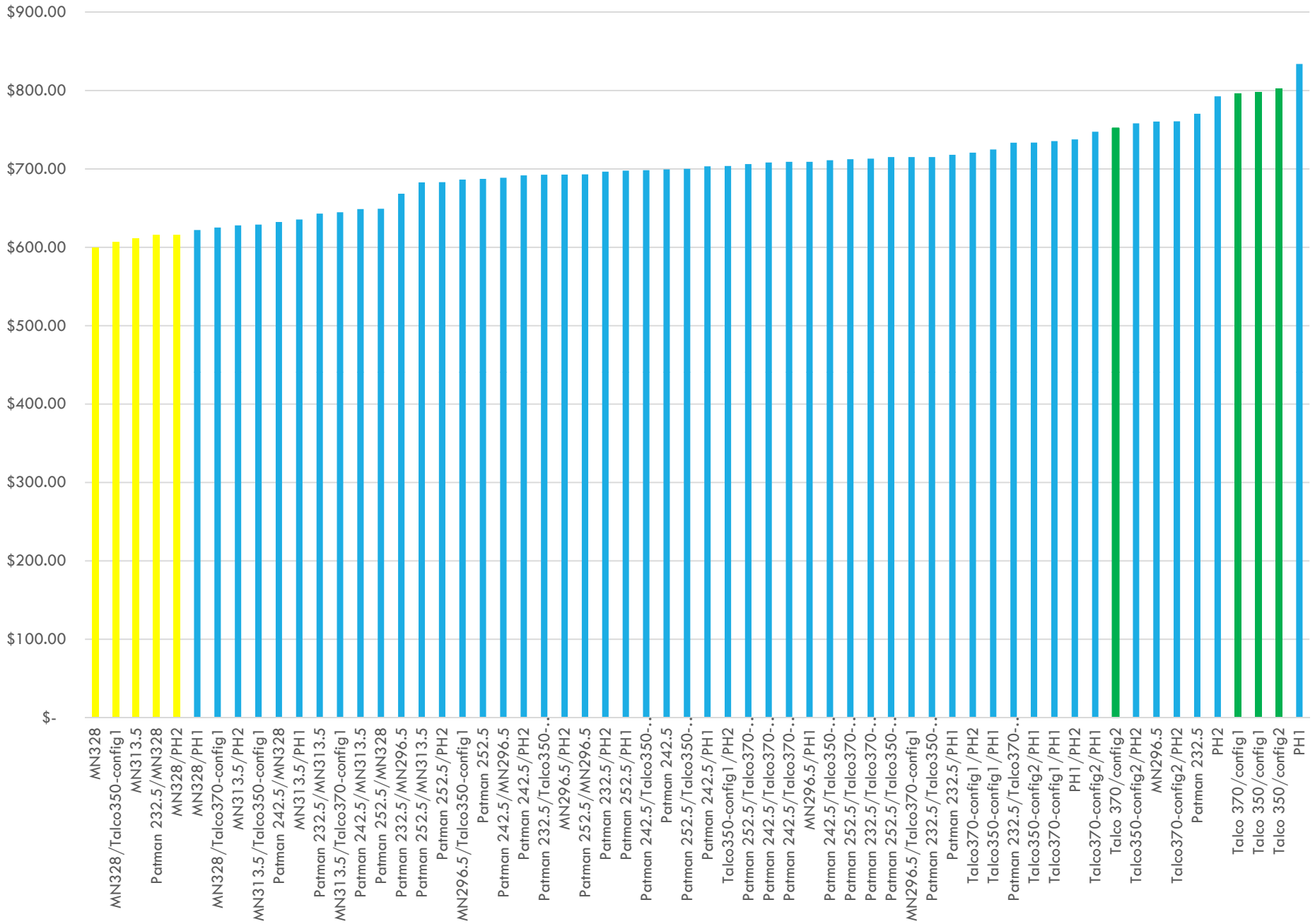
Annual cost divided by annual yield

Expressed as \$ per acre-foot

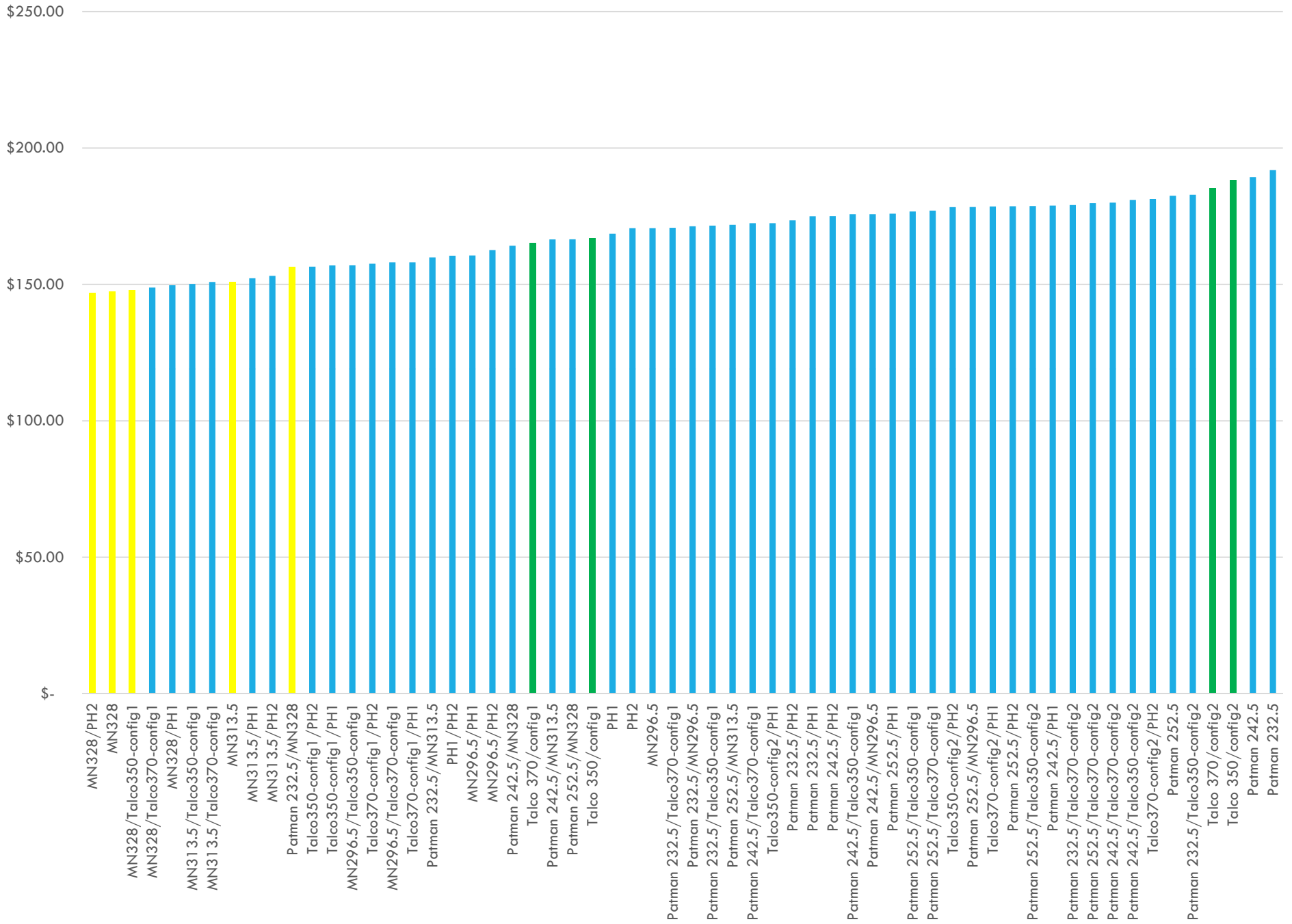
Two scenarios

- During Debt Service
- After Debt Service

Unit Costs based on 100% Yield During Debt Service



Unit Costs based on 100% Yield After Debt Service



COMPARISON — CHEAPEST UNIT COST ALTERNATIVES

During Debt Service

1. MN 328
2. MN 328/Talco 350 (1)
3. MN 313
4. MN 328/Patman 232.5
5. MN 328/PH2

After Debt Service

1. MN 328/PH2
2. MN 328
3. MN 328/Talco 350 (1)
4. MN 328/Talco 370 (1)
5. MN 328/PH1

COMPARISON – TALCO CONFIGURATIONS

AVERAGE COST ANALYSIS

During Debt Service

Unit Cost per Acre-Foot of Yield:

Talco 350 (1): \$798.16

Talco 350 (2): \$802.14

Talco 370 (1): **\$795.86**

Talco 370 (2): **\$751.91**

After Debt Service

Unit Cost per Per Acre-Foot of Yield:

Talco 350 (1): \$166.98

Talco 350 (2): \$188.38

Talco 370 (1): \$165.18

Talco 370 (2): \$185.33

COMPARISON – TALCO CONFIGURATIONS

MARGINAL COST ANALYSIS

Talco 350

Configuration 1 Yield: 169,600 af/yr

Configuration 2 Yield: 217,100

Difference: 47,500 af/yr

Configuration 1 Cost: \$1,717,617,000

Configuration 2 Cost: \$2,137,991,000

Difference: \$420,374,000

Cost/Acre-foot: \$8,849.97

Comparison with highest Average Unit
Cost: **10.6x**

Talco 370

Configuration 1 Yield: 265,100 af/yr

Configuration 2 Yield: 382,800 af/yr

Difference: 117,700 af/yr

Configuration 1 Cost: \$2,682,664,000

Configuration 2 Cost: \$3,480,067,000

Difference: \$797,402,957

Cost/Acre-foot: \$6,774.88

Comparison with highest Average Unit
Cost: **8.1x**



OTHER DISCUSSION |

TARGET YIELD — JUSTIFIED NEED

Metroplex JCPD Members:	584,000 af/yr
Estimated need — Sulphur Basin*	20,000 af/yr
Total (net of environmental flow reqmts)	604,000 af/yr

*Assumes Corps/Texarkana have implemented the permanent storage contract for Wright Patman

ENVIRONMENTAL FLOW CONSIDERATIONS

-Uncertainty as to whether Senate Bill 3 processes would apply to Sulphur Basin at time of any permit application

-Lyons method disproportionately effects Wright Patman

-Other general uncertainty

- Drought of record
- Climate change



Err on the side of larger rather than smaller (600-700k af/yr)

SIGNIFICANCE OF YIELD TARGET

Only stand-alone alternative in the target range is the large Wright Patman reallocations.

- Among the most expensive on a unit cost basis
- Disproportionally greater environmental impacts
- Progressively greater dam safety and downstream concerns

WRIGHT PATMAN ANALYSIS

Reservoir	Yield (100%)	% Change	Reservoir Cost (Millions)	% Change	Waters of the US (acres)	% Change	% WOCMA
WP 232.5	281,000	--	\$ 335.8	--	12,525	--	4%
WP 242.5	592,663	111%	\$ 736.7	119%	18,836	50%	21%
WP 252.5	854,400	44%	\$ 1,354.4	84%	32,097	70%	58%

SIGNIFICANCE OF YIELD TARGET

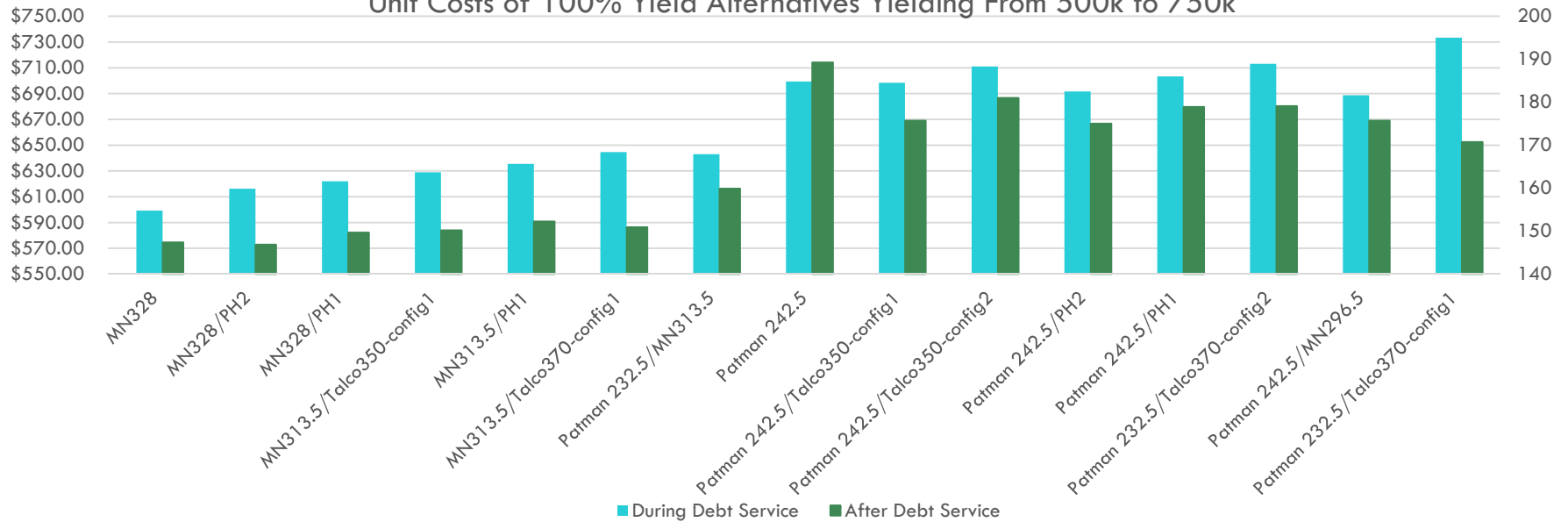
Only stand-alone alternatives in the target range are the large Wright Patman reallocations.

- Among the most expensive on a unit cost basis
- Disproportionally greater environmental impacts
- Progressively greater dam safety and downstream concerns



A combination alternative is suggested

Unit Costs of 100% Yield Alternatives Yielding From 500k to 750k



Alternative ID	Alternative Description	YIELD ac-ft/yr	Per Acre-ft	
			During Debt Service	After Debt Service
6	MN328	590,000	\$599.25	\$147.40
51	MN328/PH2	644,960	\$616.17	\$146.87
48	MN328/PH1	681,410	\$621.97	\$149.68
41	MN313.5/Talco350-config1	566,820	\$628.92	\$150.19
47	MN313.5/PH1	502,890	\$635.52	\$152.26
44	MN313.5/Talco370-config1	661,710	\$644.63	\$150.91
16	Patman 232.5/MN313.5	627,950	\$642.99	\$159.89
2	Patman 242.5	592,700	\$699.42	\$189.27
29	Patman 242.5/Talco350-config1	713,240	\$698.42	\$175.71
32	Patman 242.5/Talco350-config2	721,750	\$711.04	\$180.98
26	Patman 242.5/PH2	658,750	\$691.70	\$175.00
23	Patman 242.5/PH1	687,540	\$703.33	\$178.90
37	Patman 232.5/Talco370-config2	653,830	\$713.07	\$179.10
14	Patman 242.5/MN296.5	625,200	\$688.73	\$175.72
34	Patman 232.5/Talco370-config1	536,900	\$733.37	\$170.75

TALCO/MARVIN NICHOLS COMPARISON

Reservoir Combination	Yield (100%) (000 AFY)	Total Cost (Billions)	Unit Cost After Debt Service (AF)	Waters of the US (acres)	Number of Structures
WP 242.5/ Talco 370 (Alt #35)	803	\$6.9	\$172.45	30,034	391
WP 242.5/ MN313.5 (Alt #17)	805	\$6.2	\$166.52	38,912	58



CONCERNS

Wright Patman Reallocation would require Congressional approval

Wright Patman Reallocation requires timely modification to its DSAC status by the Corps

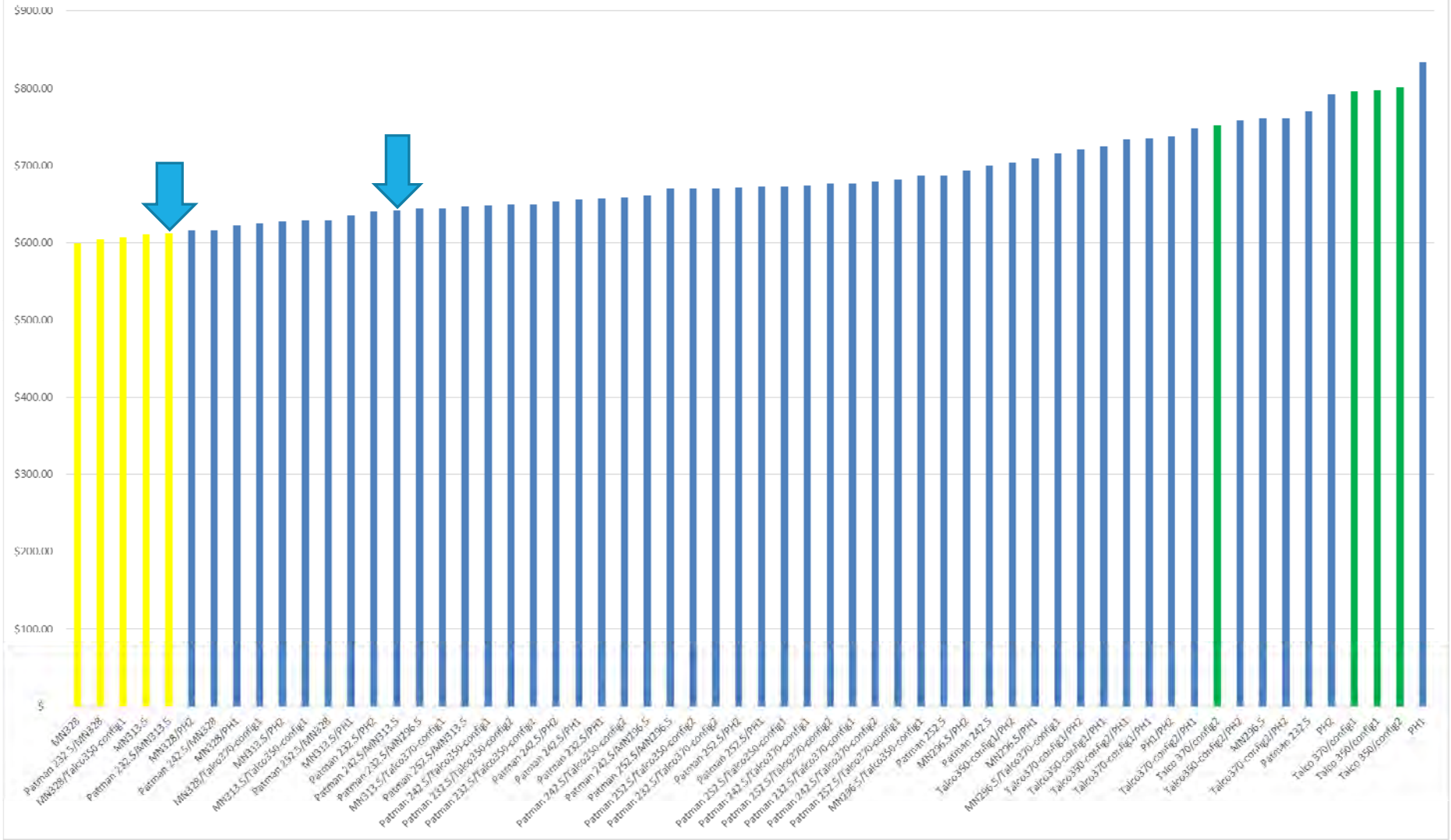
Need to preserve alternative solutions if reallocation strategy proves non-implementable

RECOMMENDATIONS

EXAMPLE RECOMMENDATIONS

- **Alternative #14 (WP 242.5/MN 296.5)**
 - Yield: 625,200
 - Unit Cost after Debt Service: \$175.72/af
 - WOUS: 30,987 acres
 - WP:18,836
 - MN: 12,151
 - # Structures: 39
 - WP: 30
 - MN: 9
- **Alternative #16 (WP 232.5/MN 313.5)**
 - Yield: 627,950
 - Unit Cost after Debt Service: \$159.89/af
 - WOUS: 32,601 acres
 - WP:12,525
 - MN: 20,076
 - # Structures: 44
 - WP: 16
 - MN: 28

Unit Costs based on 100% Yield During Debt Service



RECOMMENDATIONS FOR CONTINUED INTERFACE WITH THE CORPS OF ENGINEERS

Continue Feasibility Study activities with a focus on reallocation at Wright Patman

- Quantify downstream flood protection foregone
- Complete Ecological Function Modeling to identify backwater effects

Accelerate dialog with Corps' Dam Safety "stovepipe" with respect to bundling reallocation and dam safety decisions

Continue dialog with Corps relative to institutional and regulatory framework for a project have both a Corps Civil Works component and a regulatory component

QUESTIONS?