



Western
Area Power
Administration

Draft 10-Year Plan Customer Meeting

July 31, 2018

Desert Southwest Region
Phoenix, AZ



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AGENDA

1. Welcome & Introduction
2. Pivot Strategy
3. FY18 Seed Funded Projects
 - a) Coolidge-Valley Farms
 - b) Kofa-Dome Tap
 - c) Dome Tap-Gila
4. FY19 Bouse Upgrade Project
5. FY20 Bouse-Kofa Rebuild
6. Draft 10-Year Plan/Rate Impacts
7. Prepayment Vote Schedule
8. Next Steps



WELCOME & INTRODUCTION



10-YEAR PLAN PIVOT STRATEGY



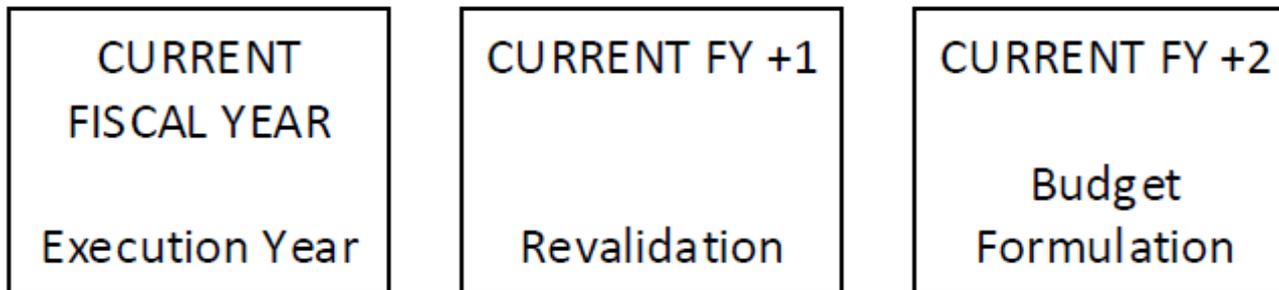
What is the Pivot?

- Onetime effort to shift the 10-Year Plan into alignment with the budget formulation schedule
- Results in approval of prepayment funding two years in advance of the project start
- A successful pivot concludes in December of 2019 with the Prepayment Meeting



Why Do We Need to Pivot?

- Federal budget formulation occurs two fiscal years prior to the execution year (current fiscal year)
- Current process conducts the vote for prepayment funding during the execution year (current fiscal year)

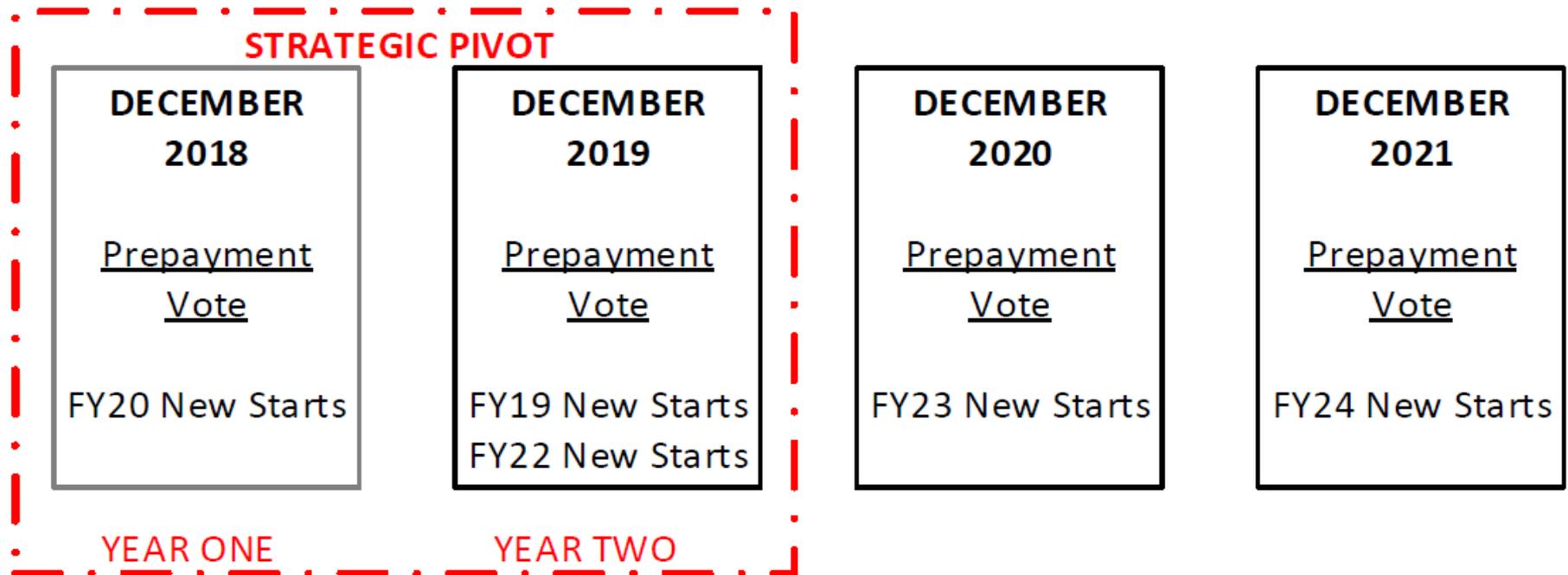


Pivot Schedule

- The Pivot will be conducted across two 10-Year Plan cycles
- The Pivot began January 2018 and will conclude with the prepayment vote in December 2019
- Two stage pivot strategy
 - Stage one in calendar year 2018
 - Stage two in calendar year 2019
- Allows for seed funding of Bouse Upgrade Project with appropriations in FY19
- Provides additional time to review and discuss projects in advance of the prepayment vote in 2019



Pivot Schedule



Note: There are no FY21 proposed new starts



SEED FUNDED PROJECTS



Seed Funding Update

DSW proposed the following projects for FY18 seed funding

FY18 SEED FUNDING PLAN			
PROJECT	*Initial Conceptual Design Estimate	Seed Budget	Total Prepayment Project Cost
Coolidge-Valley Farms 115-kV Rebuild	\$4,815,696	\$800,000	TBD Fall 2018
Kofa-Dome Tap 161-kV Rebuild	\$5,360,022	\$500,000	TBD Fall 2018
Dome Tap-Gila 161-kV Rebuild	\$7,401,431	\$500,000	TBD Fall 2018

* Conceptual design estimate generated during AOA Study



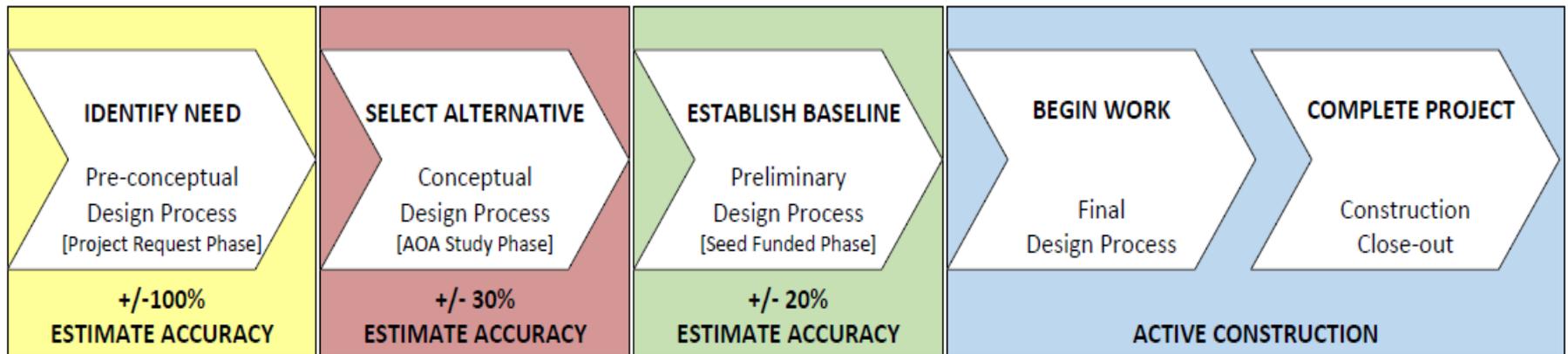
Seed Funding Update

- Seed funding advances the project from a conceptual design estimate (via AOA study), to a preliminary design estimate (via formal design)
- Achieved by developing 50%-75% of the design package
- Project estimate, scope, and schedule is formulated for customer review and consideration at the 10-Year Plan meeting in September



Estimate Accuracy

- Project estimate accuracy for each capital planning phase
- Achieved through progressive elaboration of project scope through design efforts



Estimate Accuracy

Project estimate accuracy will be improved

- All projects are being reevaluated to remove the 20% cost contingency
- This is a result of improvements made through the AOA study process and seed funding
- The 20% reduction subsequently reduces several projects below the \$20M threshold at which Earned Value Management (EVM) is required
- As a result, the 10-Year Plan will see an overall reduction in cost
- Future AOA studies will include additional preliminary environmental analysis.
- The adjustments to the 10-Year Plan and a new rate analysis will be available in advance of the September customer meeting



COOLIDGE-VALLEY FARMS UPDATE



Coolidge-Valley Farms

OVERVIEW

- Seed funding budget = \$800,000
- Design encompasses approximately 6.1 miles from Coolidge Substation to the Valley Farms Substation, along with possible minor substation work
- Replace existing deteriorated wood poles in-kind
- Upgrade the conductor from 4/0 copper (88 MVA) to Cardinal 954 kcmil ACSR and add overhead optical ground wire
- Where possible, the new wood poles will be installed in the same location to avoid environmental and access challenges

UPDATES FROM ORIGINAL SCOPE

- WAPA worked with customers and determined that wood pole structures will be replaced in-kind
- Light-duty steel structures will be used where necessary



KOFA – DOME TAP UPDATE



Kofa-Dome Tap

OVERVIEW

- Seed funding budget = \$500,000
- 7.3 mile transmission line from Kofa Substation to the Dome Tap Substation
- Maintenance activities have replaced all but 7 wood structures with light-duty steel
- This project will replace the remaining 7 structures with light-duty steel
- Upgrade the conductor from 300-kcmil copper core to 336.4-kcmil ACSS
- Replace one overhead ground wire with overhead fiber
- Light-duty steel structures will be installed as required to rectify NESC clearance issues

UPDATES FROM ORIGINAL SCOPE

- The two structures inside Dome Tap (one on DME-GLA line, one on KOF-DME) support each other. Replacing both at same time would be easier and less costly.



DOME TAP – GILA UPDATE



Dome Tap - Gila

OVERVIEW

- Seed funding budget = \$500,000
- 7.5 mile transmission line from Kofa Substation to the Dome Tap Substation
- Maintenance activities have replaced all but 16 wood structures with light-duty steel
- This project will replace the remaining 16 structures with light-duty steel
- Upgrade the conductor from 300-kcmil copper core to 336.4-kcmil ACSS
- Replace one overhead ground wire with overhead fiber
- Light-duty steel structures will be installed as required to rectify NESC clearance issues

UPDATES FROM ORIGINAL SCOPE

- The two structures inside Dome Tap (one on DME-GLA line, one on KOF-DME) support each other. Replacing both at same time would be easier and less costly.



BOUSE UPGRADE PROJECT



Bouse Upgrade Project Overview

- The details of the Bouse Upgrade Project were shared during a Special Customer Working Session on June 7, 2018
- The purpose of the project is to address the ongoing delays and issues of the Parker-Headgate/Parker-Bouse Project (PAD-HDR/PAD-BSE)
- \$958,000 in appropriations has been secured for FY19 to begin the seed design process
- The Bouse Upgrade Project will be voted on December 2019





- The Parker-Liberty #2 (PAD-LIB) 230-kV line would be re-routed to Bouse Substation
- A new 230/161-kV bay would be built to connect to the existing 161-kV yard at Bouse Substation
- The load previously served via the PAD-HDR and PAD-BSE lines would then flow through PAD-LIB



Bouse Upgrade Step 1

Build a new 230-kV transmission line

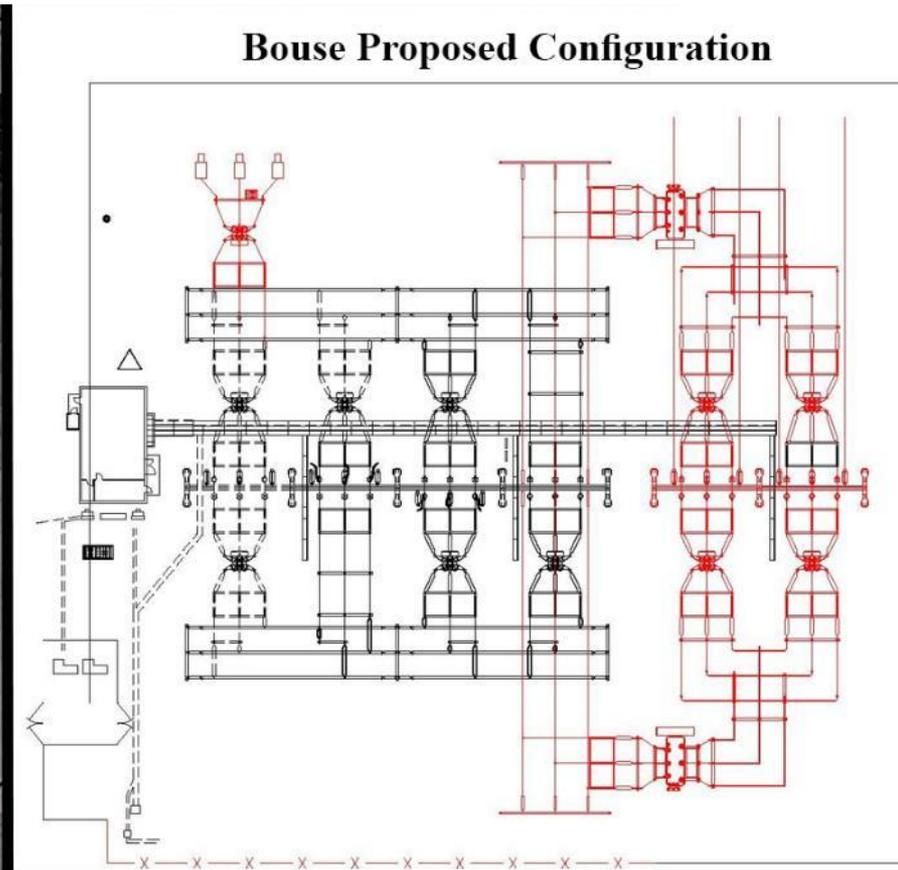
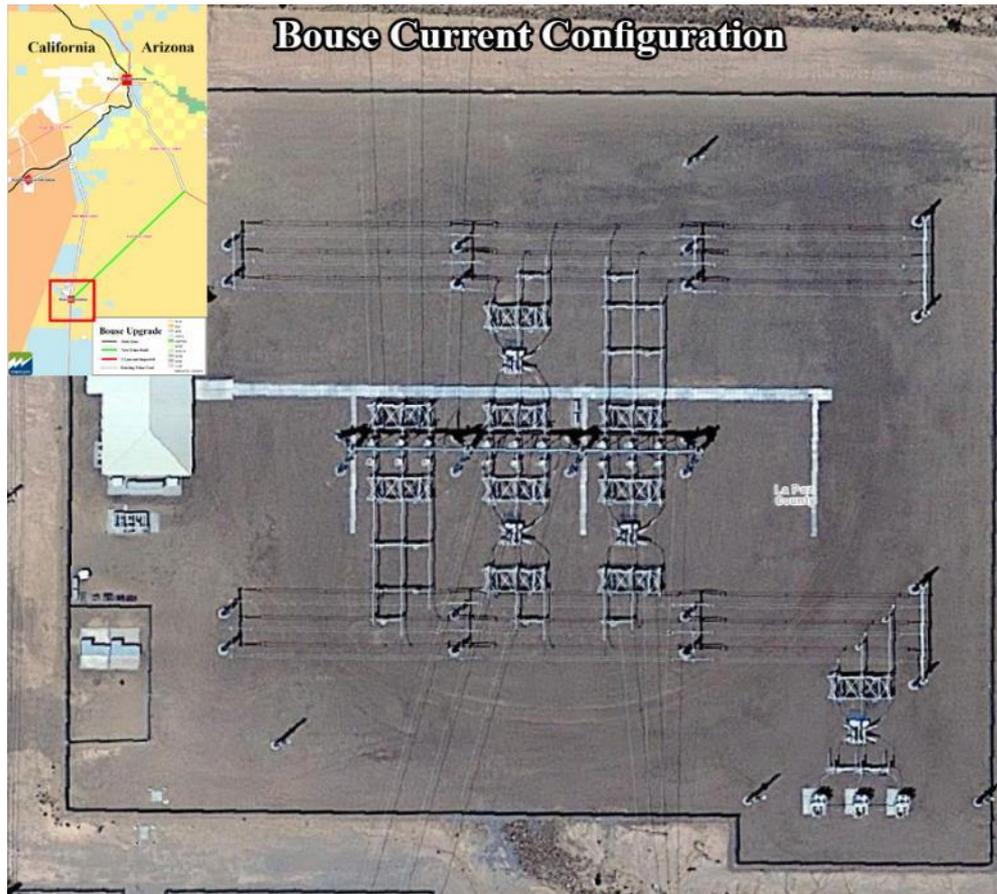
- Construct ~15 miles of new double circuit 230-kV transmission line from Bouse Substation to existing Parker-Liberty #2 transmission line
- Results in redirection of Parker-Liberty 230-kV line through Bouse Substation

Advantages

- Eliminates the Colorado River crossing and public corridors
- Crosses mostly flat BLM land
- Enhances maintainability and reliability
- Resolves land acquisition issues



Bouse Upgrade Step 2



Bouse Upgrade Step 2

Expand Bouse Substation

- Bouse Substation rebuilt in 2012 to 230-kV standards, operated at 161-kV
- Current 3-breaker ring-bus configuration
- Upgrade to a 161-kV double-breaker-double-bus configuration
- Add two 230-kV bays in 4-breaker ring-bus configuration with two 230/161-kV transformers

Advantages

- Increased serviceability – outages can be taken on one transformer while the other remains in service
- No additional land required, new bay will fit within current footprint



Bouse Upgrade Step 3



Bouse Upgrade Step 3

Connect Headgate Rock to Bouse

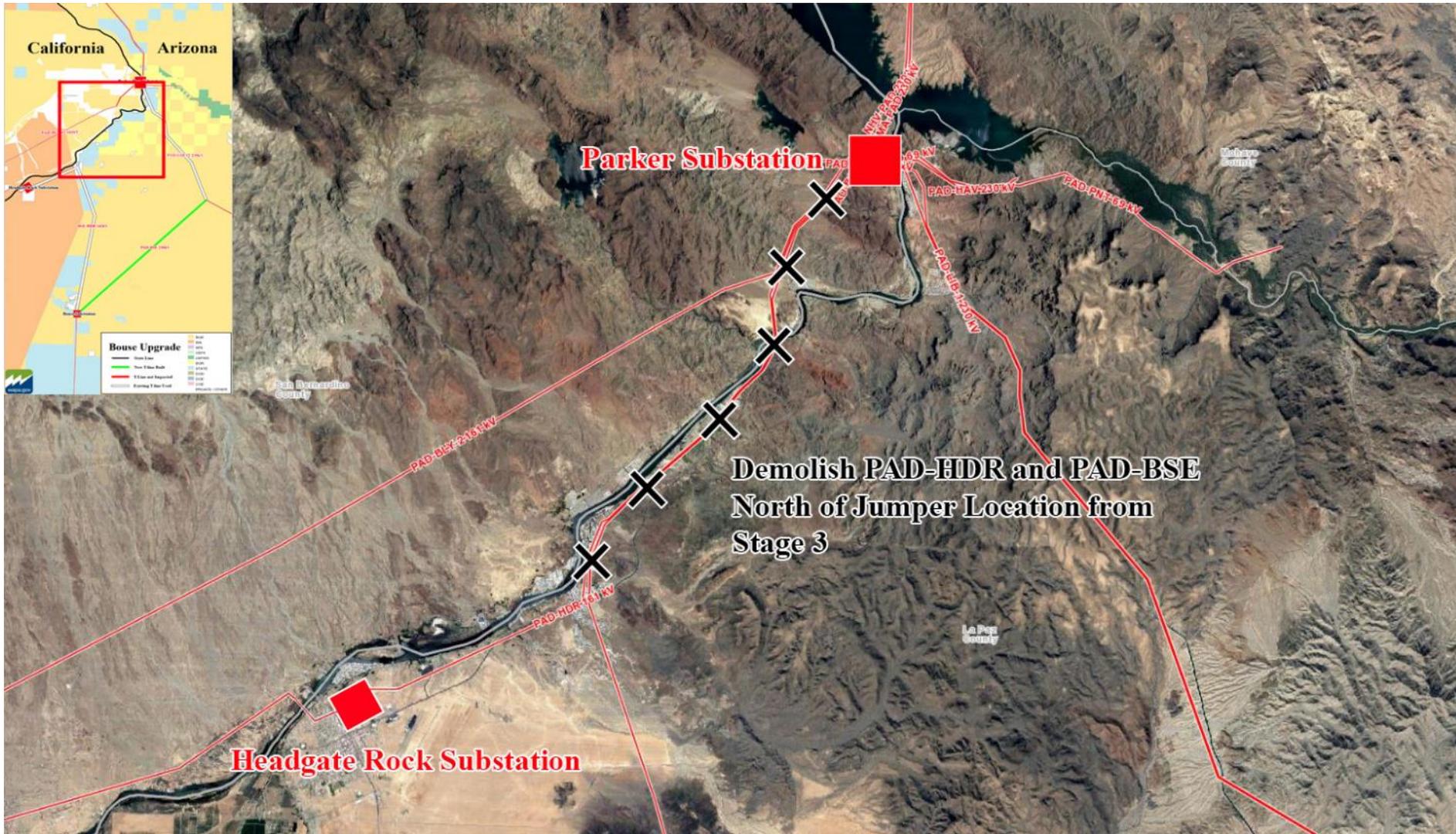
- Install a jumper between the existing Parker-Headgate Rock 161-kV line and the existing Parker-Bouse 161-kV line
- Headgate Rock-Bouse 161-kV line is established

Advantages

- Jumper Option 1 is on private property and is likely to be accepted by the land owner
- The alternative, Jumper Option 2 can be achieved via friendly condemnation



Bouse Upgrade Step 4



Bouse Upgrade Step 4

Remove 20 miles of transmission line

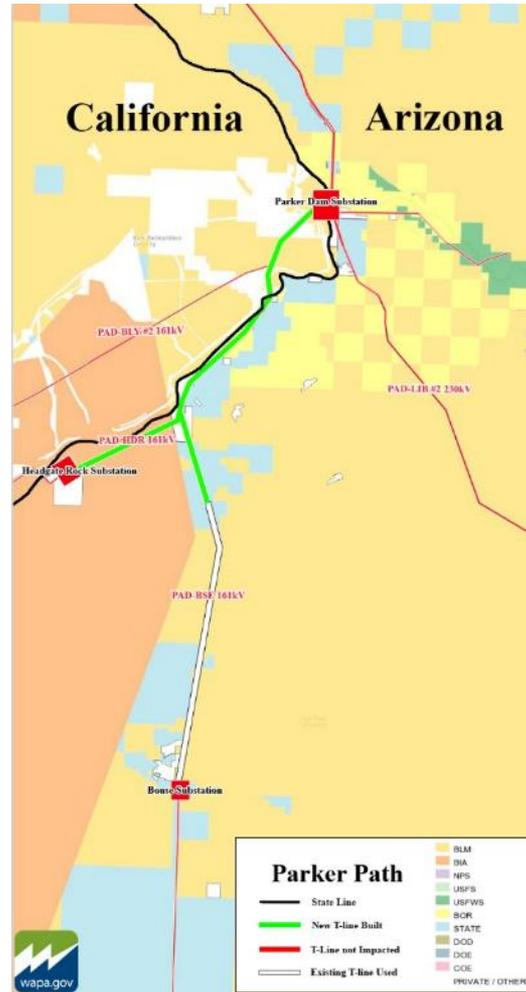
- Remove 10 miles of single circuit transmission line from Parker toward Headgate Rock
- Remove 10 miles of single circuit transmission line from Parker toward Bouse

Advantages

- Removal of transmission lines from Parker Strip eliminates a difficult to maintain section of WAPA's system
- All existing encroachments and clearance violations will be resolved
- Benefits to Parker Substation were discussed during June 7th presentation and will be revisited as the project progresses



Route Comparison



CANCELLATION OF PARKER-HEADGATE ROCK & PARKER-BOUSE PROJECT



Cancellation

- The Bouse Upgrade Project received overwhelming support when shared during June 7th meeting
- Neither of the previously proposed routes for the PAD-HDR/PAD-BSE Project are viable
- As a result WAPA intends to cancel the PAD-HDR/PAD-BSE project
- Cost to date will be capitalized and included in the Bouse Upgrade Project



BOUSE-KOFA 161-KV REBUILD PHASE I & II



Bouse-Kofa 161-kV AOA Study

Project Overview

- AOA study completed in summer 2016
- 84 mile segment of the Parker-Gila transmission line built in 1943
- Single circuit transmission line
- Mix of wood H-Frame structures and light duty steel H-frame structures
 - 82 wood structures remain
 - 211 Light duty steel H-frame structures added in early 2000's
 - In 2006, an 8.4 mile portion of the line was rerouted around the town of Quartzite with 954 ACSR on steel monopoles



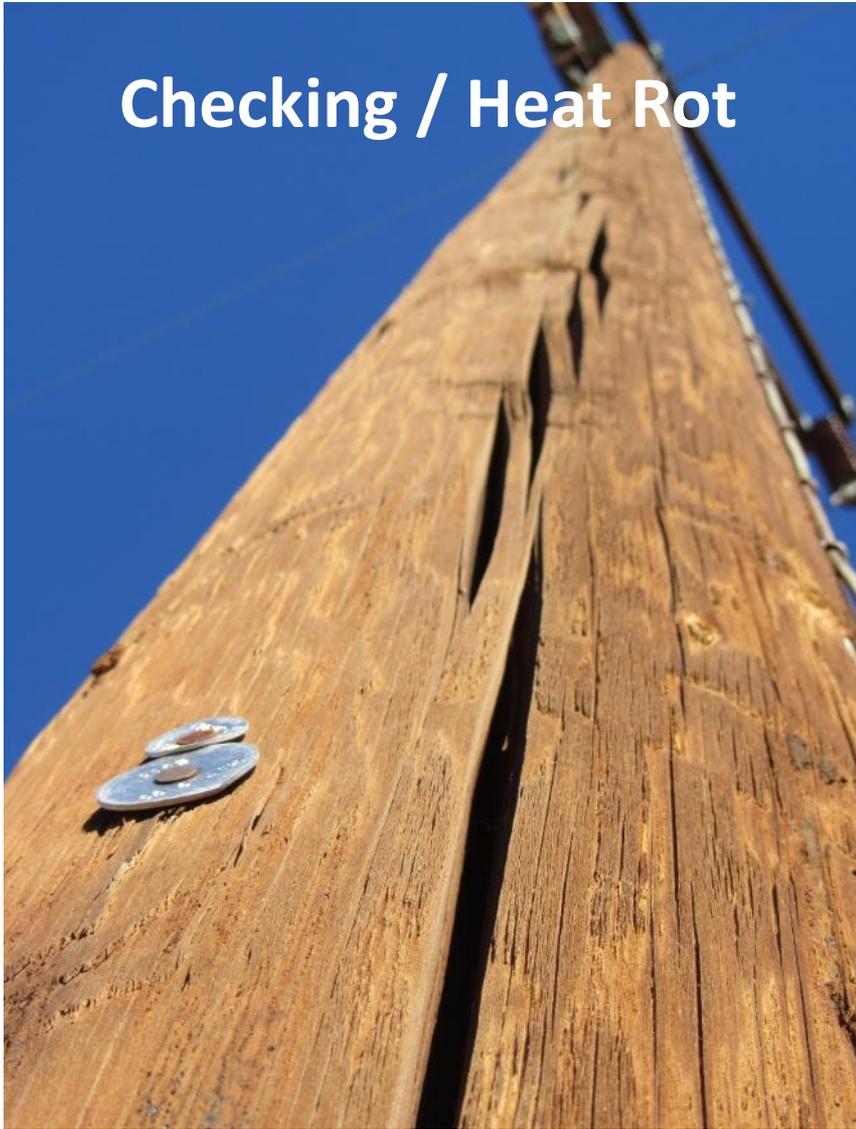
Bouse-Kofa 161-kV AOA Study

Project Justification

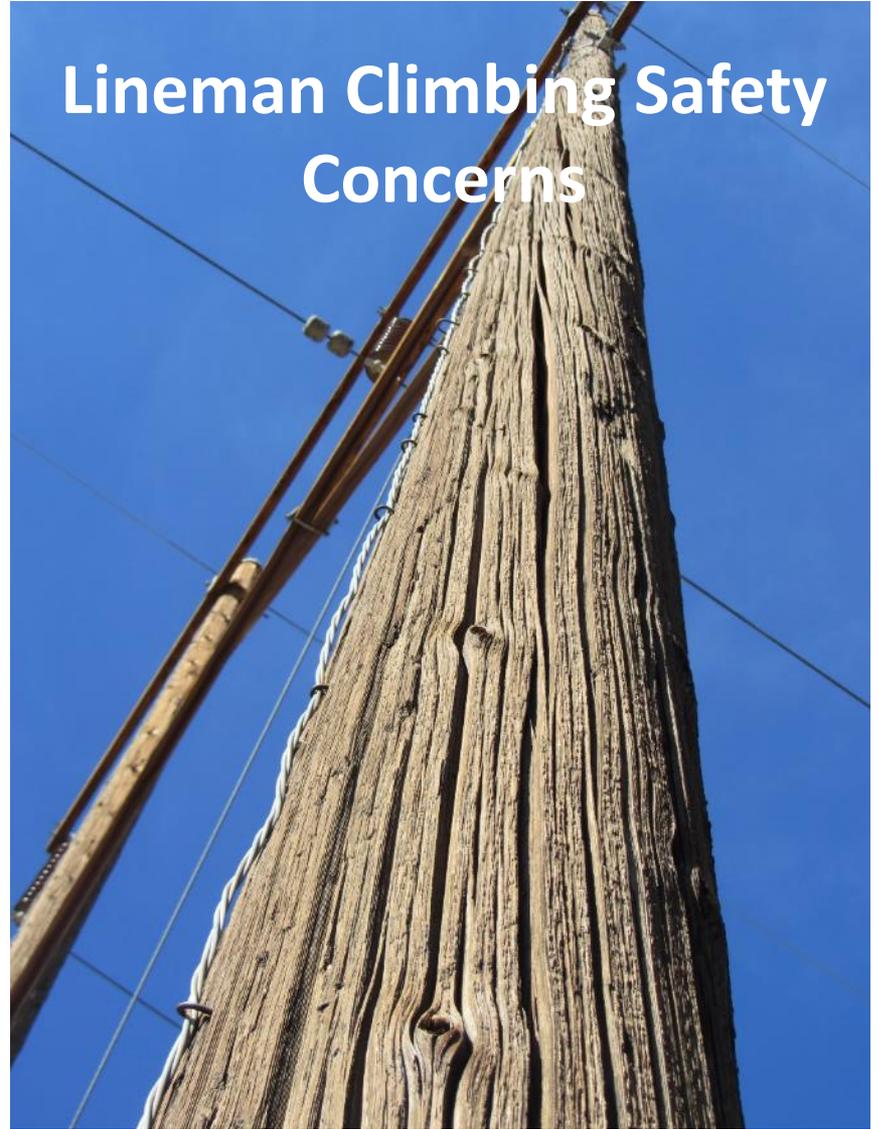
- 106 NERC/NESC violations require corrective action
 - Significant deteriorated and unsafe wood structures
 - Vintage 1943 300 kcmil hollow core copper conductor experiencing significant sag
 - Access roads and ROW require rehabilitation
 - 20-30% of wood poles require replacement immediately
- Additional communication bandwidth is required via fiber optic ground wire to meet current and future protection, control, communication, and security requirements



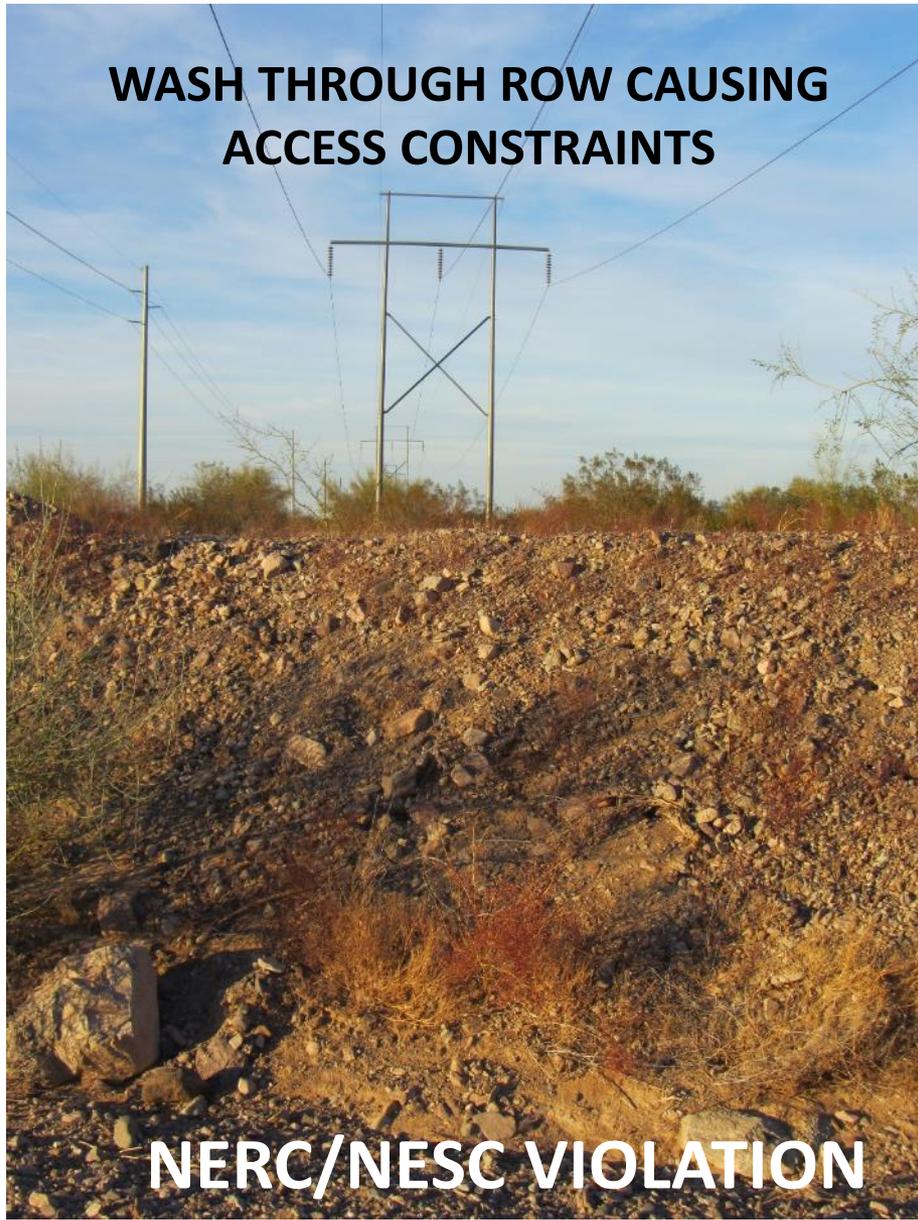
Checking / Heat Rot



Lineman Climbing Safety Concerns



**WASH THROUGH ROW CAUSING
ACCESS CONSTRAINTS**



NERC/NESC VIOLATION



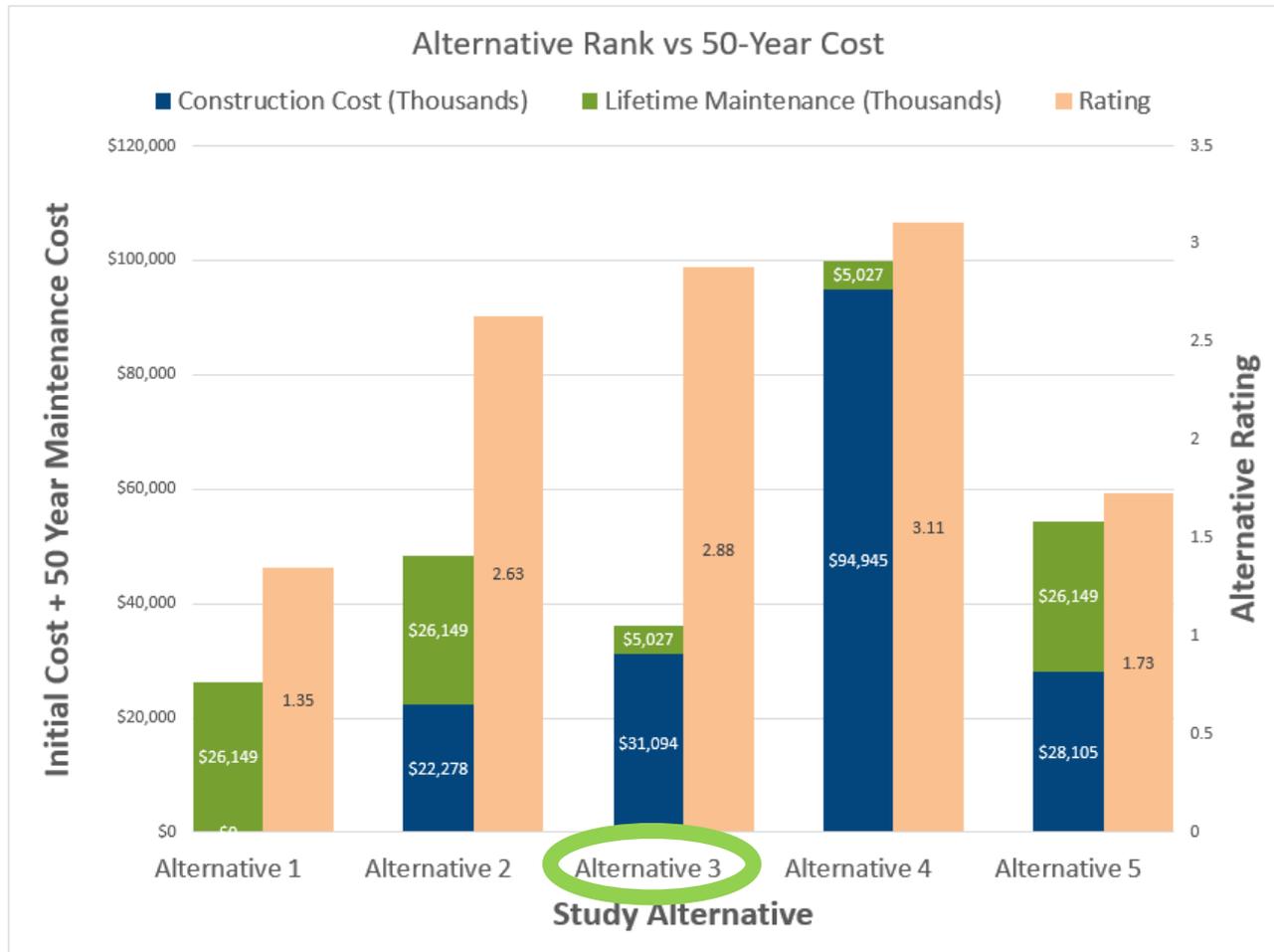
Bouse-Kofa 161-kV AOA Study

Proposed Rebuild Scope

- Reconductor with 336.4-kcmil ACSS to reduce sag, eliminating most of the 106 NERC/NESC violations
- Upgrade 82 wood structures to light duty steel H-frames
 - Of these, ~5-10 will be steel dead-end structures
- Install new steel structures as needed to correct NERC/NESC clearance issues not corrected by the new conductor
- Add Optical Overhead Ground Wire (OPGW)
- Repair/Reclaim ROW access
- Copper conductor has an estimated salvage value of ~\$1.7M



Bouse-Kofa 161-kV AOA Study



Bouse-Kofa 161-kV AOA Study

Selected Alternative 3 – Reconductor & Replace Wood with Light Duty Steel H-Frame Structures

Preferred Alternative #3 Conceptual Estimate	
Rebuild With Light Duty Steel H-Frame Structures	
	TOTAL
Administrative (Inc. Project Management)	\$986,000
EVMS*	\$1,736,000
Design	\$201,000
Construction Contract	\$11,412,000
Government Furnished Equipment (GFE)**	\$10,823,000
Commissioning	\$134,000
Environmental	\$620,000
Contingency	\$5,182,000
Phase I & II Total Project Budget	\$31,094,000



Bouse-Kofa 161-kV AOA Study

FY19 Proposed Projects: Phase I & II - Alternative 3

Project will be a single design with two solicitation packages and separate construction contracts for Phase I and II.

- Phase I
 - ~31 miles of rebuild from Kofa Substation heading north
 - Approximately \$12M total Phase I cost
- Phase II
 - ~44 miles of rebuild from Bouse Substation heading south
 - Approximately \$12M total Phase II cost



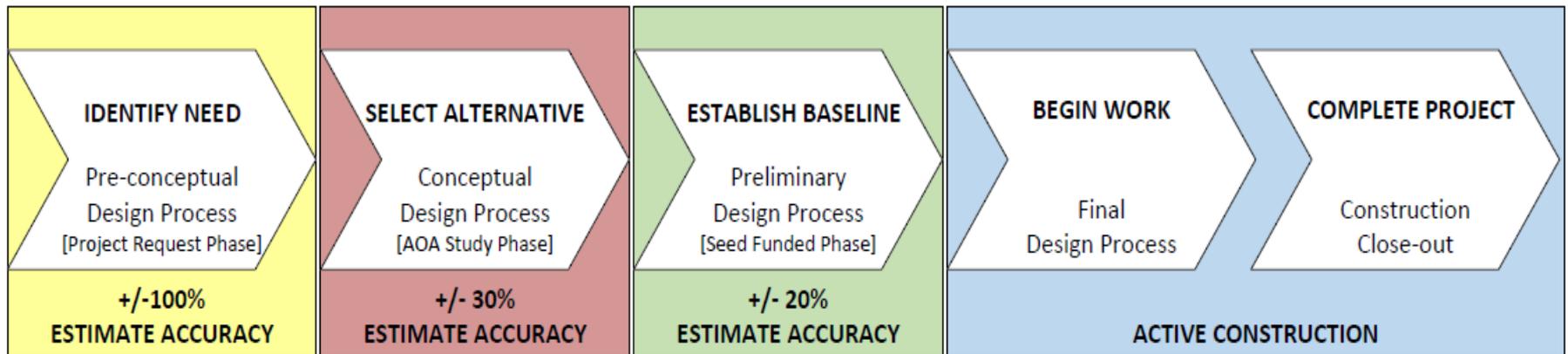


DRAFT 10-YEAR PLAN / RATE IMPACTS



Estimate Accuracy Reminder

- Project estimate accuracy for each capital planning phase
- Achieved through progressive elaboration of project scope through design efforts



Draft 10-Year Plan

PROJECT	TOTAL PROJECT BUDGET	TOTAL PROJECT COST TO DATE	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28
Mesa Substation Remediation	1,970	1,950										
Tucson Substation Rebuild	9,395	9,370										
Gila-Knob 161-kV T-Line Reroute	3,595	3,531										
Black Point Mesa Reroute	2,203	2,175	28									
Parker-Davis Facility Rating Year 2	7,731	7,661	50									
Crossman Peak Microwave Facility	4,525	1,208	3,207	50								
Liberty Series Capacitor Bank Replacement	10,371	7,589	2,622	100								
Gila Substation 161-kV to 230-kV Rebuild	18,995	16,019	2,651	265								
Gila-Wellton Mohawk I-8 Crossing Rebuild	7,515	7,000	429	26								
Kofa-Dome Tap 161-kV Rebuild	5,360		4,300	550	10							
Dome Tap-Gila 161-kV Rebuild	7,401		5,921	970	10							
Coolidge-Valley Farms 115-kV Rebuild	4,816		2,673	1,138	205							
Bouse Upgrade Project	45,015		958	6,613	21,049	7,227	2,166	4,150	2,452	400		
Bouse-Kofa 161-kV Rebuild PHASE-1	15,584			500	7,792	6,236	1,056					
Bouse-Kofa 161-kV Rebuild PHASE-2	15,584			500		7,792	6,236	1,056				
Parker-Blythe 161-kV #2 Rebuild PHASE-1	20,000					500	12,779	6,385	336			
Parker-Blythe 161-kV #2 Rebuild PHASE-2	20,000					500		12,779	6,385	336		
Parker-Blythe 161-kV #2 Rebuild PHASE-3	20,000					500			12,779	6,385	336	
Parker Substation 161-kV Replacements	5,000								250	2,000	2,450	300
Blythe-Headgate Rock #1 line 161-kV Rebuild	23,900								1,195	9,560	11,711	1,434
Rogers-Coolidge 230-kV Reconductor	6,000									2,460	3,360	180
Parker Substation 230-kV Replacements	5,000									500	4,000	500
FISCAL YEAR (FY) TOTALS	259,960	56,503	22,839	10,712	29,066	22,755	22,237	24,370	23,397	21,641	21,857	2,414

1. Cost in Thousands of Dollars
2. Cost to Date 5/31/2018

Estimate Accuracy
Active Construction
±20% Accuracy
±30% Accuracy
±100% Accuracy



10-Year Plan Smoothing Effort

- Finance, Maintenance, and Power Marketing are working together to smooth (flatten) the 10-Year Plan as much as possible.
- Smoothing can be based on:
 - Funding: Expenditures per year and cash flow
 - Constructability: Schedule and available resources
 - In-Service Date: Project-close out and rate impact
- The 10-Year Plan was smoothed primarily based on rate impact
- We will continue these efforts and incorporate refinements into the final 10-Year Plan that will be presented in September



Parker-Davis Project Closeouts

PROJECT	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28
Mesa Substation Remediation	1,950										
Tucson Substation Rebuild	9,370										
Gila-Knob 161-kV T-Line Reroute	3,531										
Black Point Mesa Reroute		2,203									
Parker-Davis Facility Rating Year 2		7,731									
Crossman Peak Microwave Facility			4,525								
Gila Substation 161-kV to 230-kV Rebuild			18,995								
Gila-Wellton Mohawk I-8 Crossing Rebuild			7,515								
Kofa-Dome Tap 161-kV Rebuild				5,360							
Dome Tap-Gila 161-kV Rebuild				7,401							
Coolidge-Valley Farms 115-kV Rebuild				4,816							
Bouse Upgrade Project									45,015		
Bouse-Kofa 161-kV Rebuild PHASE-1						15,584					
Bouse-Kofa 161-kV Rebuild PHASE-2							15,584				
Parker-Blythe 161-kV #2 Rebuild PHASE-1								20,000			
Parker-Blythe 161-kV #2 Rebuild PHASE-2									20,000		
Parker-Blythe 161-kV #2 Rebuild PHASE-3										20,000	
Parker Substation 161-kV Replacements											5,000
Blythe-Headgate Rock #1 line 161-kV Rebuild											23,900
Rogers-Coolidge 230-kV Reconstructor											6,000
Parker Substation 230-kV Replacements											5,000
Total Project Budget (Completed)	14,851	9,934	31,035	17,577	0	15,584	15,584	20,000	65,015	20,000	39,900

Cost in Thousands of Dollars

Estimate Accuracy
Active Construction
±20% Accuracy
±30% Accuracy
±100% Accuracy



Intertie Project Closeouts

PROJECT	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28
Liberty Series Capacitor Bank Replacement			10,371								
Total Project Budget (Completed)	0	0	10,371	0							

Cost in Thousands of Dollars

Estimate Accuracy
Active Construction
±20% Accuracy
±30% Accuracy
±100% Accuracy



Rate Impacts

- Project becomes repayable the year after placed in service
- Rates include Interest During Construction (IDC)
- Different repayment methodologies
 - Parker-Davis Project: 5-year rate window using an average of future capital costs
 - Intertie Project: 50-year rate window, pinch-point (highest year of costs)



Parker-Davis Project Rate Impacts

FY18 Rate without Future Capital \$ 17.16 /kW-Year

PROJECT	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28
Prior Year Projects (Pending Closeout)	\$ 0.04	\$ 0.05	\$ 0.06	\$ 0.06	\$ 0.06	\$ 0.06	\$ 0.06	\$ 0.06	\$ 0.06	\$ 0.06
RRADs	\$ 0.10	\$ 0.22	\$ 0.31	\$ 0.41	\$ 0.53	\$ 0.65	\$ 0.77	\$ 0.88	\$ 0.99	\$ 1.10
Mesa Substation Remediation	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03
Tucson Substation Rebuild	\$ 0.16	\$ 0.16	\$ 0.16	\$ 0.16	\$ 0.16	\$ 0.16	\$ 0.16	\$ 0.16	\$ 0.16	\$ 0.16
Gila-Knob 161-kV T-Line Reroute	\$ 0.06	\$ 0.06	\$ 0.06	\$ 0.06	\$ 0.06	\$ 0.06	\$ 0.06	\$ 0.06	\$ 0.06	\$ 0.06
Black Point Mesa Reroute		\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03
Parker-Davis Facility Rating Year 2		\$ 0.12	\$ 0.12	\$ 0.12	\$ 0.12	\$ 0.12	\$ 0.12	\$ 0.12	\$ 0.12	\$ 0.12
Crossman Peak Microwave Facility			\$ 0.07	\$ 0.07	\$ 0.07	\$ 0.07	\$ 0.07	\$ 0.07	\$ 0.07	\$ 0.07
Gila Substation 161-kV to 230-kV Rebuild			\$ 0.31	\$ 0.31	\$ 0.31	\$ 0.31	\$ 0.31	\$ 0.31	\$ 0.31	\$ 0.31
Gila-Wellton Mohawk I-8 Crossing Rebuild			\$ 0.12	\$ 0.12	\$ 0.12	\$ 0.12	\$ 0.12	\$ 0.12	\$ 0.12	\$ 0.12
Kofa-Dome Tap 161-kV Rebuild				\$ 0.09	\$ 0.09	\$ 0.09	\$ 0.09	\$ 0.09	\$ 0.09	\$ 0.09
Dome Tap-Gila 161-kV Rebuild				\$ 0.12	\$ 0.12	\$ 0.12	\$ 0.12	\$ 0.12	\$ 0.12	\$ 0.12
Coolidge-Valley Farms 115-kV Rebuild				\$ 0.08	\$ 0.08	\$ 0.08	\$ 0.08	\$ 0.08	\$ 0.08	\$ 0.08
Bouse Upgrade Project									\$ 0.88	\$ 0.88
Bouse-Kofa 161-kV Rebuild PHASE-1						\$ 0.31	\$ 0.31	\$ 0.31	\$ 0.31	\$ 0.31
Bouse-Kofa 161-kV Rebuild PHASE-2							\$ 0.31	\$ 0.31	\$ 0.31	\$ 0.31
Parker-Blythe 161-kV #2 Rebuild PHASE-1								\$ 0.43	\$ 0.43	\$ 0.43
Parker-Blythe 161-kV #2 Rebuild PHASE-2									\$ 0.44	\$ 0.44
Parker-Blythe 161-kV #2 Rebuild PHASE-3										\$ 0.44
Parker Substation 161-kV Replacements										
Blythe-Headgate Rock #1 line 161-kV Rebuild										
Rogers-Coolidge 230-kV Reconductor										
Parker Substation 230-kV Replacements										
Total	\$ 0.38	\$ 0.68	\$ 1.28	\$ 1.68	\$ 1.80	\$ 2.22	\$ 2.65	\$ 3.20	\$ 4.62	\$ 5.17

P-DP 5-year Rate Window



Intertie Project Rate Impacts

PROJECT	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28
Prior Year Projects (Pending Closeout)	\$ 0.04	\$ 0.04	\$ 0.06	\$ 0.06	\$ 0.06	\$ 0.06	\$ 0.06	\$ 0.06	\$ 0.06	\$ 0.06
RRADs	\$ 0.00	\$ 0.00	\$ 0.08	\$ 0.14	\$ 0.19	\$ 0.24	\$ 0.30	\$ 0.35	\$ 0.40	\$ 0.45
Liberty Series Capacitor Bank Replacement			\$ 0.29	\$ 0.29	\$ 0.29	\$ 0.29	\$ 0.29	\$ 0.29	\$ 0.29	\$ 0.29
Total	\$ 0.04	\$ 0.04	\$ 0.43	\$ 0.49	\$ 0.54	\$ 0.59	\$ 0.65	\$ 0.70	\$ 0.75	\$ 0.81



PREPAYMENT VOTE SCHEDULE



Prepayment Voting Schedule

December 2018 (Pivot Year 1)	
Project Start	Project Name
FY18	Kofa-Dome Tap 161-kV Rebuild
FY18	Dome Tap-Gila 161-kV Rebuild
FY18	Coolidge-Valley Farms 115-kV Rebuild
FY20	Bouse-Kofa 161-kV Rebuild Phase 1
FY20	Bouse-Kofa 161-kV Rebuild Phase 2

December 2019 (Pivot Year 2)	
Project Start	Project Name
FY19	Bouse Upgrade
FY22	Parker-Blythe 161-kV Rebuild Phase 1

NOTE: No Fiscal Year (FY) 2021 Proposed New Starts

December 2020	
Project Start	Project Name
FY23	TBD -Customer Engagment

December 2021	
Project Start	Project Name
FY24	TBD - Customer Engagment



NEXT STEPS



2018 10-Year Plan Customer Meetings

SEPTEMBER → Formal 10-Year Plan Presentation

DECEMBER → Prepayment Voting Meeting



THANK YOU

