



# DESERT SOUTHWEST REGION 10-YEAR PLAN ACTIVE PROJECT UPDATES



*Figure 1 Liberty Substation*

**QUARTERLY CUSTOMER MEETING: MARCH 29<sup>TH</sup>, 2018**  
**DESERT SOUTHWEST REGIONAL OFFICE**  
**615 S. 43<sup>RD</sup> AVE**  
**PHOENIX, AZ**



# Western Area Power Administration

*POWERING THE ENERGY FRONTIER*





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# 1. MEETING AGENDA

## Conference Call Bridge:

- To access the conference call bridge, please dial **(888)-283-2963**; when requested enter conference code number **13393** and then enter #. When requested provide your name.

## Objective(s):

- Summarize construction projects scheduled for completion in fiscal year 2018.
- Provide status updates on all active construction projects.
- Provide information on the operation and execution of DSW's RRAD program.
- Solicit customer feedback on WAPA DSW's active projects.

## AGENDA:

	Presenter	Time Allotment
1. Welcome	Jimmy Kendrick	5 min
2. Introduction	Tony Guinane	5 min
3. Construction Project Managers – (45 min)		
a. Completed Construction Projects		
i. Tucson Substation	Mike Garcia	5 min
ii. Mesa Substation Remediation	Roger Wright	5 min
b. Active Construction Projects		
i. Parker-Headgate & Parker Bouse	Michael Baird	5 min
ii. Gila Substation 161kV Rebuild	Tony Gagajewski	5 min
iii. Gila-Knob 161kV Rebuild	Tony Gagajewski	5 min
iv. Crossman Peak Microwave Facility	Mike Garcia	5 min
v. Liberty Series Capacitor Bank	Roger Wright	5 min
vi. Gila-Welton Mohawk I-8 Crossing	Tony Gagajewski	5 min
4. Appropriated Seed Funding	Tony Guinane	5 min
a. Kofa-Dome Tap 161kV Rebuild	Mike Garcia	5 min
b. Dome Tap-Gila 161kV Rebuild	Tony Gagajewski	5 min
5. Maintenance Management Specialist	Nancy Ruiz	15 min
a. RRADs Program Management		
b. RRADs 10-Year Plan Overview		

## 10 MINUTE BREAK

6. Pivot Strategy 2018	Cole Shinaman	10 min
7. FY19 Proposed Projects	Tony Guinane	15 min
a. Fly-over video		
b. Bouse-Kofa Phase I/II		
8. FY20-21 Proposed Projects	Tony Guinane	15 Min
a. Fly-over video		
b. Parker-Blythe #2 161kV Phase I (of III phases)		
9. Next Steps	Tony Guinane	5 min
a. <b>June TBD, 2018</b> 10-Year Plan Customer Meeting		
i. Focus: Draft 10-Year Plan Discussion		
b. <b>September TBD, 2018</b> 10-Year Plan Customer Meeting		
i. Focus: Final 10-Year Plan Presentation		
c. <b>December TBD, 2018</b> 10-Year Plan Customer Meeting		
i. Focus: Prepayment (PCN) Vote		





## 2. TABLE OF ACRONYMS

ACSR.....	ALUMINUM CONDUCTOR STEEL REINFORCED
ACSS.....	ALUMINUM CONDUCTOR STEEL SUPPORTED
APS.....	ARIZONA PUBLIC SERVICE
AOA.....	ANALYSIS OF ALTERNATIVES
BES.....	BULK ELECTRIC SYSTEM
BOR.....	BUREAU OF RECLAMATION
BSE.....	BOUSE SUBSTATION
CAP.....	CENTRAL ARIZONA PROJECT
CPC.....	CAPITAL PLANNING COMMITTEE
CTC.....	CUSTOMER TECHNICAL COMMITTEE
CX.....	CATEGORICAL EXCLUSION
CIP.....	CRITICAL INFRASTRUCTURE PROTECTION
DOE.....	DEPARTMENT OF ENERGY
DSW.....	DESERT SOUTHWEST REGION
EA.....	ENVIRONMENTAL ASSESSMENT
E&OC.....	ENGINEERING & OPERATING COMMITTEE
GFE.....	GOVERNMENT FURNISHED EQUIPMENT
IDC.....	INTEREST DURING CONSTRUCTION
IDIQ.....	INDEFINITE DELIVERY/INDEFINITE QUANTITY
JPA.....	JOINT PLANNING AGREEMENT
KCMIL.....	THOUSANDS CIRCULAR MILS
MDCC.....	MAINTENANCE DESIGN CONSTRUCTION COMMITTEE
NEPA.....	NATIONAL ENVIRONMENTAL POLICY ACT
NERC.....	NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION
NESC.....	NATIONAL ELECTRICAL SAFETY CODE
NHPA.....	NATIONAL HISTORIC PRESERVATION ACT
NRHP.....	NATIONAL REGISTER OF HISTORIC PLACES
OGW.....	OVERHEAD GROUND WIRE
O&M.....	OPERATIONS AND MAINTENANCE
OPGW.....	OPTICAL OVERHEAD GROUND WIRE
OGW.....	OVERHEAD GROUND WIRE
PCB.....	POLYCHLORINATED BIPHENYL
PCN.....	PREPAYMENT FUNDS
P-DP.....	PARKER-DAVIS PROJECT
USDA.....	UNITED STATES DEPARTMENT OF AGRICULTURE
RFP.....	REQUEST FOR PROPOSAL
ROM.....	ROUGH ORDER OF MAGNITUDE COST ESTIMATE
ROW.....	RIGHT-OF-WAY
SCE.....	SOUTHERN CALIFORNIA EDISON
TEP.....	TUCSON ELECTRIC POWER
TYP.....	TEN YEAR PLAN
WAPA.....	WESTERN AREA POWER ADMINISTRATION
WCF.....	WESTERN CONSTRUCTION FUNDS





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## 4. COMPLETED PROJECTS FY18

### 4.1 Tucson Substation Rebuild

Originally constructed in 1951, the Tucson Substation facilities and equipment were found to be well beyond expected service life. Due to the risk posed by the age and condition of the yard, WAPA’s customers voted to approve funding that allowed for a new facility to be constructed adjacent to the existing yard. The principal components of the project included: the demolition of an existing warehouse and pump house (including associated site work), construction of a new three-breaker ring bus with two 115-kV bays spaced to 230-kV standards, a new control building, and three (3) new approach spans. All work has now been completed and Project is in the closeout phase.

**Energization date**

- January 2018



Figure 2 Tucson Substation Compacting Gravel Surface

FUNDING SUMMARY	[A]	[B]	[C] [A+B]	[D]	[E] [C-D]	[F]	[G] [C+F]
Funding Type	Original Project Budget	Adjustments To Date	Current Project Budget	Total Executed*	Remaining Funds	Additional Funds Required	Revised Project Budget
Prepayment (PCN)	7,000,000	-	7,000,000	7,173,187	-	173,187	7,173,187
Appropriations (WCF)	-	2,042,967	2,042,967	2,042,967	-	-	2,042,967
<b>Total Project Funding</b>	<b>7,000,000</b>	<b>2,042,967</b>	<b>9,042,967</b>	<b>9,216,154</b>	<b>-</b>	<b>-</b>	<b>9,216,154</b>

\* Executions to date, column "D", include expenses, obligations, and commitments through 2/28/18





## 4.2 Mesa Substation Remediation

The 9.22 acre Mesa substation site entered the Arizona Department of Environmental Quality (ADEQ) Voluntary Remediation Program (VRP) in 2012. The substation, which has long-since been decommissioned, is now located in a relatively populated residential area. As an initial step to comply with the VRP, WAPA contracted out a remedial work plan that was approved by ADEQ in summer 2014. The ultimate goal of the remediation effort was to return the site to residential standards in order for proper disposal of the property through the Government Services Administration (GSA).

The demolition and remediation was completed on July 21, 2017. All yard equipment, including support structures, buildings, concrete foundations, and underground oil piping that were left in place have now been fully removed from the site. Prior to entering the GSA process, the final remediation report is being reviewed by ADEQ. The amount realized for the property is undetermined and will depend upon the purchasing entity and provisions provided by GSA.

WAPA does not have a need or use for the property currently or in the foreseeable future. As government owned land the property will be cleared and prepared for sale through the GSA process. As part of that process, the property must meet state environmental agency requirements prior to the disposal. The amount realized for the property is undetermined and will depend upon the purchasing entity and provisions provided to them by GSA. WAPA has inquired about possible land swap options and will continue to seek a land disposal option that maximizes the benefit to the Parker-Davis Project.

### Projected Completion

- Field activities completed November 2017
- Project close out May 2018



*Figure 3 Mesa Substation Remediation Results*





<b>FUNDING SUMMARY</b>	[A]	[B]	[C] [A+B]	[D]	[E] [C-D]	[F]	[G] [C+F]
Funding Type	Original Project Budget	Adjustments To Date	Current Project Budget	Total Executed*	Remaining Funds	Additional Funds Required	Revised Project Budget
Prepayment (PCN)	1,025,000	2,510,000	3,535,000	638,155	2,896,845	-	3,535,000
Appropriations (WCF)		1,343,262	1,343,262	1,343,262	-	-	1,343,262
<b>Total Project Funding</b>	<b>1,025,000</b>	<b>3,853,262</b>	<b>4,878,262</b>	<b>1,981,417</b>	<b>2,896,845</b>	<b>-</b>	<b>4,878,262</b>

\* Executions to date, column "D", include expenses, obligations, and commitments through 2/28/18





## 5. ACTIVE CONSTRUCTION PROJECTS

### 5.1 Parker - Headgate Rock & Parker- Bouse 161-kV Rebuild

**Status:** On-hold in preconstruction design phase

#### Project Description

This transmission line re-build project consists of replacing the existing line from Parker to Headgate Rock (part of the Parker to Blythe system) and partially from Parker to Bouse (part of the Parker to Gila system). The rebuild will replace the existing wood pole structures with steel structures. A majority of these transmission line structures are showing signs of advanced degradation or have far surpassed the recommended life cycle.

A new 230-kV transmission system replacing the existing 161-kV circuits had been originally proposed, but considering load demand and system forecasting models in the service region, an in-kind 161-kV system was selected as the new construction design for this project. The line will be configured as a double circuit shortly after departing from the Parker Substation for the proposed alignment on either the California or Arizona side of the Colorado River. At a point not yet determined, the line will transition to single circuit transmission lines, connecting with the existing Parker-Bouse circuit, and southwest to Headgate Rock Substation pending final routing approval. Several options are now being considered with regard to routing and reuse of existing rights-of-way in an effort to control and reduce total cost to the project.



Figure 4 Right-of-way along the Parker-Bouse/Headgate Rock 161-kV lines





Following Government to Government Consultation, WAPA has received a new proposed and preferred Colorado River crossing location from the Colorado River Indian Tribe (CRIT). The new river crossing is further upstream than the original crossing locations and utilizes CRIT land. WAPA is continuing to coordinate with CRIT to advance the project while also investigating other new alignment options including the use of the existing alignment.

**Project Milestones & Schedule Updates**

- On July 18<sup>th</sup> and 19<sup>th</sup>, 2017, WAPA held public scoping meetings in Parker presenting the California/CRIT alignment and the existing alignment as possible options. The comment period is still open but a meeting summary is being prepared for review.
- Approved for Pre-payment funding October 2013

**Projected Energization**

- The project is subject to being placed on hold upon the completion of the design package until a final route is identified.

**Project Updates**

- WAPA is investigating all alignment options to reduce cost and project scope.
- WAPA met with CRIT to present the possible option to make use of the existing alignment.
- No GFE has been purchased to date.

**Project Risk(s)**

- Construction phase will be on hold until the total project budget is revalidated on an established design and routing plan

<b>FUNDING SUMMARY</b>	[A]	[B]	[C] [A+B]	[D]	[E] [C-D]	[F]	[G] [C+F]
<b>Funding Type</b>	<b>Original Project Budget</b>	<b>Adjustments To Date</b>	<b>Current Project Budget</b>	<b>Total Executed*</b>	<b>Remaining Funds</b>	<b>Additional Funds Required</b>	<b>Revised Project Budget</b>
Prepayment (PCN)	17,954,000	(334,176)	17,619,824	517,386	17,102,438	-	17,619,824
Appropriations (WCF)	-	792,099	792,099	792,099	-	-	792,099
<b>Total Project Funding</b>	<b>17,954,000</b>	<b>457,923</b>	<b>18,411,923</b>	<b>1,309,485</b>	<b>17,102,438</b>	<b>-</b>	<b>18,411,923</b>

\* Executions to date, column "D", include expenses, obligations, and commitments through 2/28/18





## 5.2 Gila Substation 161-kV Rebuild

**Status:** Active preconstruction design and procurement phase

### Project Description

The Gila Substation (161-kV, 69-kV, 34.5-kV and 4.16-kV) was originally constructed in 1949. Many components in the yards present safety risks to equipment and personnel. The lack of proper spacing and clearance distances is forcing WAPA to take outages to conduct routine maintenance work in its current configuration. The rebuild of the 161-kV yard to current standards will increase worker safety, lessen the possibility of equipment flashover and failure, while eliminating outages to conduct routine maintenance work.

The Gila Substation Rebuild Project was initiated in 2013 and since inception, numerous vital design changes were necessitated to ensure the reliability of present and future customer's needs. This project will completely rebuild the Gila 161-kV Substation and will operate at 230-kV standards in the future. The rebuild of the 161-kV substation will increase reliability and will also replace aged components that have become unreliable and a detriment to the WAPA System. In addition, a new control building will be constructed to accommodate all needs for the substation. The existing 161-kV yard will be demolished once the new 161-kV system is operational to create space for the future reconstruction of the 69-kV and 34.5-kV yards.



*Figure 5 Gila Substation*





**Project Milestones & Schedule Updates**

- Construction mobilization projected October 2018
- 100% Spec and Design Submittal to Procurement Projected April 2018
- Approved for Pre-payment funding in October 2016
- Approved for Pre-payment funding in October 2014

**Projected Energization**

- April 2020

**Project Updates**

- All lands activities complete
- All pre-construction environmental activities complete
- Design at 90% complete

**Project Risk(s)**

- Limited outage durations (Yuma Irrigation District restrictions and impacts to local traffic lighting)

<b>FUNDING SUMMARY</b>	[A]	[B]	[C] [A+B]	[D]	[E] [C-D]	[F]	[G] [C+F]
Funding Type	Original Project Budget	Adjustments To Date	Current Project Budget	Total Executed*	Remaining Funds	Additional Funds Required	Revised Project Budget
Prepayment (PCN)	12,000,000	5,135,365	17,135,365	5,603,538	11,531,827	-	17,135,365
Appropriations (WCF)	-	1,858,635	1,858,635	1,858,635	-	-	1,858,635
<b>Total Project Funding</b>	<b>12,000,000</b>	<b>6,994,000</b>	<b>18,994,000</b>	<b>7,462,173</b>	<b>11,508,223</b>	<b>-</b>	<b>18,994,000</b>

\* Executions to date, column "D", include expenses, obligations, and commitments through 2/28/18





### 5.3 Gila-Knob 161-kV Rebuild

**Status:** Active construction phase

#### Project Description

This project is located near the Arizona Public Service's (APS) North Gila Substation and includes the removal and disposal of existing ACSR conductor, overhead ground wire, and wood pole structures; installation of Government-furnished single and double-circuit steel structures and ACCR conductor; and providing ACSS conductor, optical ground wire (OPGW), and insulator assemblies as part of the 230-kV rebuild of the Gila-Knob 161-kV Transmission Line from structures 4/9 through 5/2. The project includes reattaching existing conductor and overhead ground wire (OGW), moving OGW at structure 4/8 and adding signs at structure 4/6. Two circuits of ACCR Martin conductors and one OPGW will be installed between structures 4/9L and 4/10L; and 4/9R and 4/10R under the APS 500-kV approach spans and shall be completed with the lines energized.



*Figure 6 Looking West from structure 4/9 to 5/2 on North side of Gila North substation*

#### Project Milestones & Schedule Updates

- Projected closeout begins May 2018
- Outage completion April 6, 2018
- Construction began January 2018
- Approved for Pre-payment funding October 2016
- Approved for Pre-payment funding October 2014

#### Projected Energization/Completion

- April 2018





**Project Updates**

- Field construction began January 2018

**Project Risk(s)**

- The contractor will be working under three energized APS 500-kV lines from structures 4/9 to 4/10, both left and right alignments.

<b>FUNDING SUMMARY</b>	[A]	[B]	[C] [A+B]	[D]	[E] [C-D]	[F]	[G] [C+F]
<b>Funding Type</b>	<b>Original Project Budget</b>	<b>Adjustments To Date</b>	<b>Current Project Budget</b>	<b>Total Executed*</b>	<b>Remaining Funds</b>	<b>Additional Funds Required</b>	<b>Revised Project Budget</b>
Prepayment (PCN)	2,000,000	728,158	2,728,158	2,185,399	542,759	-	2,728,158
Appropriations (WCF)	1,976,042	-	1,976,042	1,975,748	-	-	1,976,042
<b>Total Project Funding</b>	<b>3,976,042</b>	<b>728,158</b>	<b>4,704,200</b>	<b>4,161,147</b>	<b>543,053</b>	-	<b>4,704,200</b>

\* Executions to date, column "D", include expenses, obligations, and commitments through 2/28/18





## 5.4 Crossman Peak Microwave Facility

**Status:** Active preconstruction design and procurement phase

### Project Description

The scope of this project includes the construction of a WAPA owned microwave communication site on Crossman Peak, adjacent to an existing non-WAPA communication site. Crossman Peak is located east of Lake Havasu City. The new site will support the primary microwave communications between WAPA's existing Christmas Tree Pass and Metal Mountain communication sites. This project includes land acquisition, equipment shelter, communication tower, backup generator with fuel tanks, a distribution power line for primary power, and an access easement.

### Project Milestones & Schedule Updates

- Construction start January 2019
- Final Design and Spec to procurement August 2018
- Engineering to complete design package June 2018
- Environmental Assessment projected completion by October 2017
- Approved for Pre-payment funding October 2016



*Figure 7 Satellite View of Crossman Peak Future Location*





**Projected Energization**

- December 2018 (pending BLM/NEPA scheduling)

**Project Updates**

- WAPA headquarters is working with BLM lands to acquire right-of-way and access to site
- WAPA headquarters Design Team has started the design of the 12’x24’ communication building
- New project schedule to coordinate with BLM/NEPA schedule in FY17/18

**Project Risk(s)**

- Project currently on track with no major risks identified

<b>FUNDING SUMMARY</b>	[A]	[B]	[C] [A+B]	[D]	[E] [C-D]	[F]	[G] [C+F]
<b>Funding Type</b>	<b>Original Project Budget</b>	<b>Adjustments To Date</b>	<b>Current Project Budget</b>	<b>Total Executed*</b>	<b>Remaining Funds</b>	<b>Additional Funds Required</b>	<b>Revised Project Budget</b>
Prepayment (PCN)	4,525,000	-	4,525,000	971,624	3,553,376	-	4,525,000
Appropriations (WCF)	-	-	-	-	-	-	-
<b>Total Project Funding</b>	<b>4,525,000</b>	<b>-</b>	<b>4,525,000</b>	<b>971,624</b>	<b>3,553,376</b>	<b>-</b>	<b>4,525,000</b>

\* Executions to date, column "D", include expenses, obligations, and commitments through 2/28/18





## 5.5 Liberty Series Capacitor Bank

**Status:** Active procurement phase

### Project Description

The Liberty 345-kV Cap Bank replacement project is currently in the procurement phase. The existing capacitor bank (PU1A) was made by Westinghouse and is rated at 345-kV, 110-MVar, and 850 Amps (508 MVA). This station equipment was commissioned in 1969 and has degraded significantly due to its age. Capacitor Bank award was made in August 2017 and requires a 1 year lead time for delivery. Appropriated funds were delegated to DSW in which WAPA utilized approximately \$3.7 million for the purchase of the capacitor bank.



*Figure 8 Liberty Substation*

### Project Milestones & Schedule Updates

- Construction field activities to be complete May 2019.
- Outage on the Liberty – Peacock 345-kV transmission line is scheduled for January 2019 – March 2019.
- Construction tentatively scheduled for June, 2018 – April, 2019.
- Capacitor bank delivery no later than October 2018
- Final specification and design review January 2018
- Government Furnished Equipment (GFE) – Capacitor bank solicitation was issued May 2017

### Projected Energization

- April 2019





**Project Updates**

- Capacitor bank equipment In manufacturing stage
- Factory acceptance testing is scheduled for May 1, 2018 – May 3, 2018 in Gansevoort, NY.

**Project Risk(s)**

- Early load request by Griffith, outage window reduced to October – March (previously May)

<b>FUNDING SUMMARY</b>	[A]	[B]	[C] [A+B]	[D]	[E] [C-D]	[F]	[G] [C+F]
Funding Type	Original Project Budget	Adjustments To Date	Current Project Budget	Total Executed*	Remaining Funds	Additional Funds Required	Revised Project Budget
Prepayment (PCN)	10,372,000	(3,776,633)	6,595,367	1,898,861	4,696,506	-	6,595,367
Appropriations (WCF)	-	3,776,633	3,776,633	3,776,633	-	-	3,776,633
<b>Total Project Funding</b>	<b>10,372,000</b>	<b>-</b>	<b>10,372,000</b>	<b>5,675,494</b>	<b>4,696,506</b>	<b>-</b>	<b>10,372,000</b>

\* Executions to date, column "D", include expenses, obligations, and commitments through 2/28/18





## 5.6 Gila-Wellton Mohawk 161-kV Rebuild

**Status:** Active preconstruction design phase

### Project Description

The Gila-Wellton Mohawk (GLA-WML) 161-kV transmission line rebuild project was initiated at the beginning of FY17 as part of the Seed Funding Pilot Program. WAPA kicked off the project and began design work to rebuild 2.8 miles of the original wood structures along GLA-WML. The line was erected in 1956 and the structures are well beyond the recommended lifespan and rehabilitation efforts are no longer viable. Many of the poles display visual symptoms of advanced external shell rot, along with weathering and large cracks.

During 2017, a majority of the GLA-WML structures were replaced by WAPA maintenance personnel; however, the stretch of transmission line that traverses rugged, mountainous terrain was not replaced. This was due in part because many of the structures have no existing access roads and those that do require significant roadwork for vehicular travel. In conjunction with the rebuild effort, WAPA will reestablish access roads where economically feasible to reduce the potential for helicopter only access. In addition, overhead optical ground wire will be installed between GLA-WML.



Figure 9 Gila-Wellton Mohawk Structures 6/7 thru 9/8



**Project Milestones & Schedule Updates**

- Construction ends May 2019
- Construction begins November 2018
- Construction contract award May 2018
- 100% design January 2018
- Prepayment full project funding approved October 2017
- Appropriated Seed Funding approved October 2016

**Projected Energization/Completion**

- May 2019

**Project Updates**

- ROW Lands and environmental activities progressing on time
- 100% design completed on time
- All GFE and primary contract currently in procurement process

**Project Risk(s)**

- Due to the terrain, the use of micro-piles is being considered for structures in some of the least accessible locations. Micro-piles are widely used; however, the technology is new to WAPA.
- There is a risk associated with the planned vs. actual costs associated with the design and construction of the micro-piles.



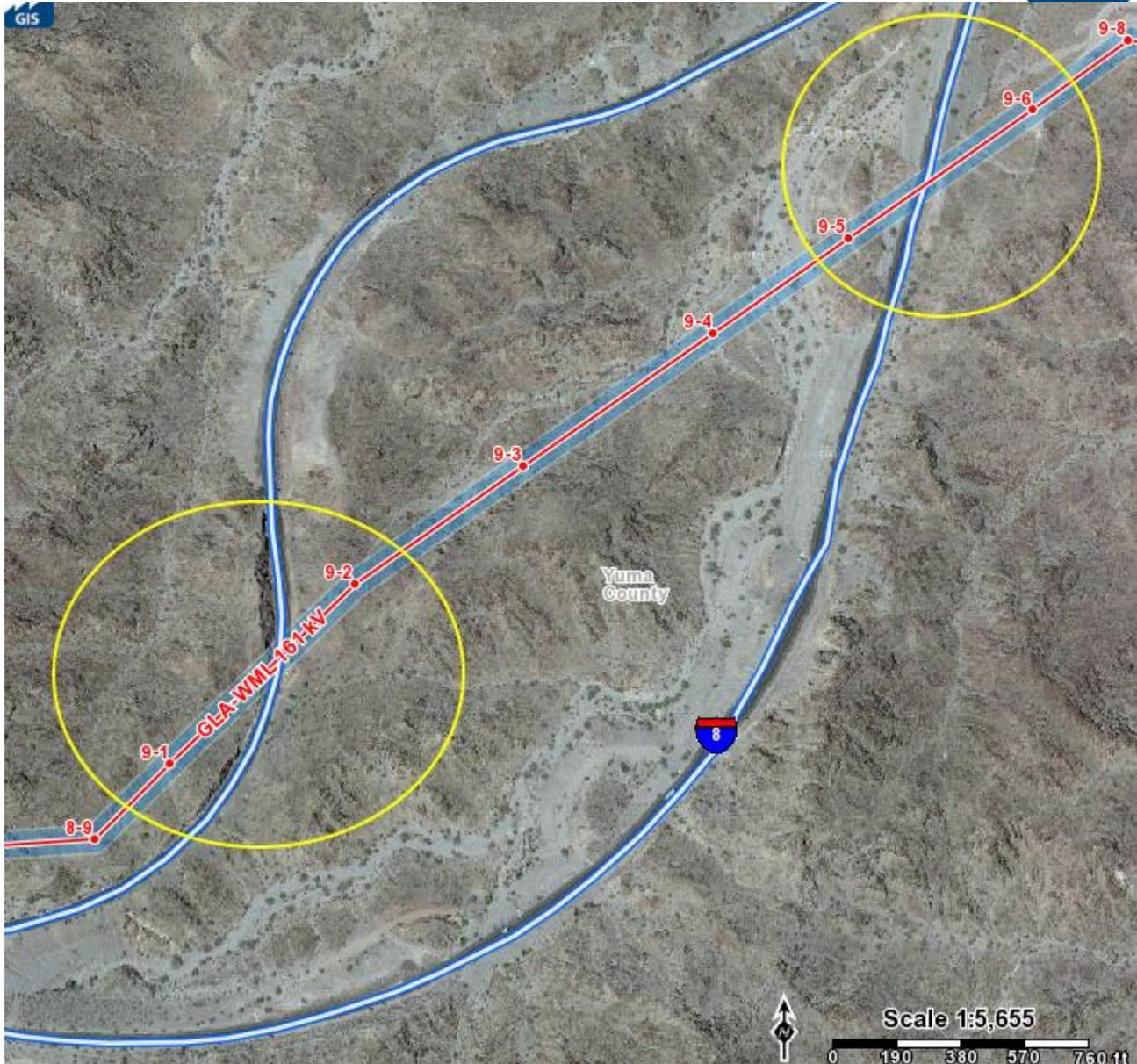


Figure 10 Locations where the GLA – WML crosses the interstate

FUNDING SUMMARY	[A]	[B]	[C] [A+B]	[D]	[E] [C-D]	[F]	[G] [C+F]
Funding Type	Original Project Budget	Adjustments To Date	Current Project Budget	Total Executed*	Remaining Funds	Additional Funds Required	Revised Project Budget
Prepayment (PCN)	-	7,242,665	7,242,665	48,082	7,194,583	-	7,242,665
Appropriations (WCF)	400,000	(122,011)	277,989	277,989	-	-	277,989
<b>Total Project Funding</b>	<b>400,000</b>	<b>7,120,654</b>	<b>7,520,654</b>	<b>326,071</b>	<b>7,194,583</b>	<b>-</b>	<b>7,520,654</b>

\* Executions to date, column "D", include expenses, obligations, and commitments through 2/28/18





## 5.7 Coolidge Valley Farms 115kV Rebuild

**Status:** Active preconstruction design phase (Seed Funding Phase Only)

### Project Description

The Coolidge to Valley Farms (COL-VAF) 115-kV transmission line has been identified as a concern in WAPA's BES (Bulk Electric System). The line was originally commissioned in 1943 and runs through flat desert terrain, comprised of farm land and rural housing. The structures are mainly wood H-frame structures strung with a 4/0 copper conductor and two overhead ground wires. The COL-VAF line makes up a 6.1-mile segment of the Coolidge to Oracle (COL-ORA) 45-mile transmission line. This 115-kV system originates in central Arizona and travels to the southeast region of Arizona feeding Bureau of Indian Affairs and numerous regional utility companies in the Tucson region.



*Figure 11 Split Pole on Coolidge-Valley Farm Transmission Line*

### Scope

WAPA would clear ROW access roads, upgrade 6.1 miles of 4/0 copper conductor to meet 180 – 230MVA, 115kV rating, replace failing wood poles in-kind, and replace one steel OGW with one overhead optical ground wire (OPGW). Access roads will be improved as needed.

### Project Justification

The COL-VAF line is at capacity relative to commitments and alternate paths may be required to provide additional service to the southern Arizona's 115-kV system maintaining status quo. The current capacity of the line is approximately 88MVA and WAPA planning deems that a minimum capacity of 180MVA is required for reliability requirements.





If the COL-VAF 115-kV line is not upgraded in time other temporary mitigation measures will be necessitated. NERC TPL-001-4 Performance Requirements do not allow facility emergency ratings to be exceeded, as a result pre-mitigation actions must be taken to prepare for the possibility that any of the planning event contingencies occur. This could include limiting the amount of allowable load growth in the Valley Farms and Oracle areas. In addition, it could also require actions from the Operations group such as but not limited to load shedding, generation curtailment, and system reconfiguration.

The probability to overload the COL-VAF line under presented contingencies is based on load and generation in the area. Although it is possible to overload the line today under unusual generation patterns with high load, it is more likely that WAPA would begin to see more consistent issues in the summer of 2020. This is based on historical load data, typical load growth for the Valley Farms and Oracle areas, and historical generation use north and south of the COL-VAF line.

WAPA analysis identified various performance gaps/deficiencies associated with this line and four possible alternatives to addressing these issues.

- NESC clearance violations have been identified and need to be corrected
- Noted deterioration and unsafe structures are significant
- Existing condition of access roads and rights-of-way is poor and limits access
- Additional communication requirements have been identified

**Project Milestones & Schedule Updates**

- Seed funded >50% design package and revalidated project estimate June 2018
- Design kick-off March 2018
- Project kick-off meeting February 2018
- Submit revalidated project estimate and scope of work for customer approval and prepayment funding December 2018

<b>FUNDING SUMMARY</b>	[A]	[B]	[C] [A+B]	[D]	[E] [C-D]	[F]	[G] [C+F]
Funding Type	Original Project Budget	Adjustments To Date	Current Project Budget	Total Executed*	Remaining Funds	Additional Funds Required	Revised Project Budget
Prepayment (PCN)	800,000	-	800,000	-	800,000	-	800,000
Appropriations (WCF)	-	-	-	-	-	-	-
<b>Total Project Funding</b>	<b>800,000</b>	<b>-</b>	<b>800,000</b>	<b>-</b>	<b>800,000</b>	<b>-</b>	<b>800,000</b>

\* Executions to date, column "D", include expenses, obligations, and commitments through 2/28/18

<b>FY2018 SEED FUNDING PLAN</b>				
PROJECT	CONCEPTUAL PROJECT COST	APPROPRIATED SEED FUNDS FY2018	PREPAYMENT SEED FUNDS FY2018	PREPAYMENT FUNDS REQUEST FY2019
Coolidge Valley Farms	\$4,815,696	-	\$800,000	TBD Fall 2018





## 5.8 Kofa-Dome Tap 161kV Rebuild

**Status:** On hold pending available appropriated Seed Funding

### Project Description

The Kofa to Dome Tap (KOF-DME) is a single-circuit, 7.3-mile, 161-kV transmission line segment along the Parker-Gila 161-kV line built in 1943. The KOF-DME Transmission Line is located in western Arizona running south from the Kofa substation to the Dome Tap substation. Kofa substation is located approximately 16 miles northeast from the city of Yuma, while Dome Tap is located 7.3 miles southwest of Kofa Substation.

The line was originally constructed with 300 kcmil hollow core copper conductors. Most of the wood H-Frame structures have been replaced with light duty steel H-Frame structures, and only seven wood structures remain in service.



*Figure 12 Kofa-Dome Tap existing wood pole structure*

### Scope

WAPA will replace 7.3 miles of three 300 kcmil hollow core copper conductors with three 336.4 kcmil ACSS conductors, replace one steel OGW with OPGW, and install light duty steel H-frame structures to replace the seven wood structures left in the line segment. Install new light duty steel H-frame steel structures as needed to correct clearance issues not corrected by stringing new ACSS conductor. Access roads will be improved as needed.





### Project Justification

WAPA analysis identified various performance gaps/deficiencies associated with this line and five possible alternatives to addressing these issues.

#### Experienced and/or Observed Issues:

- NERC violations have been identified and need to be corrected
- Safety concerns are significant due to high level of observed deterioration
- Existing condition of access roads and rights-of-way is poor and limits adequate access
- Additional communication requirements have been identified

#### NERC Violations:

NERC requires all transmission line owners/operators to perform a Facility Rating Analysis of all transmission lines over 100-kV in order to determine the as-built condition and de-rate the line to that condition, or to mitigate the condition to achieve the design rating. There are eight cases of phase-to-ground clearances not meeting the minimum clearance required by the National Electrical Safety Code (NESC) and NERC.

#### Line Conditions:

There were five structures identified by WAPA's maintenance group as needing replacement and even more replacement recommendations are expected when detailed ground inspection is completed.



*Figure 13 Kofa Dome Tap deteriorated wood pole*





Access Roads and ROW:

According to maintenance field inspection reports, there are numerous cases of access roads and right-of-way paths requiring improvement to facilitate construction and maintenance activities. In some cases, new access roads will need to be constructed. A lack of prompt access to the transmission line presents reliability, safety, and cost risks.

Communications Requirements:

The installation of OPGW provides an alternate and physically independent path for protection, control and communication. Currently microwave provides the only communication path and the addition of an OPGW will allow for the future communication bandwidth needs to be met. Those needs include increased security such as live feed video cameras and IT networks at substations; the addition of these systems will exceed the current communications bandwidth provided by microwave.

**Project Milestones & Schedule Updates**

- As of March 23<sup>rd</sup>, 2018 congress passed an approved budget. Appropriations are currently transferring from DOE to WAPA HQ. Upon receipt the funds will be distributed to all regions.

**Projected Energization**

- To be determined once project formally kicks-off

**Project Updates**

- Construction has initiated the formal Design Process.

**Project Risk(s)**

- Managing project delays due to appropriations and continuing resolution

FUNDING SUMMARY	[A]	[B]	[C] [A+B]	[D]	[E] [C-D]	[F]	[G] [C+F]
Funding Type	Original Project Budget	Adjustments To Date	Current Project Budget	Total Executed*	Remaining Funds	Additional Funds Required	Revised Project Budget
Prepayment (PCN)	-	-	-	-	-	-	500,000
Appropriations (WCF)	500,000	-	500,000	-	500,000	-	-
<b>Total Project Funding</b>	<b>500,000</b>	<b>-</b>	<b>500,000</b>	<b>-</b>	<b>500,000</b>	<b>-</b>	<b>500,000</b>

\* Executions to date, column "D", include expenses, obligations, and commitments through 2/28/18

FY2018 SEED FUNDING PLAN				
PROJECT	CONCEPTUAL PROJECT COST	APPROPRIATED SEED FUNDS FY2018	PREPAYMENT SEED FUNDS FY2018	PREPAYMENT FUNDS REQUEST FY2019
Kofa-Dome Tap Rebuild	\$5,360,022	\$500,000	-	TBD Fall 2018





## 5.9 Dome Tap-Gila 161kV Rebuild

**Status:** On hold pending available appropriated Seed Funding

### Project Description

Dome Tap (DME) to Gila (GLA) is a single circuit, 7.5 mile, 161-kV transmission line segment of the overall Parker-Gila 161-kV line built in 1943. The line runs through agricultural, residential, and commercial property as well as hills and flat low desert terrain. The northern line section crosses State Route (SR) 95 several times, the Union Pacific Railroad and the Wellton Mohawk Canal. The line traverses BLM land and a Proposed Critical Habitat area around the Gila River. The DME-GLA line is constructed with 300 kcmil hollow core copper conductor on wood H-Frame structures and light duty steel H-frame structures, only 16 wood structures remain in this segment.

### Scope

WAPA would clear ROW access roads and pads, replace 7.6 miles of 300 kcmil hollow core copper conductors with 336.4 kcmil ACSS conductors, replace one steel OGW with OPGW, and install light duty steel H-frame structures to replace the 16 wood structures. Light duty steel H-frame steel structures will also be installed as needed to correct clearance issues not corrected by stringing new ACSS conductor. Access roads will be improved as needed.

### Project Justification

WAPA analysis identified various performance gaps/deficiencies associated with this line.



*Figure 14 DME-GLA wood pole checking/cracking*





Experienced and/or Observed Issues:

- Eight NERC ground clearance violations have been identified and need to be corrected.
- Ten of the 16 wood structures are deteriorated and unsafe requiring replacement.
- Forty-three access roads and right-of-way constraints have been identified where conditions are unsafe and deteriorating.
- Additional communication requirements have been identified.

**Project Milestones & Schedule Updates**

- As of March 23<sup>rd</sup>, 2018 congress passed an approved budget. Appropriations are currently transferring from DOE to WAPA HQ. Upon receipt the funds will be distributed to all regions.

**Projected Energization**

- To be determined once project formally kicks-off

**Project Updates**

- Construction has initiated the formal Design Process.

**Project Risk(s)**

- Managing project delays due to appropriations and continuing resolution

<b>FUNDING SUMMARY</b>	[A]	[B]	[C] [A+B]	[D]	[E] [C-D]	[F]	[G] [C+F]
<b>Funding Type</b>	<b>Original Project Budget</b>	<b>Adjustments To Date</b>	<b>Current Project Budget</b>	<b>Total Executed*</b>	<b>Remaining Funds</b>	<b>Additional Funds Required</b>	<b>Revised Project Budget</b>
Prepayment (PCN)	-	-	-	-	-	-	500,000
Appropriations (WCF)	500,000	-	500,000	-	500,000	-	-
<b>Total Project Funding</b>	<b>500,000</b>	<b>-</b>	<b>500,000</b>	<b>-</b>	<b>500,000</b>	<b>-</b>	<b>500,000</b>

\* Executions to date, column "D", include expenses, obligations, and commitments through 2/28/18

<b>FY2018 SEED FUNDING PLAN</b>				
<b>PROJECT</b>	<b>CONCEPTUAL PROJECT COST</b>	<b>APPROPRIATED SEED FUNDS FY2018</b>	<b>PREPAYMENT SEED FUNDS FY2018</b>	<b>PREPAYMENT FUNDS REQUEST FY2019</b>
Dome Tap-Gila Rebuild	\$7,401,431	\$500,000	-	TBD Fall 2018





## 6. RETIREMENTS, REPLACEMENTS, ADDITIONS, DELETIONS (RRADs) PROGRAM

### 6.1 Overview

Retirement, Replacement, and Additions otherwise known as “RRAD” projects are typically completed in less than one year, and primarily rely on Federal labor to complete. Minimal design is required, and most of the material required is industry standard and easily attainable. RRAD projects are completed using existing WAPA Craft personnel and do not usually require contracted labor (Refer to the Appendices for the RRADs projects listing). There are exceptions to this, all construction no matter the value or labor requirement in Boulder Canyon, CRSP, CAP, Levee and Salinity are accounted for in the RRAD program.





6.2 FY18-FY27 RRADs Capital Program

FY18 - FY27 DESERT SOUTHWEST RRADs CAPITAL PROGRAM														
REF. NO.	PROJECT DESCRIPTION	LOCATION	BUDGET ACTIVITY	ORG	FY18 BUDGET ALLOCATIONS	FY19 BUDGET SUBMISSION	FY20 BUDGET SUBMISSION	FY21 BUDGET PLAN	FY22 BUDGET PLAN	FY23 BUDGET PLAN	FY24 BUDGET PLAN	FY25 BUDGET PLAN	FY26 BUDGET PLAN	FY27 BUDGET PLAN
<b>GGBC - BOULDER CANYON</b>														
1	Sub Equipment Replacements - General (GGBC)	TBD	N/FGBC SUBSB	G52	\$0	\$0	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
	<b>G5200 TOTALS</b>				\$0	\$0	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
2	Relay Replacements - Line & Transfer Breaker	MED B	N/FGBC SUBSB	G53	\$0	\$200,000	\$200,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	Transformer Relay Replacements	MED B	N/FGBC SUBSB	G53	\$100,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	Misc. Communications Facilities Replacement (GGBC)	TBD	N/FGBC SUBSB	G53	\$0	\$0	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
	<b>G5300 TOTALS</b>				\$100,000	\$200,000	\$400,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
5	Hoover- Mead 1 thru 8 Jumper Replacement	HVRMED	N/FGBC LINSB	G56	\$250,000	\$200,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	<b>G5600 TOTALS</b>				\$250,000	\$200,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	<b>BOULDER CANYON TOTALS</b>				\$350,000	\$400,000	\$600,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000
<b>CAP - CENTRAL ARIZONA PROJECT</b>														
1	Sub Equipment Replacements - General (GGCA)	TBD	N/FGCA SUBSB	G52	\$0	\$0	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
2	"SPH" - HVAC Unit Replacement	SPH	N/FGCA SUBSB	G52	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	<b>G5200 TOTALS</b>				\$0	\$0	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
3	Fiber Optic - Cisco Equipment - BDP0002B-R-12421	BDP	N/FGCA COMMB	G53	\$72,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	Fiber Optic - Cisco Equipment - PCO0002B-R-12421	PCO	N/FGCA COMMB	G53	\$72,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	Fiber Optic - Cisco Equipment - RRK0002B-R-12421	RRK	N/FGCA COMMB	G53	\$72,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	Outyear projects -TBD	TBD	N/FGCA COMMB	G53	\$0	\$0	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
	<b>G5300 TOTALS</b>				\$216,000	\$0	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
7	Hassayampa Tap	HAT/HAP	N/FGCA LINSB	G56	\$7,500,000	\$300,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	Transmission Line Replacement	ED2SGR2	N/FGCA LINSB	G56	\$3,328,500	\$500,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	<b>G5600 TOTALS</b>				\$10,828,500	\$800,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	<b>CAP TOTALS</b>				\$11,044,500	\$800,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000





FY18 - FY27 DESERT SOUTHWEST RRADs CAPITAL PROGRAM

REF. NO.	PROJECT DESCRIPTION	LOCATION	BUDGET ACTIVITY	ORG	FY18 BUDGET ALLOCATIONS	FY19 BUDGET SUBMISSION	FY20 BUDGET SUBMISSION	FY21 BUDGET PLAN	FY22 BUDGET PLAN	FY23 BUDGET PLAN	FY24 BUDGET PLAN	FY25 BUDGET PLAN	FY26 BUDGET PLAN	FY27 BUDGET PLAN
<b>GGCR - COLORADO RIVER STORAGE PROJECT</b>														
1	Warehouse/Workspace with BOR	GC	N/FGCR SUBSB	G50	\$550,000	\$1,000,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	Replacement of GC 345kV Breakers (1292, 3492, 5596, 5682) REMOVED BREAKERS WERE REBUILT PER BRAY	GC	N/FGCR SUBSB	G50	\$0	\$0	\$0	\$0	\$1,600,000	\$0	\$0	\$0	\$0	\$0
3	Replacement of GC 230kV Breakers (7482, 7282, 8082)	GC	N/FGCR SUBSB	G50	\$0	\$0	\$0	\$600,000	\$0	\$900,000	\$0	\$0	\$0	\$0
4	Replacement of PPK 345kV Breakers (1596 & 1692)	PPK	N/FGCR SUBSB	G50	\$0	\$0	\$0	\$550,000	\$0	\$800,000	\$0	\$0	\$0	\$0
5	Replacement of GC 345kV Breakers ( 194 & 594)	GC	N/FGCR SUBSB	G50	\$0	\$0	\$0	\$0	\$0	\$550,000	\$0	\$800,000	\$0	\$0
6	Replacement of GC 345kV Breakers (1092, 1196, 3292)	GC	N/FGCR SUBSB	G50	\$0	\$0	\$0	\$0	\$0	\$0	\$825,000	\$0	\$1,200,000	\$1,200,000
7	Replacement of GC 230kV Breakers (7682, 7982)	GC	N/FGCR SUBSB	G50	\$0	\$0	\$0	\$0	\$0	\$0	\$400,000	\$0	\$580,000	\$580,000
	<b>G5000 TOTALS</b>				\$550,000	\$1,000,000	\$0	\$1,150,000	\$1,600,000	\$2,250,000	\$1,225,000	\$800,000	\$1,780,000	\$1,780,000
8	Test Equipment	MOVVP	N/FGCR MOVVPB	G52	\$120,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000
9	Replacement of PPK 230kV Breaker 2982	PPK	N/FGCR COMMB	G52	\$190,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	VU1B-1/CCVT Coupling Capacitor Voltage Transformer	PPK	N/FGCR COMMB	G52	\$70,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	REPLACEMENT 230KV DISCONNECTS	PPK	N/FGCR COMMB	G52	\$60,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	<b>G5200 TOTALS</b>				\$440,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000
	<b>G53 - Communication Projects</b>													
12	Comm Site Building Replacement With Environmental	MGS	N/FGCR COMMB	G53	\$60,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	WIN/CIP 7 Security Relay Encryption	MULTI-SITES	N/FGCR COMMB	G53	\$15,000	\$72,963	\$800,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	Comm Tower Replacement - Microwave Site - Glen Canyon MW (GCM G0002B)	GCM	N/FGCR SUBSB	G53	\$450,000	\$20,000	\$20,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	MW Upgrades w Environmental - GCM_JPK0001B	GCM/JPK	N/FGCR COMMB	G53	\$60,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	MW Upgrades w Environmental - JPK_GCM0001B	JPK/GCM	N/FGCR COMMB	G53	\$55,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	MW Upgrades w Environmental - (JPK_PSM0001B)	JPK/PSM	N/FGCR COMMB	G53	\$55,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0





FY18 - FY27 DESERT SOUTHWEST RRADs CAPITAL PROGRAM

REF. NO.	PROJECT DESCRIPTION	LOCATION	BUDGET ACTIVITY	ORG	FY18 BUDGET ALLOCATIONS	FY19 BUDGET SUBMISSION	FY20 BUDGET SUBMISSION	FY21 BUDGET PLAN	FY22 BUDGET PLAN	FY23 BUDGET PLAN	FY24 BUDGET PLAN	FY25 BUDGET PLAN	FY26 BUDGET PLAN	FY27 BUDGET PLAN
<b>GGCR - COLORADO RIVER STORAGE PROJECT CONTINUED...</b>														
18	MW Upgrades w Environmental - (PSM_JPK0001B)	PSM/JPK	N/FGCR COMMB	G53	\$60,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
19	MW Upgrades (GCM_ZIL0002B)	GCM/ZIL	N/FGCR COMMB	G53	\$50,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
20	MW Upgrades (ZIL_GCM0002B)	ZIL/GCM	N/FGCR COMMB	G53	\$60,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
21	MW Upgrades (ZIL_LOL_0002B)	ZIL/LOL	N/FGCR COMMB	G53	\$50,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
22	MW Upgrades (LOL_ZIL_0002B)	LOL/ZIL	N/FGCR COMMB	G53	\$50,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
23	Comm Site Building Replacement With Environmental	TOW	N/FGCR COMMB	G53	\$0	\$0	\$200,000	\$800,000	\$0	\$0	\$0	\$0	\$0	\$0
24	Remote Terminal Unit (RTU) Replacement	FLG	N/FGCR COMMB	G53	\$0	\$147,037	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
25	RTU Replacements (Communication Sites)	ELD/CAN	N/FGCR COMMB	G53	\$0	\$85,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
26	Glen Canyon Microwave Tower Replacement	GCM	N/FGCR COMMB	G53	\$0	\$0	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
27	RTU Replacements (Communication Sites)	PSM/GCS	N/FGCR COMMB	G53	\$0	\$0	\$85,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
28	Power System Replacement	TBD	N/FGCR COMMB	G53	\$0	\$0	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
29	RTU Replacement (RTAC)	LHV	N/FGCR COMMB	G53	\$0	\$0	\$0	\$150,000	\$0	\$0	\$0	\$0	\$0	\$0
30	RTU Replacements (Communication Sites)	TBD	N/FGCR COMMB	G53	\$0	\$0	\$0	\$85,000	\$85,000	\$85,000	\$85,000	\$85,000	\$85,000	\$85,000
<b>G53 - Protection Projects</b>														
31	Relay Replacements - Transfer Breaker & Bus Diff	PPK	N/FGCR SUBSB	G53	\$90,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
32	Meter Replacement - Revenue & Panel	GC/PWL	N/FGCR SUBSB	G53	\$100,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
33	PRC-002-2 Digital Monitoring Equipment Upgrades & Team Additions	PPK	N/FGCR SUBSB	G53	\$140,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
34	Relay Replacements - Transformer	PPK	N/FGCR SUBSB	G53	\$200,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
35	Remedial Action Scheme (GCS0022B)	GCS	N/FGCR SUBSB	G53	\$40,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
36	Remedial Action Scheme (FLG0019B)	FLG	N/FGCR SUBSB	G53	\$40,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
37	Remedial Action Scheme (PPK0064B)	PPK	N/FGCR SUBSB	G53	\$20,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0





FY18 - FY27 DESERT SOUTHWEST RRADs CAPITAL PROGRAM

REF. NO.	PROJECT DESCRIPTION	LOCATION	BUDGET ACTIVITY	ORG	FY18 BUDGET ALLOCATIONS	FY19 BUDGET SUBMISSION	FY20 BUDGET SUBMISSION	FY21 BUDGET PLAN	FY22 BUDGET PLAN	FY23 BUDGET PLAN	FY24 BUDGET PLAN	FY25 BUDGET PLAN	FY26 BUDGET PLAN	FY27 BUDGET PLAN
GGCR - COLORADO RIVER STORAGE PROJECT CONTINUED...														
38	Meter Replacement - Revenue & Panel	PPK	N/FGCR SUBSB	G53	\$0	\$175,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
39	Relay Replacements - Line Relays, 69kV	GCS	N/FGCR SUBSB	G53	\$0	\$250,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
40	Relay Replacements - Transfer Breaker & Bus Diff	PPK	N/FGCR SUBSB	G53	\$0	\$210,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
41	PRC-002-2 Digital Monitoring Equipment Upgrades & Team Additions	TBD	N/FGCR SUBSB	G53	\$0	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
42	Meter Replacement - Revenue & Panel	LHV	N/FGCR SUBSB	G53	\$0	\$0	\$50,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
43	Relay Replacements - Line & RTU (RTAC)	KAY	N/FGCR SUBSB	G53	\$0	\$0	\$300,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
44	Relay Replacements - Line/Transformer	TBD	N/FGCR SUBSB	G53	\$0	\$0	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
45	Meter Replacement - Revenue & Panel	TBD	N/FGCR SUBSB	G53	\$0	\$0	\$0	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
<b>G5300 TOTALS</b>					<b>\$1,595,000</b>	<b>\$1,160,000</b>	<b>\$1,955,000</b>	<b>\$1,585,000</b>	<b>\$635,000</b>	<b>\$635,000</b>	<b>\$635,000</b>	<b>\$635,000</b>	<b>\$635,000</b>	<b>\$635,000</b>
46	KV2D 24/4-kV Transformer Replacement	GC	N/FGCR SUBSB	G56	\$500,000	\$100,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
47	Physical Security	GC/PPK/FLG	N/FGCR SUBSB	G56	\$450,000	\$225,244	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
48	Glen Canyon to Shiprock 60Mvar 230KV Reactors	GC	N/FGCR SUBSB	G56	\$4,360,000	\$300,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
49	GC Erosion and Waterline Project	GC	N/FGCR SUBSB	G56	\$1,350,778	\$3,017,000	\$835,000	\$624,000	\$0	\$0	\$0	\$0	\$0	\$0
50	Pinnacle Peak-Replace Shunt Cap Bank	PPK	N/FGCR SUBSB	G56	\$0	\$3,774,756	\$1,520,000	\$1,140,000	\$380,000	\$0	\$0	\$0	\$0	\$0
51	Replacement of PPK 345kV Breakers (1196) PER BRAY MOVE TO G56 FUNDING PLAN DONE	PPK	N/FGCR SUBSB	G56	\$0	\$0	\$350,000	\$400,000	\$1,600,000	\$0	\$0	\$0	\$0	\$0
52	Replacement of PPK 345kV Breakers (2199, 2292) PER BRAY MOVE TO G56 FUNDING PLAN DONE	PPK	N/FGCR SUBSB	G56	\$0	\$0	\$700,000	\$400,000	\$1,600,000	\$0	\$0	\$0	\$0	\$0
53	Replacement of 6 Bypass Breakers (FLG 194 & 594, KAY 1086 & 1386, and PPK 2192 & 2299)	FLG/PPK/KAY	N/FGCR SUBSB	G56	\$0	\$1,360,000	\$0	\$2,050,000	\$0	\$0	\$0	\$0	\$0	\$0
<b>G5600 TOTALS</b>					<b>\$6,660,778</b>	<b>\$8,777,000</b>	<b>\$3,405,000</b>	<b>\$4,614,000</b>	<b>\$3,580,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>CRSP TOTALS</b>					<b>\$9,245,778</b>	<b>\$10,997,000</b>	<b>\$5,420,000</b>	<b>\$7,409,000</b>	<b>\$5,875,000</b>	<b>\$2,945,000</b>	<b>\$1,920,000</b>	<b>\$1,495,000</b>	<b>\$2,475,000</b>	<b>\$2,475,000</b>





FY18 - FY27 DESERT SOUTHWEST RRADs CAPITAL PROGRAM														
REF. NO.	PROJECT DESCRIPTION	LOCATION	BUDGET ACTIVITY	ORG	FY18 BUDGET ALLOCATIONS	FY19 BUDGET SUBMISSION	FY20 BUDGET SUBMISSION	FY21 BUDGET PLAN	FY22 BUDGET PLAN	FY23 BUDGET PLAN	FY24 BUDGET PLAN	FY25 BUDGET PLAN	FY26 BUDGET PLAN	FY27 BUDGET PLAN
<b>GGCL - LEVEE</b>														
1	Army Tap / Senator Wash Line	ATP/SEW	N/FGCL LINSB	G52	\$1,000,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	<b>G5200 TOTALS</b>				\$1,000,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	Gila-Gila Valley Lateral Rebuilds	GLA/GIV	N/FGCL LINSB	G56	\$492,999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	Gila-North-Gila 69kV Rebuild Orchard	GLA/NGA	N/FGCL LINSB	G56	\$65,787	\$689,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	<b>G5600 TOTALS</b>				\$558,786	\$689,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	<b>LEVEE TOTALS</b>				\$1,558,786	\$689,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

FY18 - FY27 DESERT SOUTHWEST RRADs CAPITAL PROGRAM														
REF. NO.	PROJECT DESCRIPTION	LOCATION	BUDGET ACTIVITY	ORG	FY18 BUDGET ALLOCATIONS	FY19 BUDGET SUBMISSION	FY20 BUDGET SUBMISSION	FY21 BUDGET PLAN	FY22 BUDGET PLAN	FY23 BUDGET PLAN	FY24 BUDGET PLAN	FY25 BUDGET PLAN	FY26 BUDGET PLAN	FY27 BUDGET PLAN
<b>GGCS - SALINITY</b>														
1	Communication System Additions	SON	N/FGCS COMMB	G53	\$15,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	<b>G5300 TOTALS</b>				\$15,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	Sonora Wellfield Transformers	SON	N/FGCS SUBSB	G56	\$300,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	<b>G5600 TOTALS</b>				\$300,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	<b>SALINITY TOTALS</b>				\$315,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0





FY18 - FY27 DESERT SOUTHWEST RRADs CAPITAL PROGRAM

REF. NO.	PROJECT DESCRIPTION	LOCATION	BUDGET ACTIVITY	ORG	FY18 BUDGET ALLOCATIONS	FY19 BUDGET SUBMISSION	FY20 BUDGET SUBMISSION	FY21 BUDGET PLAN	FY22 BUDGET PLAN	FY23 BUDGET PLAN	FY24 BUDGET PLAN	FY25 BUDGET PLAN	FY26 BUDGET PLAN	FY27 BUDGET PLAN
<b>GGIN - INTERTIE</b>														
1	Test Equipment	MOVP	N/FGIN MOVPB	G52	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000
	<b>G5200 TOTALS</b>				\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000
<b>G53 - Communication Projects</b>														
2	WIN/CIP 7 Security Relay Encryption	MED/LIB/PPK	N/FGIN COMMB	G53	\$20,000	\$30,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	Power System Replacement - LIB0057B	LIB	N/FGIN COMMB	G53	\$15,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>G53 - Protection Projects</b>														
4	Relay Replacements - Transformer (KT1A)	MED	N/FGIN SUBSB	G53	\$330,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	Relay Replacements - Basler and Transformer (KU2A)	PCK	N/FGIN SUBSB	G53	\$40,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	PRC-002-2 DME Upgrades & Team Additions	MED	N/FGIN SUBSB	G53	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
7	Meter Replacement - Revenue & Panel	TBD	N/FGIN SUBSB	G53	\$0	\$55,072	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
8	Relay Replacements - Line/Transformer	TBD	N/FGIN SUBSB	G53	\$0	\$194,928	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
	<b>G5300 TOTALS</b>				\$505,000	\$380,000	\$350,000	\$350,000	\$350,000	\$350,000	\$350,000	\$350,000	\$350,000	\$350,000
9	Physical Security Upgrade	PCK	N/FGIN SUBSB	G56	\$210,348	\$520,000	\$250,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	230kv Breaker & Pad Replacements for LIB 182 & 1386 (TAM)	LIB	N/FGIN SUBSB	G56	\$1,200,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	Mead Substation Domestic Water Main Replacement	LIB	N/FGIN SUBSB	G56	\$0	\$100,000	\$1,025,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	<b>G5600 TOTALS</b>				\$1,410,348	\$620,000	\$1,275,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	Mead Phoenix 500kV Line	MED/PHX	N/FGIN LINSB	G61	\$350,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000
	<b>G6100 TOTALS</b>				\$350,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000
	<b>INTERTIE TOTALS</b>				\$2,305,348	\$2,540,000	\$3,165,000	\$1,890,000	\$1,890,000	\$1,890,000	\$1,890,000	\$1,890,000	\$1,890,000	\$1,890,000





FY18 - FY27 DESERT SOUTHWEST RRADs CAPITAL PROGRAM

REF. NO.	PROJECT DESCRIPTION	LOCATION	BUDGET ACTIVITY	ORG	FY18 BUDGET ALLOCATIONS	FY19 BUDGET SUBMISSION	FY20 BUDGET SUBMISSION	FY21 BUDGET PLAN	FY22 BUDGET PLAN	FY23 BUDGET PLAN	FY24 BUDGET PLAN	FY25 BUDGET PLAN	FY26 BUDGET PLAN	FY27 BUDGET PLAN
<b>GGPD - PARKER DAVIS</b>														
1	A2100 - Cyber Security	MOVP	N/FGPD MOVPB	A20	\$0	\$0	\$0	\$153,000	\$75,000	\$0	\$0	\$0	\$0	\$0
2	A2200 - Network	MOVP	N/FGPD MOVPB	A20	\$80,000	\$382,000	\$77,000	\$101,100	\$266,000	\$52,000	\$97,375	\$147,500	\$857,350	\$27,500
3	A2600 - Infrastructure	MOVP	N/FGPD MOVPB	A20	\$65,400	\$242,050	\$19,050	\$0	\$0	\$116,750	\$193,134	\$26,400	\$0	\$0
4	A2700 - SCADA (OSIsoft)	MOVP	N/FGPD MOVPB	A20	\$300,000	\$877,500	\$247,500	\$1,420,000	\$45,000	\$451,305	\$0	\$107,500	\$0	\$0
5	A2900 - Power Mngt & Mrkt	MOVP	N/FGPD MOVPB	A20	\$0	\$0	\$825,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	A2A00 - O&M Tech	MOVP	N/FGPD MOVPB	A20	\$0	\$0	\$500,000	\$100,000	\$0	\$0	\$0	\$0	\$0	\$0
<b>A2XXX TOTALS</b>					<b>\$445,400</b>	<b>\$1,501,550</b>	<b>\$1,668,550</b>	<b>\$1,774,100</b>	<b>\$386,000</b>	<b>\$620,055</b>	<b>\$290,509</b>	<b>\$281,400</b>	<b>\$857,350</b>	<b>\$27,500</b>
7	Chiller 1 Upgrade	PHS	N/FGPD SUBSB	G10	\$195,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	Covered Parking Lighting	PHS	N/FGPD SUBSB	G10	\$100,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	Roof Upgrade - Phoenix Main Facility Building	PHS	N/FGPD SUBSB	G10	\$138,700	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	Chillers SCADA	PHS	N/FGPD SUBSB	G10	\$133,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	DSW - Restroom Upgrades	PHS	N/FGPD SUBSB	G10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	DSW - Fire Alarms	PHS	N/FGPD SUBSB	G10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	HVAC Replacements (Electrician's Bldg)	PHS	N/FGPD SUBSB	G10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	Security Entryway (Design only in FY17)	PHS	N/FGPD SUBSB	G10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	Conference Rooms Rebuild (Design only in FY17)	PHS	N/FGPD SUBSB	G10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	Admin Suite Rebuild (Design only in FY17)	PHS	N/FGPD SUBSB	G10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	Break Rooms Rebuild (Design only in FY17)	PHS	N/FGPD SUBSB	G10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	Gate/Guard House (Design only in FY17)	PHS	N/FGPD SUBSB	G10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
19	Wash Bay (Design only in FY17)	PHS	N/FGPD SUBSB	G10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
20	Front Gate Replacement for Phoenix Facility	PHS	N/FGPD SUBSB	G10	\$0	\$250,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
21	Facility Project TBD	PHS	N/FGPD SUBSB	G10	\$0	\$0	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000
<b>G1000 TOTALS</b>					<b>\$566,700</b>	<b>\$250,000</b>	<b>\$500,000</b>	<b>\$500,000</b>	<b>\$500,000</b>	<b>\$500,000</b>	<b>\$500,000</b>	<b>\$500,000</b>	<b>\$500,000</b>	<b>\$500,000</b>
22	Replace PRS 230kV Breakers (286, 382)	PRS	N/FGPD SUBSB	G50	\$0	\$0	\$370,000	\$0	\$550,000	\$0	\$0	\$0	\$0	\$0
23	Replace PAD 230kV Breakers (586, 982)	PAD	N/FGPD SUBSB	G50	\$0	\$0	\$0	\$320,000	\$0	\$400,000	\$0	\$0	\$0	\$0
24	Replace RGS 230kV Breakers (1086, 682, 786)	RGS	N/FGPD SUBSB	G50	\$0	\$0	\$0	\$0	\$0	\$555,000	\$0	\$825,000	\$0	\$0
25	Replace RGS 230kV Breakers (882, 982)	RGS	N/FGPD SUBSB	G50	\$0	\$0	\$0	\$0	\$0	\$0	\$370,000	\$0	\$550,000	\$550,000
<b>G5000 TOTALS</b>					<b>\$0</b>	<b>\$0</b>	<b>\$370,000</b>	<b>\$320,000</b>	<b>\$550,000</b>	<b>\$955,000</b>	<b>\$370,000</b>	<b>\$825,000</b>	<b>\$550,000</b>	<b>\$550,000</b>





FY18 - FY27 DESERT SOUTHWEST RRADs CAPITAL PROGRAM

REF. NO.	PROJECT DESCRIPTION	LOCATION	BUDGET ACTIVITY	ORG	FY18 BUDGET ALLOCATIONS	FY19 BUDGET SUBMISSION	FY20 BUDGET SUBMISSION	FY21 BUDGET PLAN	FY22 BUDGET PLAN	FY23 BUDGET PLAN	FY24 BUDGET PLAN	FY25 BUDGET PLAN	FY26 BUDGET PLAN	FY27 BUDGET PLAN
GGPD - PARKER DAVIS CONTINUED...														
<b>ELECTRICIANS</b>														
26	Test Equipment	MOVVP	N/FGPD MOVVPB	G52	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000
27	DAVIS SUBSTATION MODIFICATIONS TO ADD SAFETY FENCE, REFLECTIVE MARKERS, GUARDRAILS, AND EROSION PROTECTION	DAD	N/FGPD SUBSB	G52	\$260,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
28	Replace ED2 115kV Breakers (1262, 1362)	ED2	N/FGPD SUBSB	G52	\$0	\$0	\$390,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
29	230kV Oil Breaker Replacement PAD 572 (TAM), purchase 2018, install 2019 (contingent upon construction PAD Rebuild project)	PAD	N/FGPD SUBSB	G52	\$0	\$175,000	\$205,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
30	230kV Oil Breaker Replacement PAD 772 (TAM), purchase 2018, install 2019 (contingent upon construction PAD Rebuild project) - Omitted from Oct 2015 sheet	PAD	N/FGPD SUBSB	G52	\$0	\$175,000	\$205,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
31	Replace ED2 115kV Breakers (1162, 1462)	ED2	N/FGPD SUBSB	G52	\$0	\$0	\$0	\$390,000	\$0	\$0	\$0	\$0	\$0	\$0
<b>LINEMEN</b>														
32	Wood Pole Program	GLAWMS	N/FGPD LINSB	G52	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000
33	SF6 Gas Cart	PHS	N/FGPD MOVVP1	G52	\$400,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
34	Dilo Dolly (2)	PHS	N/FGPD MOVVP1	G52	\$100,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
35	LowBoy Trailer	PHS	N/FGPD MOVVP1	G52	\$150,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
36	Aerial Lift(Genie or JLG)	PHS	N/FGPD MOVVP1	G52	\$300,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
37	6X4 Tractor	PHS	N/FGPD MOVVP1	G52	\$260,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
38	Oil filtration Trailer	PHS	N/FGPD MOVVP1	G52	\$120,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
39	UTV (2-each)	PHS	N/FGPD MOVVP1	G52	\$30,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
40	Bucket Truck 40 ft (2-each)	PHS	N/FGPD MOVVP1	G52	\$0	\$150,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
41	Bare Hand Bucket Truck 125ft	PHS	N/FGPD MOVVP1	G52	\$0	\$800,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
42	Bull Dozer	PHS	N/FGPD MOVVP1	G52	\$0	\$380,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
43	Caterpillar D6	PHS	N/FGPD MOVVP1	G52	\$0	\$0	\$360,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
44	(3) Elliot Squirt Boom	PHS	N/FGPD MOVVP1	G52	\$0	\$0	\$500,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
45	Self Loader 6X6	PHS	N/FGPD MOVVP1	G52	\$0	\$0	\$280,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
46	(3) F550 Lineman trucks	PHS	N/FGPD MOVVP1	G52	\$0	\$0	\$400,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
47	200' Barehand Bucket	PHS	N/FGPD MOVVP1	G52	\$0	\$0	\$0	\$2,300,000	\$0	\$0	\$0	\$0	\$0	\$0
48	MOVVP - TBD	PHS	N/FGPD MOVVP1	G52	\$0	\$0	\$0	\$0	\$1,000,000	\$950,000	\$900,000	\$900,000	\$900,000	\$900,000
<b>G5200 TOTALS</b>					<b>\$4,740,000</b>	<b>\$4,800,000</b>	<b>\$5,460,000</b>	<b>\$5,810,000</b>	<b>\$4,120,000</b>	<b>\$4,070,000</b>	<b>\$4,020,000</b>	<b>\$4,020,000</b>	<b>\$4,020,000</b>	<b>\$4,020,000</b>





FY18 - FY27 DESERT SOUTHWEST RRADs CAPITAL PROGRAM

REF. NO.	PROJECT DESCRIPTION	LOCATION	BUDGET ACTIVITY	ORG	FY18 BUDGET ALLOCATIONS	FY19 BUDGET SUBMISSION	FY20 BUDGET SUBMISSION	FY21 BUDGET PLAN	FY22 BUDGET PLAN	FY23 BUDGET PLAN	FY24 BUDGET PLAN	FY25 BUDGET PLAN	FY26 BUDGET PLAN	FY27 BUDGET PLAN
<b>GGPD - PARKER DAVIS CONTINUED...</b>														
<b>G53 - Communication Projects</b>														
49	DACs Replacements	CTP/MED	N/FGPD COMMB	G53	\$0	\$237,524	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
50	Power System Replacement (Microwave Bldg Batteries)	PHS	N/FGPD COMMB	G53	\$140,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
51	Optical Mux Replacements (FOP)	FOP	N/FGPD COMMB	G53	\$25,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
52	RTU Replacements	TBD	N/FGPD COMMB	G53	\$53,000	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000
53	WIN/CIP	MULTI-SITES	N/FGPD SUBSB	G53	\$90,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
54	Optical Mux Replacements (CUN0003B)(JUS)	CUN	N/FGPD COMMB	G53	\$20,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
55	Radio Replacements (JUS)	JUS	N/FGPD COMMB	G53	\$20,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000
56	Comm Site Building Replacement	PSP	N/FGPD COMMB	G53	\$0	\$83,537	\$100,000	\$75,000	\$1,000,000	\$0	\$0	\$0	\$0	\$0
57	Power System Replacement (Comm Center Batteries)	PHS	N/FGPD COMMB	G53	\$0	\$38,938	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
58	Power System Replacement	TBD	N/FGPD COMMB	G53	\$0	\$0	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000
59	OPGW - Installation (In Study Phase)	LAD-IMPERIAL	N/FGPD COMMB	G53	\$0	\$0	\$0	\$0	\$0	\$880,000	\$880,000	\$880,000	\$880,000	\$880,000
<b>G53 - Protection Projects</b>														
60	Test Equipment	MOVP	N/FGPD MOVP1	G53	\$406,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
61	Wellton Mohawk Pumping Plant Upgrades	WM1 AND WM3	N/FGPD SUBSB	G53	\$43,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
62	Relay Replacements - Line	HEN/MED	N/FGPD SUBSB	G53	\$50,000	\$124,363	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
63	Relay Replacements - Line	HEN/MED	N/FGPD SUBSB	G53	\$50,000	\$422,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
64	Relay Replacements - Line	PHX/LIB	N/FGPD SUBSB	G53	\$33,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
65	Relay Replacements - Line	PHX/LIB	N/FGPD SUBSB	G53	\$25,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
66	Meter Program	PHS	N/FGPD SUBSB	G53	\$25,000	\$110,637	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
67	PRC-002-2 DME Upgrades & Team Additions	TBD	N/FGPD SUBSB	G53	\$25,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
68	"MED D" - Basler Relay Replacements	MED	N/FGPD SUBSB	G53	\$40,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
69	Relay Replacements - Line/Transformer	TBD	N/FGPD SUBSB	G53	\$0	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
<b>G5300 TOTALS</b>					<b>\$1,045,000</b>	<b>\$1,787,000</b>	<b>\$1,005,000</b>	<b>\$980,000</b>	<b>\$1,905,000</b>	<b>\$1,785,000</b>	<b>\$1,785,000</b>	<b>\$1,785,000</b>	<b>\$1,785,000</b>	<b>\$1,785,000</b>
70	Physical Security Upgrade	PCK/GLA/TUC/TTT	N/FGPD SUBSB	G56	\$150,000	\$2,080,000	\$1,076,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
71	UPS Project	PHX	N/FGPD SUBSB	G56	\$268,064	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>G5600 TOTALS</b>					<b>\$418,064</b>	<b>\$2,080,000</b>	<b>\$1,076,000</b>	<b>\$0</b>						
72	Federal Hydropower Mgt Tool	PHX	N/FGPD SUBSB	G56	\$840,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>G6100 TOTALS</b>					<b>\$840,000</b>	<b>\$2,080,000</b>	<b>\$1,076,000</b>	<b>\$0</b>						
<b>PARKER DAVIS TOTALS</b>					<b>\$8,055,164</b>	<b>\$10,418,550</b>	<b>\$10,079,550</b>	<b>\$9,384,100</b>	<b>\$7,461,000</b>	<b>\$7,930,055</b>	<b>\$6,965,509</b>	<b>\$7,411,400</b>	<b>\$7,712,350</b>	<b>\$6,882,500</b>
<b>GRAND TOTALS</b>					<b>\$32,874,576</b>	<b>\$25,844,550</b>	<b>\$19,664,550</b>	<b>\$19,483,100</b>	<b>\$16,026,000</b>	<b>\$13,565,055</b>	<b>\$11,575,509</b>	<b>\$11,596,400</b>	<b>\$12,877,350</b>	<b>\$12,047,500</b>





TABLE OF DISTRIBUTION BY ORG			ORG	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27
			A20	\$445,400	\$1,501,550	\$1,668,550	\$1,774,100	\$386,000	\$620,055	\$290,509	\$281,400	\$857,350	\$27,500
			G10	\$566,700	\$250,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000
			G50	\$550,000	\$1,000,000	\$370,000	\$1,470,000	\$2,150,000	\$3,205,000	\$1,595,000	\$1,625,000	\$2,330,000	\$2,330,000
			G52	\$6,220,000	\$4,900,000	\$5,960,000	\$6,310,000	\$4,620,000	\$4,570,000	\$4,520,000	\$4,520,000	\$4,520,000	\$4,520,000
			G53	\$3,476,000	\$3,527,000	\$3,910,000	\$3,315,000	\$3,290,000	\$3,170,000	\$3,170,000	\$3,170,000	\$3,170,000	\$3,170,000
			G56	\$21,266,476	\$13,166,000	\$5,756,000	\$4,614,000	\$3,580,000	\$0	\$0	\$0	\$0	\$0
			G61	\$350,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000
				\$ 32,874,576	\$ 25,844,550	\$ 19,664,550	\$ 19,483,100	\$ 16,026,000	\$ 13,565,055	\$ 11,575,509	\$ 11,596,400	\$ 12,877,350	\$ 12,047,500

TABLE OF DISTRIBUTION BY POWER SYSTEM			POWER SYSTEM	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27
			GGBC	\$350,000	\$400,000	\$600,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000
			GGCA	\$11,044,500	\$800,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000
			GGCL	\$1,558,786	\$689,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
			GGCR	\$9,245,778	\$10,997,000	\$5,420,000	\$7,409,000	\$5,875,000	\$2,945,000	\$1,920,000	\$1,495,000	\$2,475,000	\$2,475,000
			GGCS	\$315,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
			GGIN	\$2,305,348	\$2,540,000	\$3,165,000	\$1,890,000	\$1,890,000	\$1,890,000	\$1,890,000	\$1,890,000	\$1,890,000	\$1,890,000
			GGPD	\$8,055,164	\$10,418,550	\$10,079,550	\$9,384,100	\$7,461,000	\$7,930,055	\$6,965,509	\$7,411,400	\$7,712,350	\$6,882,500
				\$ 32,874,576	\$ 25,844,550	\$ 19,664,550	\$ 19,483,100	\$ 16,026,000	\$ 13,565,055	\$ 11,575,509	\$ 11,596,400	\$ 12,877,350	\$ 12,047,500





## 7. PIVOT STRATEGY 2018

### 7.1 What Is The Pivot?

A onetime shift in the 10-Year Plan process that requires simultaneous approval of upcoming capital improvement projects. This simultaneous approval encompasses new project starts for Fiscal Years 2019, 2020 and 2021. The plan to pivot will conclude in December 2018 at the Prepayment Voting Meeting. Upon Completion of this Pivot, the Ten Year Plan will be in alignment with the Government's Budget Formulation Process.

### 7.2 Why Do We Need to Pivot?

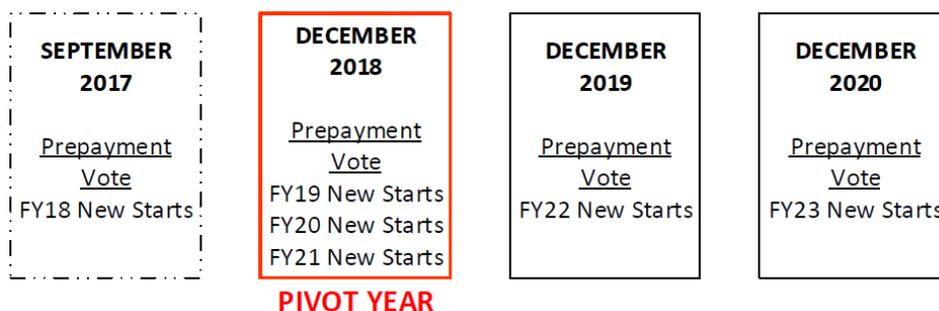
Federal Government Budget Formulation process begins two fiscal years prior to the execution fiscal year. Having the Prepayment funding vote occur on projects during the current Fiscal Year creates inconsistencies and issues with the execution of DSW's active budget. Modifications to resource allocation are made last minute, in order to compensate for any budgetary deviations. By aligning the customer Prepayment Vote with the Budget Formulation process, DSW can maintain consistency and predictability in its Budget Formulation and Execution. Aligning capital planning with budget formulation is imperative to the success of DSW.

### 7.3 Customer Benefits

The "Ten Year Plan Pivot" is a pathway that has been identified by WAPA to allow a shift in the 10-Year Plan to better align with the Budget Formulation Process. As a result of this transition, the Customers will gain direct input into AOA study planning and results. Previously the AOAs were being performed concurrent with Budget Formulation, so opportunities for customer input/engagement were limited. To achieve WAPA's objective in providing customers with capital planning information early and often, the plan to pivot is the pathway to that goal.

### 7.4 Objectives to Execute the Pivot

- All new projects for fiscal year 2019, 2020, and 2021 must be reviewed by the customer group
  - The body of work for these three years includes two large scale transmission line rebuild projects
- The preferred alternative (scope) for each new start must be vetted and agreed upon by customers
- WAPA must move forward on the preferred alternatives for FY19, FY20, and FY21 to maintain the current budget through FY20
- Receive customer's approval on prepayment funding for all three fiscal years





DECEMBER 2018 PROJECTED PREPAYMENT VOTE (PIVOT YEAR)											
Start	Project	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	PCN Total	Project Total
FY18	Coolidge-Valley Farms 115kV Rebuild	\$ 800	\$ 2,673	\$ 1,138	\$ 205					\$ 4,816	\$ 4,816
FY18	Kofa-Dome Tap 161kV Rebuild	\$ 500	\$ 4,630	\$ 500						\$ 5,130	\$ 5,630
FY18	Dome-Gila 161kV Rebuild	\$ 500	\$ 5,951	\$ 950						\$ 6,901	\$ 7,401
FY19	Bouse-Kofa 161kV Rebuild Ph:I		\$ 465	\$ 6,376	\$ 7,620	\$ 778	\$ 311			\$ 15,085	\$ 15,550
FY19	Bouse-Kofa 161kV Rebuild Ph:II		\$ 465	\$ 6,376	\$ 7,620	\$ 778	\$ 311			\$ 15,085	\$ 15,550
FY20	Parker-Blythe 161kV Rebuild Ph: I			\$ 500	\$12,779	\$ 6,385	\$ 236	\$ 100		\$ 19,500	\$ 20,000
Fy21	Parker-Blythe 161kV Rebuild Ph: II				\$ 500	\$12,779	\$ 6,385	\$ 236	\$100	\$ 19,500	\$ 20,000
			<b>\$14,184</b>	<b>\$15,840</b>	<b>\$28,724</b>	<b>\$20,720</b>	<b>\$ 7,243</b>	<b>\$ 336</b>	<b>\$100</b>	<b>\$ 86,017</b>	<b>\$ 88,947</b>

DECEMBER 2019 PROJECTED PREPAYMENT VOTE											
Start	Project	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	PCN Total	Project Total
FY22	Parker-Blythe 161kV Rebuild Ph: III	\$ 500	\$12,779	\$ 6,385	\$ 236	\$ 100				\$ 19,500	\$ 20,000
FY22	TBD										
		<b>\$ 500</b>	<b>\$12,779</b>	<b>\$ 6,385</b>	<b>\$ 236</b>	<b>\$ 100</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 19,500</b>	

DECEMBER 2020 PROJECTED PREPAYMENT VOTE											
Start	Project	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	PCN Total	Project Total
FY23	Blythe-Headgate Rock 161kV Rebuild	\$ 717	\$ 9,799	\$11,711	\$ 1,195	\$ 478				\$ 23,183	\$ 23,900
FY23	TBD										
		<b>\$ 717</b>	<b>\$ 9,799</b>	<b>\$11,711</b>	<b>\$ 1,195</b>	<b>\$ 478</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 23,183</b>	

Figure 15- Estimates are in 1,000s



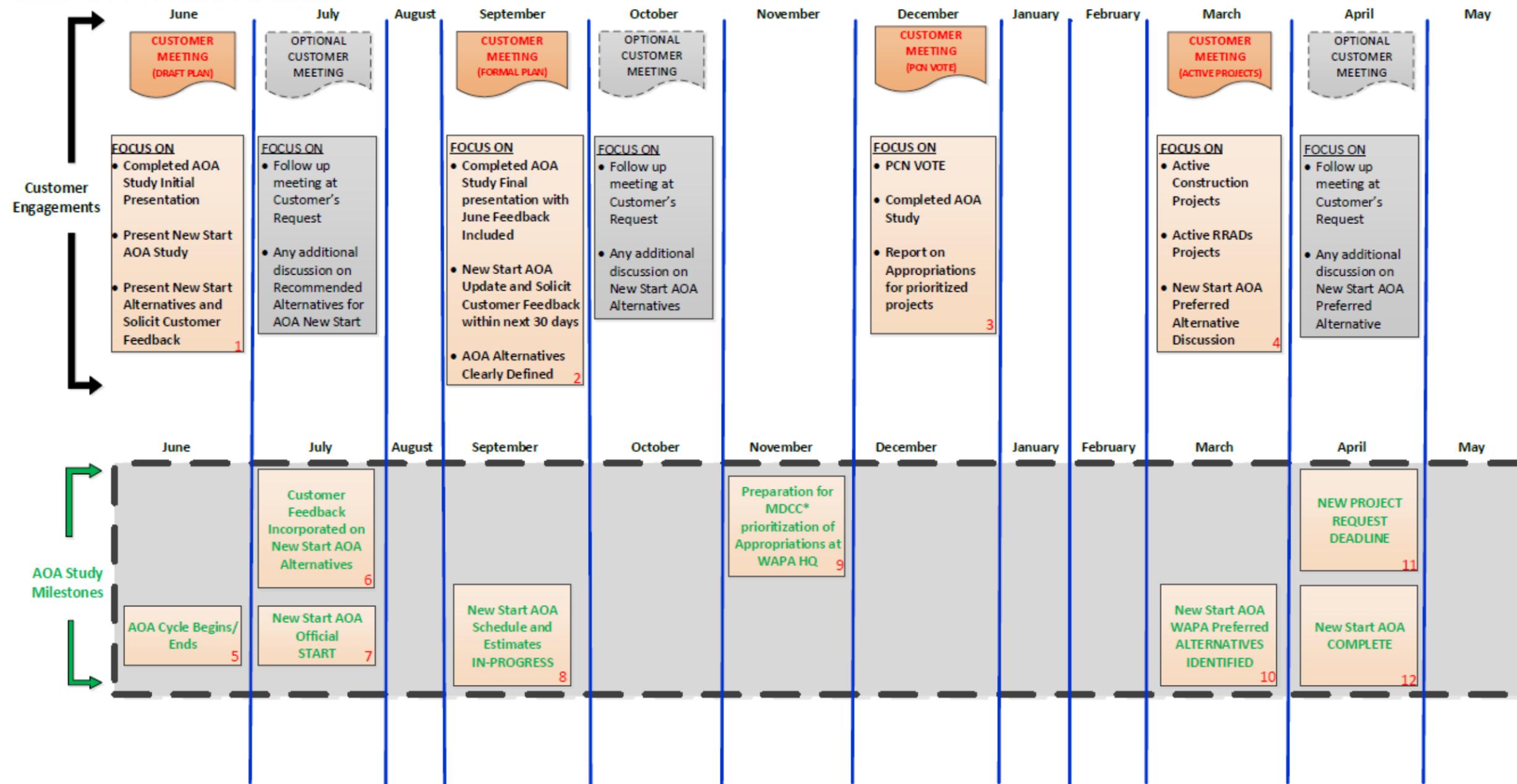


7.5 How Will the 10-Year Plan Program Look After The Pivot?



### DSW 10-Year Capital Plan Integrated AOA Study Cycle

**LEGEND**  
Red – Customer CORE Meeting  
Green – Milestones/Internal



\*MDCC – Maintenance Design Construction Committee.

Figure 16 Final TYP Meeting Schedule





## 8. SEED FUNDING UPDATE

### 8.1 FY18 Seed Funded Projects

In August of 2017 DSW presented proposed projects for fiscal 2018 which included Kofa-Dome Tap 161kV and Dome Tap-Gila 161kV rebuilds. These transmission line Projects were selected for Seed Funding using appropriations (WCF). Seed Funding provides a not-to-exceed allowance to begin the design phase with the objective of reaching >50% design package and a revalidated project budget for customer review in the fall of 2018.

FY2018 SEED FUNDING PLAN				
PROJECT	CONCEPTUAL PROJECT COST	APPROPRIATED SEED FUNDS FY2018	PREPAYMENT SEED FUNDS FY2018	PREPAYMENT FUNDS REQUEST FY2019
Kofa-Dome Tap Rebuild	\$5,360,022	~\$500,000	\$0	TBD Fall 2018
Dome Tap-Gila Rebuild	\$7,401,431	~\$500,000	\$0	TBD Fall 2018
Coolidge Valley Farms	\$4,815,696	\$0	~\$800,000	TBD Fall 2018
<b>TOTAL</b>	<b>\$12,761,453</b>	<b>~\$1,000,000</b>	<b>\$800,000</b>	<b>TBD Fall 2018</b>

### 8.2 Current Status of Continuing Resolution

As of March 23<sup>rd</sup>, 2018 congress passed an approved budget. Appropriations are currently transferring from DOE to WAPA HQ. Upon receipt the funds will be distributed to all regions. Both Kofa-Dome Tap and Dome Tap- Gila transmission lines have begun the formal design process in preparation for the September meeting to share the re-validated estimates at a >50% approval.

### 8.3 Seed Funding Project Delays

The primary output of the Seed Funding phase is a partial project design package (>50% complete) and revalidation of the rough order magnitude project estimate from the AOA study phase. The project design package consists of the construction specifications, drawings, and associated procurement documents. The revalidated project cost estimate is derived from progressive elaboration of the project scope from the AOA study to the >50% design milestone.

WAPA estimates that approximately six months is required to develop the >50% of the design package and revalidated project cost estimate. Due to the extended CR, there is a potential delay in the development of the partial design package, which would have an adverse effect on WAPA's 10-Year Plan. However, WAPA's Construction group is currently on track to meet the partial design deadline required for the December vote.





## 9. FY19 PROPOSED PROJECT: BOUSE-KOFA REBUILD

### 9.1 Project Description

Bouse (BSE) to Kofa (KOF) is a single circuit, 84.3 mile, 161-kV transmission line segment of the overall Parker-Gila 161-kV Transmission Line originally built in 1943.

The BSE-KOF line is located in western Arizona running south from Bouse substation to Kofa substation. Bouse substation is located just north of the junction of AZ Highways 72 and 95 in La Paz county. Kofa substation is located approximately 16 miles northeast of the city of Yuma in Yuma County. The terrain along the line is mostly low desert with multiple wash crossings and low rises. Toward the south end of the transmission line the terrain becomes more mountainous across the Castle Dome Mountains near Dome Tap.

The line was originally 78.9 miles long, constructed with three 300 kcmil hollow core copper conductors (Anaconda R178R2). Most of the wood H-Frame structures have been replaced with light duty steel H-Frame structures, and only 82 wood structures remain. In 2006 a portion of the line was rerouted around the town of Quartzsite. The reroute replaced 3.3 miles of the existing line through Quartzsite with 8.4 miles of three 954 kcmil ACSR conductors supported on single circuit steel monopoles.



*Figure 17 Bouse-Kofa Existing Wood H-Frame Structure February 2018*





## 9.2 Project Justification

This AOA identifies various gaps/deficiencies associated with this line and five possible alternatives to addressing this issue.

Experienced and/or Observed Issues:

- NERC/NESC violations have been identified and need to be corrected
- Noted deterioration and unsafe structures are significant
- Access road(s) and right-of-way availability and conditions are sub-par
- Install fiber optic ground wire to meet current and future protection, control, communication and security requirements

### **NERC/NESC Violations:**

NERC requires all transmission line owners/operators to perform a Facility Rating Analysis of all transmission lines over 100-kV in order to determine the as-built condition and de-rate the line to that condition, or to mitigate the condition to achieve the design rating.

There are 106 cases of phase-to-ground clearances and one phase-to-OGW of a crossing line clearance not meeting the minimum clearance required by the National Electrical Safety Code (NESC) and NERC.

### **Transmission Line Conditions:**

There are 17 structures identified by maintenances forces as needing replacement with more expected when detailed ground inspection is completed.



*Figure 18 Bouse-Kofa Existing Wood H-Frame Structure February 2018*



**Access Roads and ROW:**

According to maintenance field inspection reports, there are numerous cases of access roads and right-of-way paths requiring improvement to facilitate construction and maintenance activities. In some cases access roads need to be created. A lack of prompt access for appropriate resources presents reliability, safety, and cost risks.

**Communications Requirements:**

Installing Optical Overhead Ground Wire (OPGW) provides an alternate and physically independent path for protection, control and communication. Currently microwave provides the only communication path and the addition of an OPGW will allow for the future communication bandwidth needs to be met. Those needs include security which is currently in the process of installing live feed video cameras and IT networks at substations; the addition of these systems will tax and soon bypass the current communications bandwidth provided by microwave.





Geographic Information System

## February 20, 2018 BSE-KOF 161kV G5200 Maintenance Report

### Maintenance Performed in 2018

	Anchor	Brace	Crossarm	Foundation	Guy	Insulator	Phase/Conductor	Pole	Pole Hardware	Signs	Static Wire	TOTALS
Adjusted/Modified												0
Repaired			1			1					8	10
Replaced							1				1	2
<b>TOTALS</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>12</b>

Note: Totals include RADDs projects and maintenance items.

2018 Inspection Progress

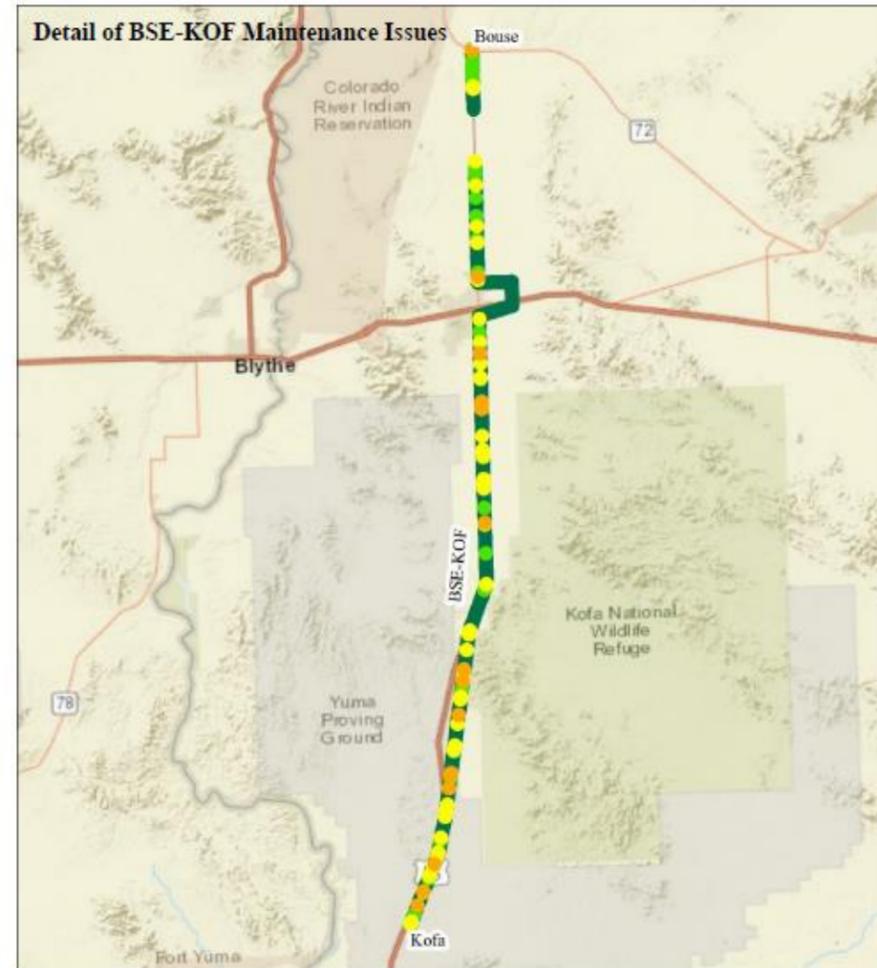
	Structures
Inspected	588
Uninspected	81
<b>Total</b>	<b>669</b>
<b>88%</b>	

### Outstanding Maintenance in 2018

Row Labels	C	D	E	Grand Total
Anchor				0
Brace	38	2		40
Crossarm	21	6		27
Guy	6			6
Insulator	26			26
Phase/Conductor				0
Pole	36	5		41
Pole Hardware	7			7
Signs	2			2
Static Wire	4	4		8
Vibration Damper				0
<b>Grand Total</b>	<b>140</b>	<b>17</b>	<b>0</b>	<b>157</b>

Maintenance Priority Codes

<b>A</b>	Good or like new. No action required.
<b>B</b>	Minor defect. Monitor degradation.
<b>C</b>	Moderate defect. Rehabilitation or replacement recommended as scheduled maintenance.
<b>D</b>	Serious defect. Repair, reinforce, or replace as soon as possible.
<b>E</b>	Risk to public safety or system reliability.





## 9.4 Proposed Alternatives Overview and Selection

There were a total of five alternatives that were explored to provide a diverse range of viable, economically feasible design options. The feasibility/value of these Alternatives was explored in regards to Compliance, Reliability and Economy. A detailed breakdown of each Alternative can be found below

- Alternative 1- Status Quo (Maintenance only)
- Alternative 2- Reconductor and Replace failing wood poles in-kind
- Alternative 3- Reconductor and Replace all wood poles with light duty steel H-frame structures
- Alternative 4- Rebuild to 230-kV Standards operated at 161kV using light duty steel H-Frame structures
- Alternative 5- Inset Structures as needed to mitigate NERC/NESC violations

### Alternative #1- Status Quo (Maintenance Only)

Under the no action alternative, the BSE-KOF T-line continues in its present condition with 107 NERC/NESC violations. WAPA maintenance forces would continue to replace failed wood poles with new wood poles upon failure pending resource availability.

The status quo alternative would have no upfront construction costs, but to change out the remaining wood structures on an emergency maintenance basis could cost \$5,948,000. This estimate is based on an actual pole replacements at a cost of \$34,176.93. This scenario would leave 82 wood structures in the line. A detailed ground inspection which is still in progress for the current maintenance year has identified 17 structures that have poles that have been rejected or are recommended to be replaced. More structures are expected to be recommended for replacement when the detailed ground inspection of this line is completed.

### Alternative #2- Reconductor BSE-KOF

WAPA will replace 75.6 miles of three 300 kcmil Anaconda hollow core copper conductors with three 336.4 kcmil Oriole ACSS conductors, replacing one steel OGW with OPGW, and replacing 17 wood structures deemed as requiring replacement with light duty steel H-frame structures and others as needed to correct clearance issues not corrected by the stringing new ACSS conductor. Access roads will be improved as needed.

### Alternative #3- Rebuild with Light Duty Steel H-Frame Structures

WAPA will replace 75.6 miles of three 300 kcmil Anaconda hollow core copper conductors with three 336.4 kcmil Oriole ACSS conductors, replace one steel OGW with OPGW, and install light duty steel H-frame structures to replace the 82 wood structures left in the line segment. Install new light duty steel H-frame steel structures as needed to correct clearance issues not corrected by stringing new ACSS conductor. Access roads will be improved as needed to facilitate construction.

### Alternative #4- Rebuild to 230-kV Standards

WAPA will remove 75.6 miles of three 300 kcmil hollow core copper conductor, two steel OGWs, 584 light duty steel H-Frame structures, and 82 wood H-Frame wood structures. WAPA will then rebuild the line segment by installing 75.6 miles of three 954 kcmil ACSR conductor, OPGW, polymer insulators, and hardware designed for 230kV on single circuit steel monopoles but being operated at 161kV. Access roads will be improved as needed.





**Alternative #5- Inset Structures**

Description of Alternative 5 – WAPA will inset 107 light duty steel H-frame structures between existing transmission line structures as necessary to correct clearance issues. Access roads will be improved as necessary for construction.

**9.5 Alternative Comparisons**

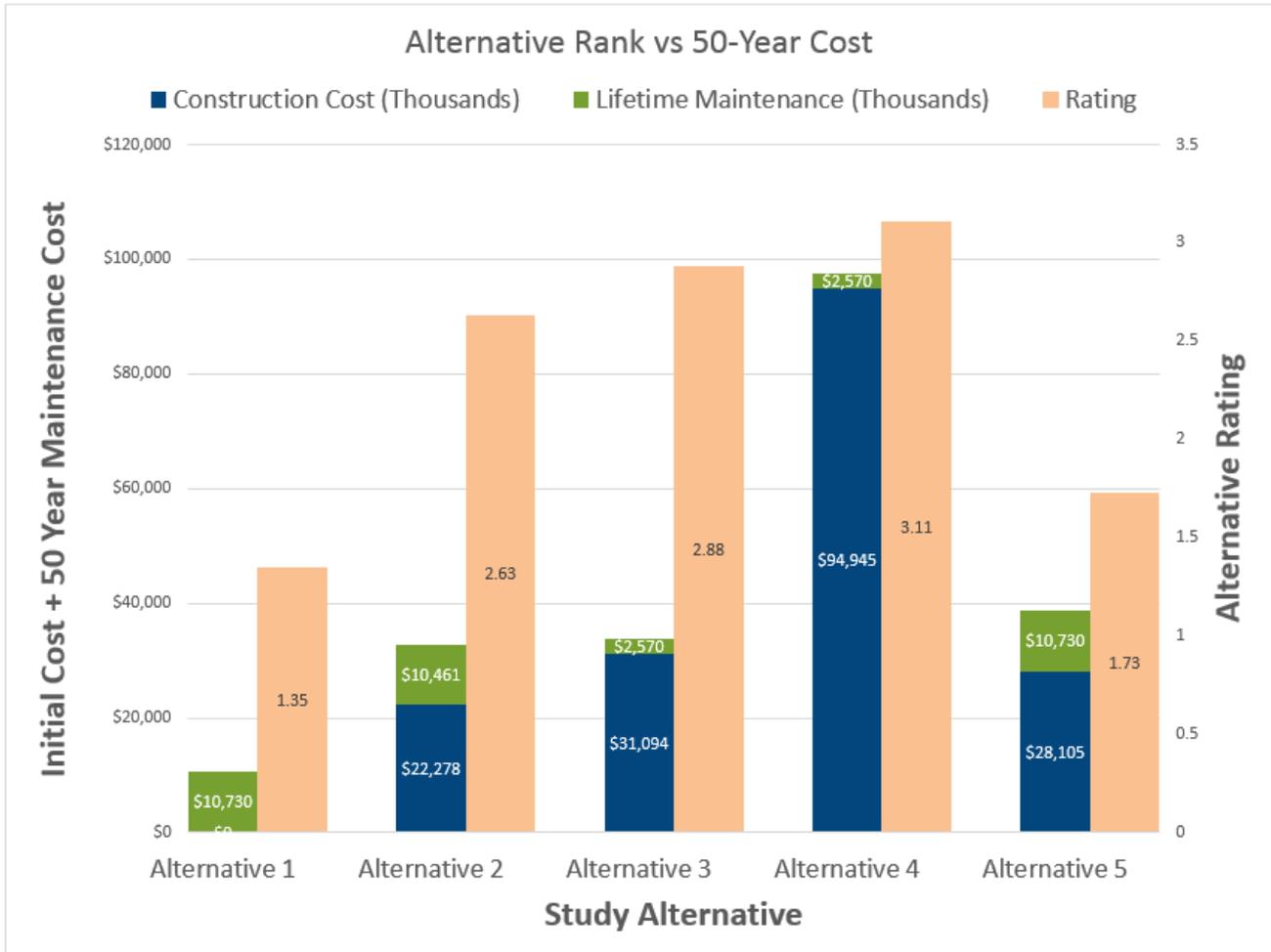


Figure 19 Breakdown of AOA Rating and Costs for BSE-KOF





## 9.6 Preferred Alternative

Of these Alternatives, WAPA has concluded that Alternative 3 is preferred. Although Alternative 4 achieved a higher AOA Rating, the cost required to achieve that rating is far greater than Alternative 4. This fact is illustrated in Figure 5 “Breakdown of AOA Rating and Costs for BSE-KOF”.

### **Project Predesign Estimate for Preferred Alternative (Alternative 3 Conceptual)**

<b>Preferred Alternative #3 Conceptual Estimate</b>	
<b>Rebuild With Light Duty Steel H-Frame Structures</b>	
	<b>TOTAL</b>
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
<b>Subtotal</b>	<b>\$25,912,000</b>
Contingency (20%)	\$5,182,000
<b>Phase I &amp; II Total Project Budget</b>	<b>\$31,094,000</b>

\*Earned Value Management System (EVMS) is a project management system required by the Department of Energy to manage cost and schedule on projects having a Total Project Cost (TPC) over \$20 million

\*\*OPGW is 2.9% of Total Project Cost.





### 9.7 Conceptual Project Phasing



Figure 20 Bouse-Kofa Phasing Breakdown





### **Phase I**

Design and construct 31.25 miles of 161-kV transmission line from structure 70-2 to Kofa Substation. Design includes replacing 43 wood structures, and selecting a new conductor that can be installed on existing and new light duty steel H-Frame structures to eliminate NERC/NESC violations to the extent possible. It is anticipated some existing light duty steel H-Frame structures will be replaced with taller structures. Design should include installing steel dead-end structures every 5 to 10 miles to prevent cascading failure.

### **Phase II**

Design and construct 44.25 miles of 161-kV transmission line from Bouse Substation to structure 70-2. Design includes replacing 40 wood structures, and selecting a new conductor that can be installed on existing and new light duty steel H-Frame structures to eliminate NERC/NESC violations to the extent possible. It is anticipated some existing light duty steel H-Frame structures will be replaced with taller structures. Design should include installing steel dead-end structures every 5 to 10 miles to prevent cascading failure.

### **Advantages:**

- Each phase can be scheduled around summer outage restrictions.
- Project can be completed faster with more manageable outages considering more work can be performed between outage restrictions.
- The terrain on the southern end of the line is much more mountainous and difficult than the north. Phasing allows a multiple contractor crews to focus on terrain specific locations concurrently.
- Environmental clearance for both phases can be obtained simultaneously.
- All GFE for both phases can be ordered at the same time with deliveries scheduled as needed by each phase.

### **Disadvantages:**

- Two sets of specifications and drawings will be needed, a separate set for each phase.
- A separate construction contract would be needed for each phase.

### **Project Assumptions & Constraints**

- No new ROW would be needed except for temporary construction permits.
- No line outages are allowed between May 1 and Oct 1 in any given year.
- Cost estimate is conceptual and must be revised before establishing a construction project budget.
- Salvage value of retired copper wire was estimated at \$1.55 per pound (market value at time of AOA).
- The project may be done in phases.
- Others have expressed interest in sharing fibers and costs of OPGW. Evaluations have been done in accordance with Federal laws and regulations.
- Detailed engineering of this project has not been started; all estimates and scheduling are based on discussions and proper charging estimates between Civil Design & Engineering (CD&E) and WAPA and do not guarantee that actual schedules and final cost will not vary from those projected.





## 10. FY20-21 PROPOSED PROJECT: BLYTHE-PARKER REBUILD

### 10.1 Project Description

The Blythe(BLY) to Parker (PAD) 161-kV Transmission Line was built in 1969 and runs along the Colorado River in eastern California. The transmission line is 63.9 miles long utilizing 954 kcmil ACSR conductor and two steel overhead ground wires supported on wooden H-frame structures with 3-pole wooden structures at angle points and dead-ends. The transmission line is part of the Parker-Davis Project.

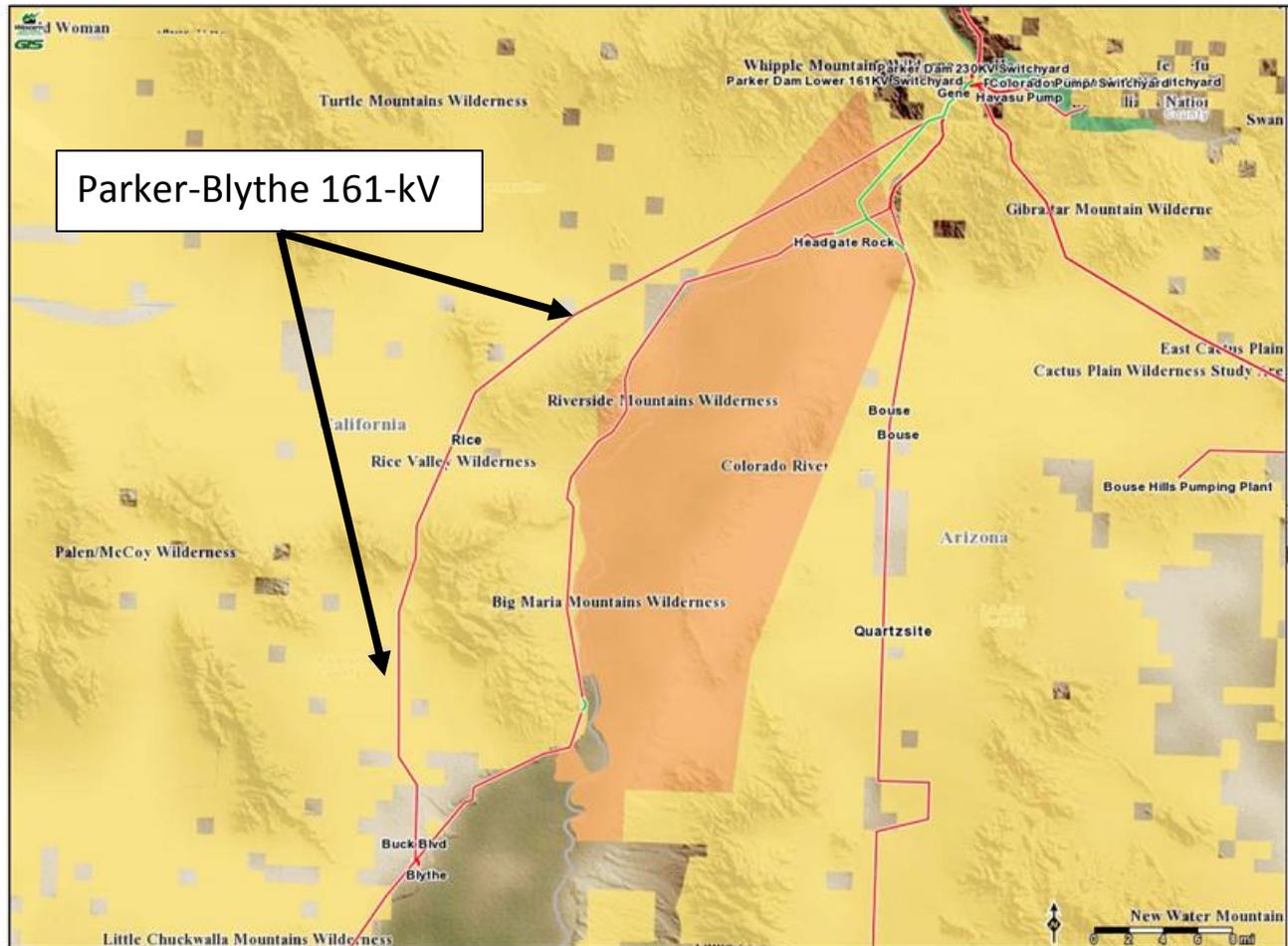


Figure 21 Parker-Blythe #2 Area Map





## 10.2 Project Justification

The PAD-BLY 161-kV Transmission Line is 49 years old and supported on wood H-Frame structures that have exhibited deterioration and are in need of rehabilitation. Eighty percent of the wood poles in the PAD-BLY line have been identified as needing replacing.

Rehabilitation of the PAD-BLY 161-kV Transmission line is needed to insure the safe, secure, reliable and affordable energy and transmission services to our customers. Rehabilitation would include:

- Replace all unsafe and deteriorated structures including those that were found to have test results with fiber strength that fell below 65% of their design strength.
- Install dead-ends at intervals of less than 10 miles to prevent cascading failures.
- Correct all NERC/NESC violations that have been identified.
- Repair access roads as needed to construct this project.
- Install fiber optic ground wire to meet current and future protection, control, communication and security requirement.
- NERC/NESC violations have been identified and need to be corrected.
- Noted deterioration and unsafe structures are significant.
- Access road(s) and Right-Of-Way availability and conditions are sub-par .
- Additional communication requirements have been identified.

### **NERC/NESC Violations:**

There are five cases of phase-to-ground clearances not meeting the minimum clearance required by the NESC and NERC that need to be corrected.

### **Line Condition:**

The PAD-BLY transmission line is 49 years old and has eighty percent of its supporting structures needing replacing as identified by detailed ground inspection and Polux® wood fiber strength testing.



*Figure 22 Signs of significant pole degradation and heat rot*



**Access Roads and ROW:**

GIS data and inspection field reports shows that much of the ROW access road is so sandy, eroded or steep that construction vehicles and equipment will need to be towed in by dozer. A detailed ground inspection of the PAD-BLY transmission line conducted by DSW maintenance group identified 20% of the structures (103 out of 523) as needing a dozer tow for access to structures.

**Communication Requirements:**

The PAD-BLY transmission line does not have OPGW installed. OPGW has the added benefit of drastically increasing total bandwidth for data transfer over Power Line Carrier or Point to Point Microwave Systems. Security is currently in the process of installing live feed video cameras and IT networks at substations. The addition of these systems will tax or bypass the current communications bandwidth provided by the existing communication networks in place.





10.3 Parker-Blythe Maintenance Report



Geographic Information System

## February 20, 2018 PAD-BLY-2 161kV G5200 Maintenance Report

### Maintenance Performed in 2018

	Anchor	Brace	Crossarm	Foundation	Guy	Insulator	Phase/Conductor	Pole	Pole Hardware	Signs	Static Wire	TOTALS
Adjusted/Modified												0
Repaired												0
Replaced												0
<b>TOTALS</b>	0	0	0	0	0	0	0	0	0	0	0	0

Note: Totals include RADDs projects and maintenance items.

2018 Inspection Progress

	Structures
Inspected	4
Uninspected	522
<b>Total</b>	<b>526</b>

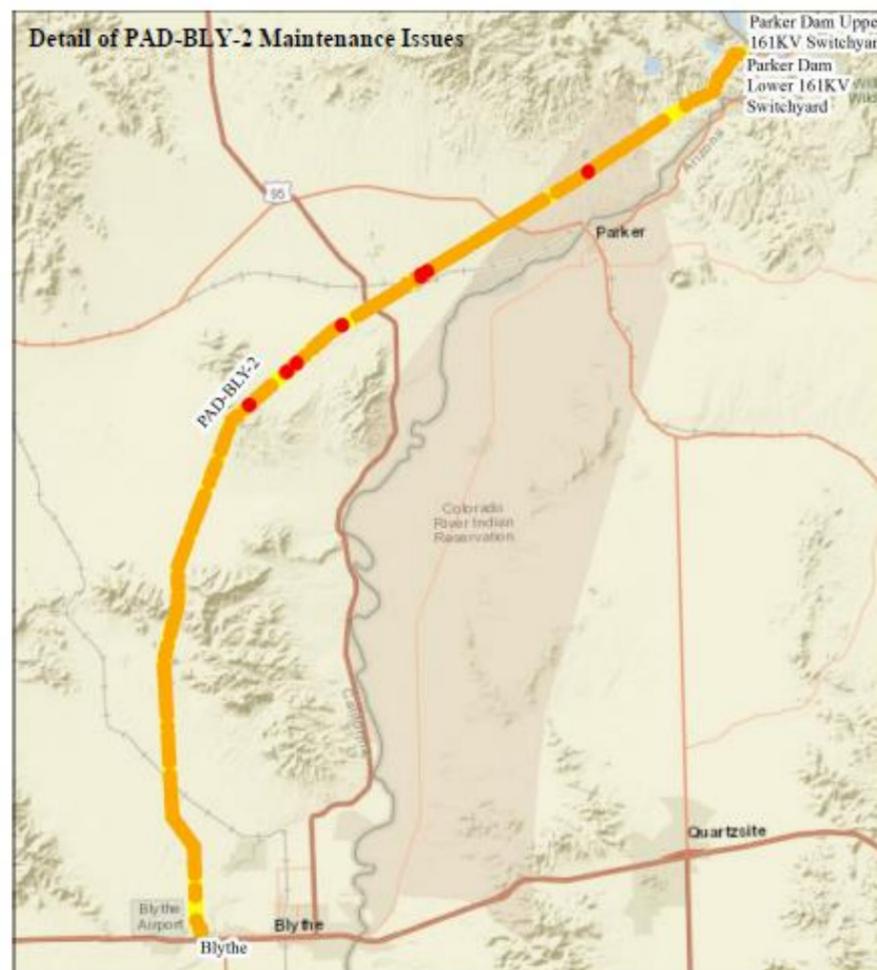
01%

### Outstanding Maintenance in 2018

Row Labels	C	D	E	Grand Total
Anchor	19			19
Brace	141	4		145
Crossarm	71	2		73
Guy	30			30
Insulator	34	1		35
Phase/Conductor	1			1
Pole	554	311	7	872
Pole Hardware	11	2		13
Signs	13			13
Static Wire	3	2		5
Vibration Damper	4			4
<b>Grand Total</b>	<b>881</b>	<b>322</b>	<b>7</b>	<b>1210</b>

Maintenance Priority Codes

<b>A</b>	Good or like new. No action required.
<b>B</b>	Minor defect. Monitor degradation.
<b>C</b>	Moderate defect. Rehabilitation or replacement recommended as scheduled maintenance.
<b>D</b>	Serious defect. Repair, reinforce, or replace as soon as possible.
<b>E</b>	Risk to public safety or system reliability.





## 10.4 Proposed Alternatives Overview and Selection

There were a total of five alternatives that were explored to provide a diverse range of viable, economically feasible design options. The feasibility/value of these Alternatives was explored in regards to Compliance, Reliability and Economy. A detailed breakdown of each Alternative can be found below.

- Alternative 1- Status Quo (Maintenance Only)
- Alternative 2- Replace wood poles in kind and add steel structure dead-ends every <10 miles
- Alternative 3- Rebuild with light duty steel H-Frame structures using 161-kV specifications and standards
- Alternative 3a- Rebuild with light duty steel H-Frame structures using 230-kV specifications and standards
- Alternative 4- Rebuild with steel monopoles using 161-kV specifications and standards
- Alternative 5- Rebuild with steel monopoles using 230-kV specifications and standards (operated at 161kV)

### Alternative #1- Status Quo (Maintenance Only)

The Parker-Blythe 161-kV Transmission Line would remain in its present condition continuing to deteriorate. The POLUX® test found only 20% of the line's supporting wood poles don't require replacement. WAPA's maintenance forces would replace individual wood poles as they fail or are deemed unfit to climb.

### Alternative #2- Upgrade – Add Steel Structure Dead-ends Every <10 Miles

After receiving environmental clearances and new or amended ROW from BLM construction can begin. All failing wood H-Frame structures would be replaced with new wood structures with steel cross-arms. Steel dead-end structures would be installed at intervals of less than 10 miles to mitigate the risk of cascading failure. Existing 954 ACSR conductor, insulators and hardware would be used, but one OGW would be replaced with OPGW. New structures will be installed using 161-kV clearances and standards.

### Alternative #3- Rebuild With Light Duty Steel H-Frame Structures Using 161-kV Specifications and Standards

After receiving environmental clearances and new or amended ROW from BLM construction can begin. All wood H-Frame structures would be replaced with new light duty steel H-Frame structures. Steel dead-end structures would be installed at intervals of less than 10 miles to mitigate the risk of cascading failure. New conductor, insulators and hardware would be used, one new OGW and one new OPGW would be installed. All structures will be installed using 161-kV clearances and standards.

### Alternative #3a- Rebuild With Light Duty Steel H-Frame Structures Using 230-kV Specifications and Standards

After receiving environmental clearances and new or amended ROW from BLM construction can begin. All wood H-Frame structures would be replaced with new light duty steel H-Frame structures. Steel dead-end structures would be installed at intervals of less than 10 miles to mitigate the risk of cascading failure. New conductor, insulators and hardware would be used, one new OGW and one new OPGW would be installed. All structures will be installed using 230-kV clearances and standards. The line would be operated at 161-kV until future conversion to 230-kV.



**Alternative #4- Rebuild With Steel Monopoles Using 161-kV Specifications and Standards**

After receiving environmental clearances and new or amended ROW from BLM construction can begin. All wood support structures would be replaced with new steel monopoles. Steel dead-end structures would be installed at intervals of less than 10 miles to mitigate the risk of cascading failure. New conductor, insulators, hardware, and OPGW would be used. The new design and construction would use 161-kV clearances and standards.

**Alternative #5- Rebuild With Steel Monopoles Using 230-kV Specifications and Standards (Operated at 161-kV)**

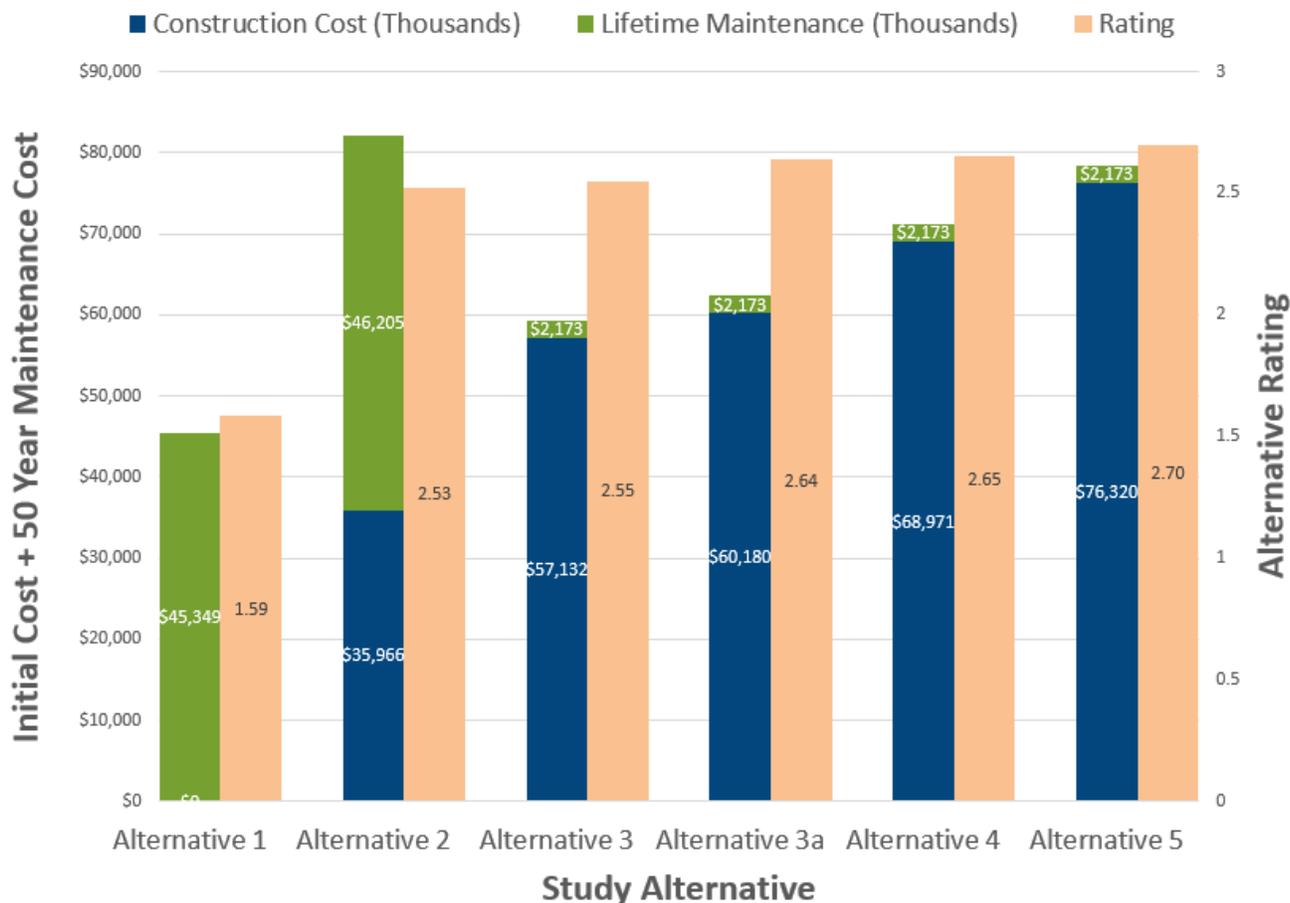
After receiving environmental clearances and new or amended ROW from BLM construction can begin. All wood structures would be replaced with new steel monopoles. Steel dead-end structures would be installed at intervals of less than 10 miles to mitigate the risk of cascading failure. New conductor, insulators, hardware, and OPGW would be used. The new design and construction would use 230-kV clearances and standards





## 10.5 Alternative Comparisons

Alternative Rank vs 50-Year Cost





## 10.6 Preferred Alternative

Although Alternative 4 achieved a higher AOA Rating, the cost required to achieve that rating is far greater than Alternative 3a, as can be seen in the graph above.

### Project Predesign Estimate for Preferred Alternative (Conceptual)

<b>Preferred Alternative #3a Conceptual Estimate</b>	
<b>Rebuild With Light Duty 230kV H-Frames</b>	
	<b>TOTAL</b>
Administrative (Inc. Project Management)	\$994,535
EVMS*	\$1,522,000
Design	\$414,975
Construction Contract	\$30,462,201
Government Furnished Equipment (GFE)**	\$15,661,286
Commissioning	\$382,532
Environmental	\$596,000
Land and Land Rights	116,236
<b>Subtotal</b>	<b>\$50,149,765</b>
Contingency (20%)	\$10,029,953
<b>Phase I, II, III Total Project Budget</b>	<b>\$60,179,718</b>

\*Earned Value Management System (EVMS) is a project management system required by the Department of Energy to manage cost and schedule on projects having a Total Project Cost (TPC) over \$20 million.

\*\*OPGW is 2.9% of Total Project Cost.





### 10.7 Conceptual Project Phasing

Alternative 3a: Blythe-Parker 161-kV Rebuild, Phase I, Phase II, and Phase III



Figure 23 Proposed Project Phasing Map





### Phase I

Design and construct 21 miles of 161-kV transmission line from Parker Substation to structure 20-8. Design includes replacing 160 wood structures with new light duty steel H-Frame structures, and installing new conductor, one new OGW, one new OPGW, new hardware, and insulators. Design should include installing steel dead-end structures every 5 to 10 miles to prevent cascading failure. The line will be designed to 230-kV standards and specifications but will be operated at 161-kV.

### Phase II

Design and construct 21.75 miles of 161-kV transmission line from structure 20-8 to structure 41-7. Design includes replacing 181 wood structures with new light duty steel H-Frame structures, and installing new conductor, one new OGW, one new OPGW, new hardware and insulators.

Design should include installing steel dead-end structures every 5 to 10 miles to prevent cascading failure. The line will be designed to 230-kV standards and specifications but will be operated at 161-kV.

### Phase III

Design and construct 21.25 miles of 161-kV transmission line from structure 41-7 to Blythe substation. Design includes replacing 182 wood structures with new light duty steel H-Frame structures, and installing new conductor, one new OGW, one new OPGW, new hardware and insulators. Design should include installing steel dead-end structures every 5 to 10 miles to prevent cascading failure. The line will be designed to 230-kV standards and specifications but will be operated at 161-kV.

### Advantages:

- No need to have contractor demobilize and remobilize between phases.
- Each phase can be scheduled around summer outage restrictions.
- Environmental clearance for all three phases can be obtained simultaneously.
- All GFE for all three phases can be ordered at the same time with deliveries scheduled as needed by each phase.

### Disadvantages:

- Three sets of specifications and drawings will be needed, a separate set for each phase.
- A separate construction contract would be needed for each phase.

### Project Assumptions and Constraints

- No line outages are allowed between May 1 and September 30 in any given year.
- Cost estimate is conceptual and must be revised before establishing a construction project budget.
- Schedules are based on conceptual Scope of Work and must be revised as design progresses.
- No new ROW is needed except for temporary construction easements.
- Existing ROW and access roads are overgrown and eroded.
- ROW crosses Federal Land, CRIT land and Desert Tortoise habitat.





# 11. APPENDICES

## 11.1 Action Items Captured February 27th, 2018 – Customer “Pivot” Strategy Meeting

### 1. General

- a. Post meeting media to WAPA website
- b. Ensure December Prepayment meeting date is coordinated around the Colorado River Water meeting that occurs the same month. Many of our customers attend that meeting as well so must avoid double-booking
- c. Please provide projected rate impact of the proposed “Pivot” strategy.
- d. Update the table of acronyms (“AOA” and others may be missing).
- e. Provide information on DSW’s annual capital program cap/threshold. \$20M annually was discussed in the meeting.

### 2. Proposed Projects FY19: Bouse-Kofa 161kV Rebuild

- a. Provide life cycle wood pole maintenance cost projects if available
  - i. If remaining wood poles on the line were NOT replaced with steel what is the expected 50 year life cycle cost?
- b. Why is the EVMs cost estimate higher than PAD-BLY?
  - i. BSE-KOF: \$ vs PAD-BLY: \$1.522M of \$60.179M
- c. Provide cost breakdowns of other alternatives studied in AOA
- d. Adjust the T-line mileage to remove the Quartzite portion of the line – 84 miles to 75 miles. Presentation stated, “20-30% of wood poles” are failing. What is the number of poles?
- e. Provide any outage information as it relates to the phasing of the project.

### 3. Proposed Projects FY20: Parker-Blythe #2 161kV Rebuild

- a. Confirm EVMs cost estimate
- b. Show cost comparison of 161kV vs 230kV (insulators, pole structures, no. of structures, misc. hardware, etc.)
- c. Provide cost breakdowns of other alternatives studied in AOA





- d. Consider pushing out PAD-BLY Phase I & II one year to reduce the \$28M spike in FY21. Can the system safety accommodate this delay in work?

DECEMBER 2018 PROJECTED PREPAYMENT VOTE (PIVOT YEAR)											
Start	Project	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	PCN Total	Project Total
FY18	Coolidge-Valley Farms 115kV Rebuild	\$ 800	\$ 2,673	\$ 1,138	\$ 205					\$ 4,816	\$ 4,816
FY18	Kofa-Dome Tap 161kV Rebuild	\$ 500	\$ 4,630	\$ 500						\$ 5,130	\$ 5,630
FY18	Dome-Gila 161kV Rebuild	\$ 500	\$ 5,951	\$ 950						\$ 6,901	\$ 7,401
FY19	Bouse-Kofa 161kV Rebuild Ph:I		\$ 465	\$ 6,376	\$ 7,620	\$ 778	\$ 311			\$ 15,085	\$ 15,550
FY19	Bouse-Kofa 161kV Rebuild Ph:II		\$ 465	\$ 6,376	\$ 7,620	\$ 778	\$ 311			\$ 15,085	\$ 15,550
FY20	Parker-Blythe 161kV Rebuild Ph: I			\$ 500	\$ 12,779	\$ 6,385	\$ 236	\$ 100		\$ 19,500	\$ 20,000
Fy21	Parker-Blythe 161kV Rebuild Ph: II			\$ 500	\$ 12,779	\$ 6,385	\$ 236	\$ 100		\$ 19,500	\$ 20,000
			\$ 14,184	\$ 15,840	\$ 28,724	\$ 20,720	\$ 7,243	\$ 336	\$ 100	\$ 86,017	\$ 88,947

- e. Add Salvage value of copper in the cost breakdown charts. Detail any additional salvage value asset retirements.

4. Maintenance/RRADs

- a. Brian Young request DSW’s Wood Pole Health Index information. Provide Annual report or holistic summary of the state of wood poles in WAPA’s system.
- b. Provide how many wood poles per year DSW replaces through it’s RRADs program and how many poles need replacement in the whole system?
- c. Wood vs. Steel study should be visited with customers for potential Policy/Standard

11.2 Action Items Captured February 28th, 2018 - Customer Technical Committee (CTC)

**External Attendees:** Angelo, Bristol, Curtis, Delaney (phone), Emler, Lee, Lozier, Pyper, Sanders (phone), Saline (phone)

1. How many wood poles does DSW replace a year?
2. How many wood poles on the proposed FY19/20/21 projects?
3. Provide customers details about DSW’s RRADs program in future customer 10-Year Plan meetings.
4. Provide customers the wood vs steel white paper referenced at the 2/27 TYP meeting.
5. Were steel structure failure rates included in asset management’s numbers for the 50 year maintenance cost graph on Parker-Blythe?
6. Request for more information on power flow and load growth south of Parker Substation.
7. Email the customers a list of questions received from the 2/27 TYP meeting.
8. Provide how many wood poles per year DSW replace as RRADs and how many poles need replacement in DSW’s system.
9. Respond to the request to “smooth” the 10-Year Plan as suggested at the 2/27/18 10-Year Plan Meeting.
10. Plan site visits for existing and future construction projects.





### 11.3 AOA Evaluation Methodology

During the Alternative Selection process of the Analysis of Alternatives (AOA), a ratings system consisting of three categories is used. Those categories are Compliance, Reliability, and Economics. WAPA has established a standard weighting for each category as follows: 40% Compliance, 35% Reliability and 25% Economics. This standard rating is the cornerstone in providing safe, secure, reliable and affordable transmission services. However, each of these three criteria can be weighted independently during the development of the Mission Need and the Alternatives when appropriate.

The methods utilized for WAPA's AOA Selection Process were created based on criteria derived from the Department of Energy (DOE)<sup>1</sup> and the Government Accountability Office (GAO)<sup>2</sup>. The DOE and GAO have provided guidance and best practices on the execution of an AOA study. DSW is following all relevant suggestions and incorporating guidance into the 10-Year Planning Program with a focus to meeting best practices outlined on behalf of the Federal Government for the benefit of its customers and stakeholders.

<sup>1</sup>"DOE 413.3B - Program and Project Management for the Acquisition of Capital Assets"

<sup>2</sup>"GAO-15-37 - DOE and NNSA Project Management - Analysis of Alternatives Could Be Improved by Incorporating Best Practices"

#### 1. General Principals

- 1.1. The customer(s)/stakeholder(s) define the mission need and functional requirements without a predetermined solution.
- 1.2. The customer(s)/stakeholder(s) provide the team conducting the AOA with enough time to complete the AOA process to ensure a robust and complete analysis.
- 1.3. The team includes members with diverse areas of expertise including, at a minimum, subject matter expertise, project management, cost estimating, and risk management.
- 1.4. The team creates a plan, including proposed methodologies, for identifying, analyzing, and selecting alternatives, before beginning the AOA process.
- 1.5. The team documents all steps taken to identify, analyze and select alternatives in a single document.
- 1.6. The team documents and justifies all assumptions and constraints used in the analysis.
- 1.7. The team conducts the analysis without a predetermined solution.

#### 2. Identifying Alternatives

The team:

- 2.1. Identifies study alternatives that are sufficient, diverse, viable, and economically feasible; representing a suitable range of design alternatives.
- 2.2. Describes alternatives in sufficient detail to allow for robust analysis.
- 2.3. Includes one alternative representing the status quo to provide a basis of comparison among alternatives.
- 2.4. Screens the list of alternatives before proceeding, eliminates those that are not viable, and documents the reasons for eliminating any alternatives.

#### 3. Analyzing Alternatives

The team:

- 3.1. Develops a life-cycle cost estimate for each alternative, including all costs from inception of the project through design, development, deployment, operation, maintenance, and retirement.
- 3.2. Presents the life-cycle cost estimate for each alternative as a range or with a confidence interval, and not solely as a point estimate.
- 3.3. Expresses the life-cycle cost estimate in present value terms





- 3.4. Uses a standard process to quantify the benefits/effectiveness of each alternative and documents this process.
- 3.5. Quantifies the benefits/effectiveness resulting from each alternative over that alternative's full life cycle, if possible.
- 3.6. Explains how each measure of benefit/effectiveness supports the mission need.
- 3.7. Identifies and documents the significant risks and mitigation strategies for each alternative.
- 3.8. Tests and documents the sensitivity of both the cost and benefit/effectiveness estimates for each alternative to risks and changes in key assumptions.

#### **4. Selecting a Preferred Alternative**

- 4.1. The team or the decision maker defines selection criteria based on the mission need.
- 4.2. The team or the decision maker weights the selection criteria to reflect the relative importance of each criterion.
- 4.3. An entity independent of the AOA process reviews the extent to which all best practices have been followed (for certain projects, additional independent reviews may be necessary at earlier stages of the process such as for reviewing the study plan or for reviewing the identification of viable alternatives).





## 11.4 WAPA's Ranking Process – Maintenance, Design, and Construction Council (MDCC)

Criteria for Evaluating Capital Projects and Ranking Them for Comparison

### **Project Ranking:**

Each Project will be ranked based on **Compliance**, **Reliability**, and **Economics** to determine the overall order these projects should be implemented. Each of these categories is comprised of specific criteria that will be evaluated and assigned a ranking based on importance/impact to the proposed project.

The **Compliance** category includes the following criteria:

- Meets Environmental regulatory requirements (not including projects that are solely to enhance the environment, IE. Basic Substation cleanup).
- Meets North American Electric Reliability Corporation (NERC) reliability standards.
- The equipment or facility currently is or in the near future will constrain the transmission system
- Meets Health and Safety requirements.
- Each criterion has equal weight within the category.

The **Reliability** category includes the following criteria:

- Condition of the equipment or facility
- Availability of replacement parts or repair services
- Impact to the power system if the project is not completed
- Number of outages that have occurred and the frequency of outages
- Facility loading and encroachment on maximum ratings
- Risk score(s) from the AM Risk Register Spreadsheet of various equipment that may be included in a project.

Each criterion has equal weight within the category.

The **Economic (WAPA and its customers)** category includes the following criteria:

- The economic impacts of not completing the project is determined to be significant to the regional transmission system.
- There is a contractual need for the project such as a power marketing agreement stating the need.
- An obligation for a path that meets a contractual requirement.
- Loss of revenue to WAPA, including additional revenue that would become available as a direct result of the project.
- Customer(s) incur increased costs if they need to purchase alternate path or power.

Each criterion has equal weight within the category.





The ranking levels are as follows:

0 - Minor: There is negligible impact in regards to the issue and why the project is needed

1 - Moderate: There is limited impact in regards to the issue and why the project is needed

2 - Major: There is significant impact in regards to the issue and why the project is needed

3 - Severe: There is high impact in regards to the issue and why the project is needed

4 - Catastrophic: Failure to complete the project will result in extended outages, severe system degradation and/or significant economic repercussions.

After each of the proposed projects is rated for each of the categories, the following weighting factor is applied:

- Compliance will have a weighting factor of 0.40 because of the need of the project and possible impact to life or limb, heavy fines could be imposed, and the requirement by law or regulation.
- Reliability will have a weighting factor of 0.35 because of its impact to the system and WAPA's credibility and reputation if there is a failure or outage.
- Economical will also have a weighting of 0.25 due to the monetary impact and direct impact to our customers if the project is not completed.

**Other Considerations:**

- If a capital project has had a prior year start, meaning that the project had a construction award or a major equipment purchase in the prior fiscal year, it will be given a priority in funding consideration in order to avoid increased costs resulting from equipment delivery issues, contract modifications, interest during construction (IDC), and personnel scheduling. If there is a funding conflict, a further comparison of risk will be performed.
- If the project has joint participation (i.e. Partial funding from customer trust project and partial WAPA funding) it will be given priority in funding consideration similar to prior year start projects.
- A NERC compliance violation, or other system emergency need, which may require a new project start, might be more costly than increased costs from delays to an on-going capital project, and may be given priority. In other words, cost impacts from delaying any prior starts will be weighed against the impact of not complying with NERC Standards or not correcting the system need.
- Interconnection requests that are not funded by the requestor will be included in this process for ranking.
- Upon completion of the ranking consensus, each region will review their qualifying projects to verify and confirm that they can execute the appropriated funds by fiscal year end.

