

**DESERT SOUTHWEST REGION
TEN-YEAR PLAN
Fiscal Year 2017-2026**



ANNUAL CUSTOMER MEETING: AUGUST 23, 2016

**DESERT SOUTHWEST REGIONAL OFFICE
615 S. 43RD AVE
PHOENIX, AZ**



**Western Area
Power Administration**

POWERING THE ENERGY FRONTIER

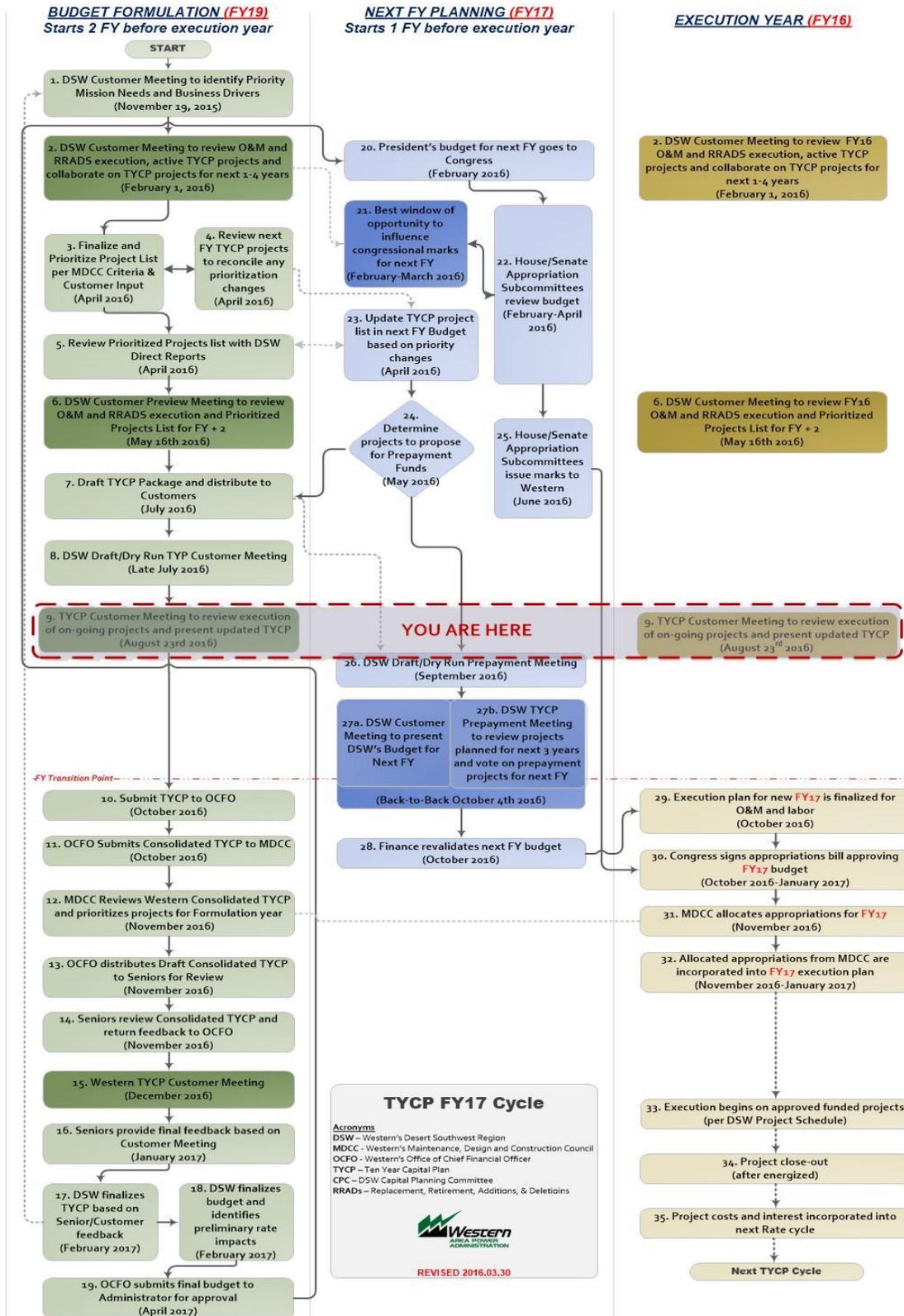




Table of Contents

1. INTRODUCTION.....	5
2. DESERT SOUTHWEST POWER SYSTEMS	
2.1 Boulder Canyon (BC).....	6
2.2 Central Arizona Project (CAP)	7
2.3 Colorado River Front Work and Levee (Levee)	8
2.4 Salinity	8
2.5 Colorado River Storage Project (CRSP)	9
2.6 Pacific Northwest/Southwest Intertie (Intertie)	10
2.7 Parker – Davis (PD)	11
3. CONSTRUCTION PROJECT FUNDING HISTORY	
4. MAJOR CONSTRUCTION PROJECTS COMPLETED	
4.1 Mead Substation – CCVT Support Structure Replacement.....	13
4.2 Mead Stage 15 – Transformer Replacement	14
4.3 Relocate Liberty Spare KU1A Transformer to Mead	15
4.4 Davis Substation Maintenance Building	16
4.5 Del Bac- Nogales Right-of-Way Renewal	17
5. ACTIVE CONSTRUCTION PROJECTS	
5.1 Crossman Peak Microwave Facility	18
5.2 Liberty Series Capacitor Bank.....	19
5.3 Facility Ratings Mitigation Year 2	20
5.4 Mesa Substation Remediation	21
5.5 Tucson Substation Rebuild.....	23
5.6 Parker 161kV Switch Replacement (Canceled)	24
5.7 Facility Ratings Mitigation Year 3 (Canceled).....	25
5.8 Parker - Headgate Rock & Parker- Bouse 161kV Reroute	26
5.9 Gila Substation 161kV Rebuild	27
5.10 Gila- Knob 161kV Rebuild	28





6. FY17 PROPOSED NEW PROJECTS

6.1 Proposed Pre-payment Funding Plan 30

6.2 Gila Substation 161kV Rebuild 30

6.3 Gila-Knob 161kV Rebuild 36

6.4 Gila-Wellton Mohawk 161kV Rebuild 40

7. RETIREMENTS, REPLACEMENTS, & ADDITIONS

7.1 Overview 45

7.2 RRADs Budget 45

7.3 RRADs FY16 Funds Executed By Power System (>\$200,000) 46

7.4 RRADs Projects by Power System for FY17 (>\$200,000) 47

8. TEN YEAR PLAN SPREADSHEETS

8.1 DSW FY17-26 Capital Construction Program 49

8.2 DSW Prepayment Project Status Report 51

9. APPENDICES

9.1 Table of Acronyms 52

9.2 DSW FY17-21 Capital RRADS Program 53

9.3 AOA Evaluation Methodology 57

9.4 WAPA’s Ranking Process – Maintenance, Design, and Construction Council (MDCC) 57

9.5 DSW Organizational Charts 60





1. Introduction

Western Area Power Administration (WAPA) markets and delivers reliable, cost-based hydroelectric power and related services within a 15-State region of the central and western parts of the United States. WAPA is one of four power marketing administrations within the U.S. Department of Energy whose role is to market and transmit electricity from multi-use water projects. WAPA's transmission system carries electricity from 57 power plants. These power plants are operated by agencies such as the Bureau of Reclamation, U.S. Army Corps of Engineers, the International Boundary and Water Commission, as well as a number of private entities. These plants combined have an installed capacity of 10,395 Megawatts.

WAPA is divided into four primary regions. Upper Great Plains (UGP) located in Billings, Montana; Rocky Mountain Region (RMR) located in Loveland, Colorado; Sierra Nevada Region (SNR) located in Folsom, California; and Desert Southwest Region (DSW) located in Phoenix, Arizona. In addition to the four operating regions, a Management Center is located in Salt Lake City, Utah. All the regions are supported by a central Headquarters (HQ) office located in Lakewood, Colorado. WAPA's HQ serves many diverse customers, ranging from Congress to Native American power customers, special interest groups and WAPA's regional offices. HQ is responsible for designing WAPA's electrical projects and handles most of the support services such as legal, and human resources.

The Desert Southwest Region (DSW) sells power in Arizona, Nevada, southern California, and portions of the Southwest. The recipients of this power include wholesale customers such as towns, rural electric cooperatives, public utility and irrigation districts, Federal, state and military agencies, Native American tribes, investor-owned utilities, power marketers and U.S. Bureau of Reclamation customers. DSW is committed to maintaining and operating a reliable transmission system. The Ten-Year Capital Program (Capital Program) provides both a capital investment plan, as well as a funding plan, that will maintain reliable power delivery to WAPA's customers.

The purpose of the Capital Program presentation for WAPA's Desert Southwest Region (DSW) is to clearly describe challenges, goals, objectives, strategies, and accomplishments, as well as provide a mechanism for customer collaboration.

The Capital Program is revised annually in response to:

- Approved funding allocations for the budget year
- Optimized project priorities
- Emerging issues within the transmission system
- Mandates or regulatory requirements
- New contractual requirements





2.0 Desert Southwest Power Systems

2.1 Boulder Canyon (BC)

Hoover Dam is the backbone of the Boulder Canyon (BC) Project. The Hoover Power plant has 19 generating units, including 2 house units, with an installed capacity of 2,079 Megawatts (MW). For the last ten years Hoover has generated, on average, 3,800,000 Megawatt hours (MWh) of energy, which can serve the annual electrical needs of nearly 1.1 million people. Power from this project is marketed as long-term contingent capacity with associated firm energy. This contingent capacity and associated firm energy is available, as long as there are sufficient water releases to generate the power. The majority of WAPA's facilities for BC are 230kV transmission lines, extending approximately 12 miles from Hoover Dam to the Mead Substation.

System Information

Substations	1
Transmission Line Structures	424
Total Circuit Miles	53.3



Figure 1 - Hoover Dam & Lake Mead





2.2 Central Arizona Project (CAP)

The Central Arizona Project (CAP) is one of three related water development projects that make up the Colorado River Basin Project. The CAP was developed to provide water throughout Arizona and New Mexico. DSW operates and maintains the power system required for the CAP system. Surplus CAP and Navajo transmission along with surplus power from the United States share of the Navajo Generating Station are marketed by DSW on behalf of the Bureau of Reclamation.

System Information

Substations	9
Transmission Line Structures	2,077
Total Circuit Miles	288

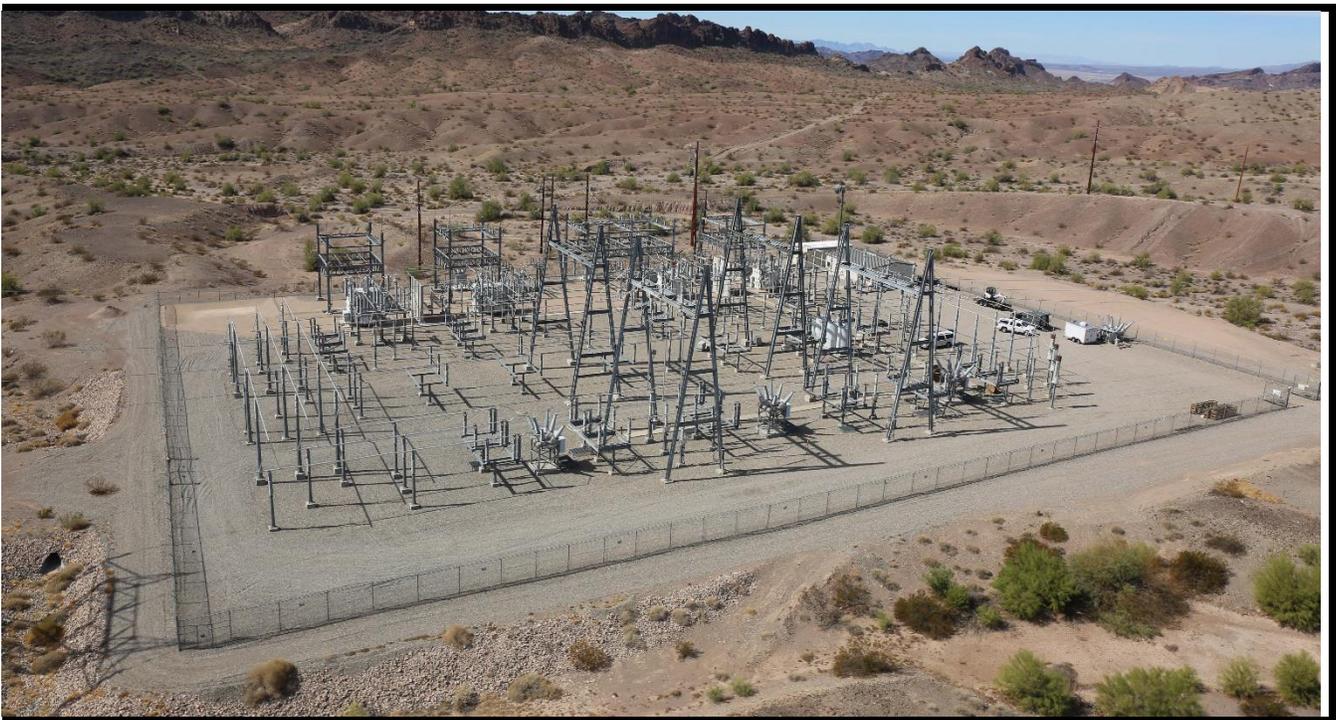


Figure 2-Figure 2- Black Mesa Substation





2.3 Colorado River Front Work and Levee (Levee)

The Colorado River Front Work and Levee System (Levee) extends from Lees Ferry, Arizona (the division point between the Upper and Lower Colorado River Basins) to the International Boundary between the United States and Mexico. Spanning a distance of approximately 700 river miles, the purpose of this system is to control floods, improve navigation, and flow regulation of the Colorado River.

This multi-purpose program encompasses control of sediment movement, protection of communities, transportation facilities, and maintenance of agricultural land by controlling the bed and banks of the river. This system also supports the preservation and enhancement of fish, wildlife, and recreation facilities. WAPA's 34.5kV and 69kV system in the Yuma area primarily supports the pumping load required by the Bureau of Reclamation to carry out the activities described above.

System Information

Substations	3
Transmission Line Structures	348
Total Circuit Miles	27

2.4 Salinity

The purpose of this system is to regulate the salinity levels of the Colorado River water delivered to Mexico. This program utilizes WAPA's 34.5kV and 69kV system in the Yuma area primarily by supporting the pumping of ground water to meet the salinity requirements.

System Information

Substations	3
Transmission Line Structures	408
Total Circuit Miles	34





2.5 Colorado River Storage Project (CRSP)

The CRSP provides water-use developments in the upper Colorado River Basin and the lower Colorado River, as required by the Colorado River Compact. Five Federal power plants are associated with the project. Of the five power plants Glen Canyon generation provides 1340 MW and is the primary CRSP source of power for the DSW region. DSW maintains the Western Area Lower Colorado System (WALC), including Shiprock, Kayenta, Longhouse Valley, Glen Canyon, Flagstaff, and Pinnacle Peak substations. In addition, DSW operates and maintains, Mexican Hat, Zilner, Glen Canyon, Preston Mesa, Elden Mountain, Mingus Mountain, Tower Mountain, Thompson, and Lolamia Point communication sites.

CRSP provides for the electrical needs of more than one million people spread throughout Colorado, Utah, New Mexico, and Arizona; as well as portions of southern California, Nevada, and Wyoming. More than 2,323 miles of high-voltage transmission lines exist within these states to deliver power to customers.

System Information

Substations	9
Transmission Line Structures	2,077
Total Circuit Miles	288



Figure 3 - Aerial view of Glen Canyon Dam





2.6 Pacific Northwest/Southwest Intertie (Intertie)

The Pacific Northwest-Pacific Southwest Intertie (Intertie) was authorized by the Pacific Northwest Power Marketing Act. Originally, Intertie was planned to be an AC and DC system which would connect the Pacific Northwest with the Pacific Southwest. As authorized, the overall project is a co-operative construction venture between Federal and non-Federal entities. Due to delays in construction funding, interest among the potential users has waned; resulting in the indefinite postponing of DC line construction. Consequently, the facilities constructed provide AC transmission service.

WAPA's portion of Intertie consists of two parts: a northern portion and a southern portion. The northern portion is administered by WAPA's Sierra Nevada Region, and the southern portion by DSW. The southern portion is treated as a separate (stand-alone) project for repayment and operational purposes.

The southern portion consists of a 345kV transmission line from Mead Substation to Liberty Substation, a 230kV line from Liberty Substation to Westwing Substation, a 230kV line from Westwing Substation to Pinnacle Peak Substation, and two 500kV segments from Mead Substation to Perkins Substation and Mead Substation to Marketplace Substation.

System Information

Substations	9
Transmission Line Structures	2,580
Total Circuit Miles	951



Figure 4 - Mead Substation





2.7 Parker – Davis (PD)

Parker-Davis has the majority of the DSW regional power facilities, and was formed by consolidating two projects in 1954; Parker Dam and Davis Dam. Parker Dam and Power plant, which created Lake Havasu (155 miles below Hoover Dam on the Colorado River), were authorized by the Rivers and Harbors Act of 1935. The Parker Power plant has 4 generating units with an installed capacity of 120 MW.

Davis Dam located on the Colorado River, 67 miles below Hoover Dam, created Lake Mohave. Davis Power plant has 5 generating units with an installed capacity of 255 MW. Parker-Davis is operationally integrated with the Hoover Power plant. In the event that Parker-Davis generation is insufficient to meet firm contractual obligations, banked Hoover generation maybe used. Alternatively, WAPA may purchase power from other resources.

The Parker-Davis Project supplies the electrical needs of more than 300,000 people. Power generated from this project is marketed to customers in Nevada, Arizona, and California. The DSW facilities that are part of the Parker-Davis Project include substations such as Davis, Parker, Gila, Lone Butte, Coolidge, and Tucson. Transmission lines within this project range from 34.5kV to 230kV, and are constructed of wood, steel, or concrete.

System Information

Substations	53
Transmission Line Structures	9,993
Total Circuit Miles	1,534



Figure 5 - Aerial Photo of Parker Substation & Dam





3. Construction Project Funding History

Construction projects, in comparison to RRADs, are typically more complex in nature and require the use of an outside construction contractor in lieu of Federal labor. These projects are multi-year funded, and the majority will cross fiscal years and take extended periods of time to complete. Federal labor and contract labor are utilized to complete the project design and specifications, environmental requirements, procurement of equipment and construction contracts, construction management, project tracking, financial management, commissioning, and closeout. The construction contractor will typically install the physical components of the project, such as circuit breakers, transformers, steel structures, control buildings, transmission lines, structures, and conductors.

The construction project list may be adjusted in order to accommodate any changes in the amount of funding received and the time of year the funding is provided. For example, a Continuing Resolution (CR) (or any other delay in funding) dramatically impacts DSW's ability to execute funds in a timely manner. A CR not only restricts the amount of funds available for construction contracts, but also restricts the amount of federal labor that can be expended to get the design and specifications for a project completed prior to fiscal year end.

In FY10, WAPA and its customers collaborated to address this ongoing struggle with project funding and collectively decided to create a method to use pre-payment funding for selected construction projects. Projects that are proposed for the use of pre-payments funds are first submitted for funding through the appropriated funding process. If adequate appropriations are not received, then the approved pre-payment project(s) are executed using pre-payment funding.

The Construction Program is reviewed by WAPA's management team annually in June. Potential projects suitable for pre-payment funding are selected from the list of projects previously submitted to Congress for the receipt of appropriated funding. Proposed pre-payment projects selected by WAPA are then presented to WAPA's customers for review and consideration in the Ten-Year Capital Program booklet, published annually.

Customers are engaged in an early summer Ten Year Capital Plan (TYCP) preview meeting, providing a forum for WAPA and its customers to have an open dialog about the projects, answering any questions or concerns that the customers may have, and optimizing project priorities. Then in the late summer or fall DSW presents its annual TYCP to the customers. An official vote on the proposed pre-payment projects is conducted approximately one month after the annual TYCP meeting each year, to ensure that only projects that receive customer support for funding through this mechanism are pursued.





4. Major Construction Projects Completed

4.1 Mead Substation CCVT Support Structure Replacement

This project was managed in conjunction with the Mead Stage 15 Project and incorporated into one design and specification package. This optimized outage coordination, contractor operations, and WAPA management of all of the work performed at Mead. This project addressed extensive cracking, expansion, spalling and advanced deterioration of the support structures.

Project Status

- Field construction completed May 20th , 2016
- 27 concrete 230kV CT and CCVT support structures rebuilt/replaced
- Project currently in close-out

	[A]	[B]	[C]	[D] [A+B+C]	[E]	[F] [D-E]	[G]	[H] [D+G]
Funding Summary	Original Project Budget	Prepayment Adjustments	Appropriations Adjustments	Current Project Budget	Total Executed	Remaining Funds	Additional Funds Required	Revised Project Budget
Prepayment	975,000	-	-	975,000	847,141	127,859	-	975,000
Appropriations	-	-	-	-	-	-	-	-
Total Project Funding	975,000	-	-	975,000	847,141	127,859	-	975,000

Executions include expenses, obligations, and commitments through 8/09/16



Figure 6 -Support Structure Prior to Replacement/Repair





4.2 Mead Stage 15 - Transformer Replacement

A new 600MVA 345/230/24kV transformer was purchased, placed on a new concrete pad, and assembled during the Mead Stage 14 project. Mead Stage 15 completed the installation of all necessary bus, breakers, switches and relays placing the new transformer in parallel with the existing KU2A transformer. The new configuration provides the flexibility to operate the transformers individually which lessen service interruptions for routine maintenance and improves system reliability.

Project Status

- Field construction completed on May 20th, 2016
- Project currently in close-out

	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]
Funding Summary	[A+B+C]	[D+E]	[D+G]	[D+G]				
Funding	Original Project Budget	Prepayment Adjustments	Appropriations Adjustments	Current Project Budget	Total Executed	Remaining Funds	Additional Funds Required	Revised Project Budget
Prepayment	-	-	-	-	-	-	-	-
Appropriations	8,000,000	-	178,697	8,178,697	8,178,697	-	-	8,178,697
Total Project Funding	8,000,000	-	178,697	8,178,697	8,178,697	-	-	8,178,697

Executions include expenses, obligations, and commitments through 8/09/16



Figure 7- Mead Substation Aerial View





4.3 Relocate Liberty Spare KU1A Transformer to Mead

The existing Mead KU2A transformer was constructed in 1964 and started showing signs of degradation approximately eight years ago. In conjunction with Mead Stage 14 & 15, WAPA took action to mitigate the risk of a potential Mead KU2A transformer failure. Risk mitigation alternatives were identified and from that process it was determined that the compatible spare Liberty Substation KU1A transformer would be relocated and staged at the Mead substation. The spare transformer has been serviced and is now located at Mead substation, adjacent to the in service KU2A transformer, available in the event of an emergency.

Project Status

- Transformer relocation contract awarded May 2015
- Project completion October 2015
- Project has been financially closed-out

	[A]	[B]	[C]	[D] [A+B+C]	[E]	[F] [D-E]	[G]	[H] [D+G]
Funding Summary								
Funding	Original Project Budget	Prepayment Adjustments	Appropriations Adjustments	Current Project Budget	Total Executed	Remaining Funds	Additional Funds Required	Revised Project Budget
Prepayment	-	-	-	-	-	-	-	-
Appropriations	700,000	-	-	700,000	666,229	33,771	-	700,000
Total Project Funding	700,000	-	-	700,000	666,229	33,771	-	700,000

Executions include expenses, obligations, and commitments through 8/09/16



Figure 8-Liberty KU1A Transformer





4.4 Davis Substation Maintenance Building

The new maintenance building provides office and shop space for electricians, relay, and communications technicians assigned to the Davis Substation. The building was designed as a pre-engineered 80'x 40' metal structure. In addition to the building, a parking shade structure was also installed.

Project Status

- Construction contractor mobilized May 2015
- Projected completed October 2015
- Project in close-out

	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]
Funding Summary				[A+B+C]		[D-E]		[D+G]
Funding	Original Project Budget	Prepayment Adjustments	Appropriations Adjustments	Current Project Budget	Total Executed	Remaining Funds	Additional Funds Required	Revised Project Budget
Prepayment	-	-	-	-	-	-	-	-
Appropriations	1,535,739	-	-	1,535,739	1,512,521	23,218	-	1,535,739
Total Project Funding	1,535,739	-	-	1,535,739	1,512,521	23,218	-	1,535,739

Executions include expenses, obligations, and commitments through 8/09/16



Figure 9-Davis Substation Maintenance Building





4.5 Del Bac- Nogales Right-of-Way Renewal

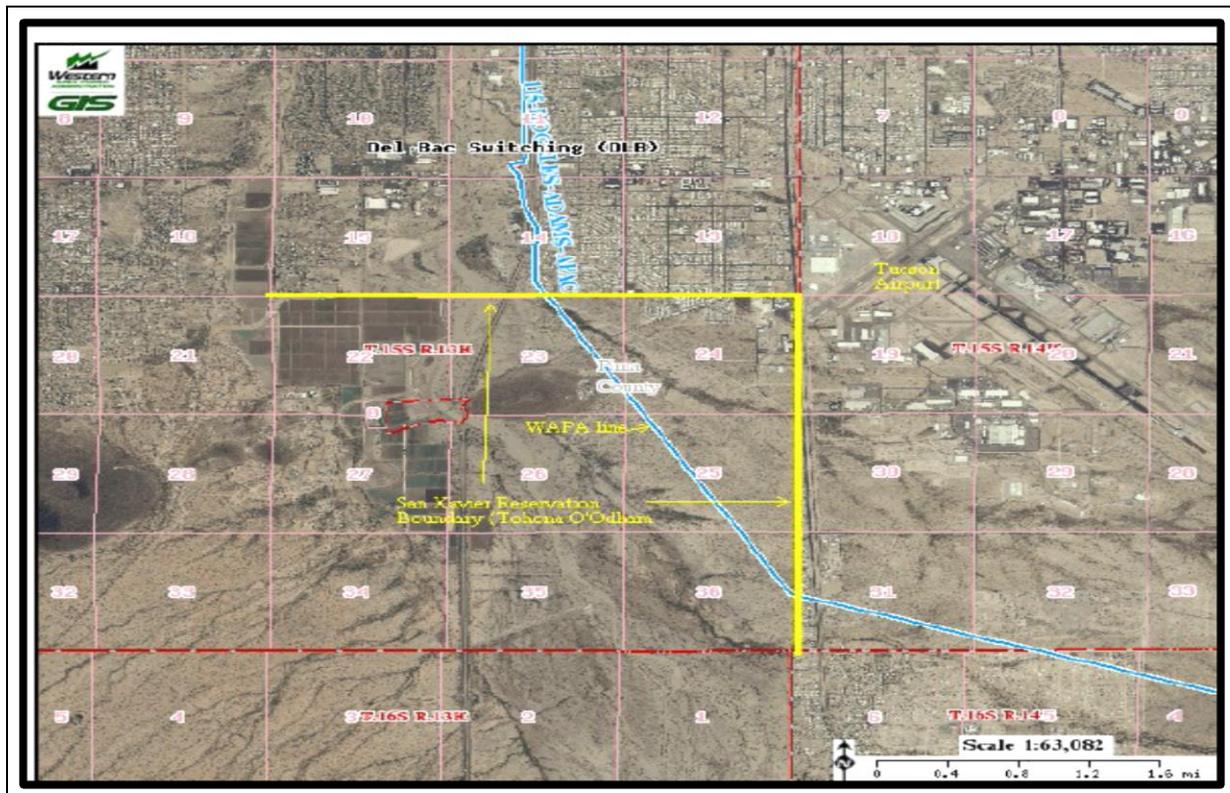
The purpose of this project was to renew the right-of-way agreement for a portion of the 115kV line that crosses the Tohono O’odham tribal property between Del Bac and Nogales substations. WAPA has a 115kV line that crosses approximately 4.5 miles of the Tohono O’odham tribal land south of Tucson. The right-of-way agreement for this portion of line expired in 2009. In order to keep the line in its present location and to properly maintain it, a new ROW agreement between WAPA and the Tohono O’odham was required. WAPA’s Land Department negotiated a new 50 year agreement with the tribe. The 50 year agreement is effective retroactively to the time of expiration in 2009.

Project Status

- WAPA closed the transaction with the Tohono O’odham Tribe in March of 2016.

	[A]	[B]	[C]	[D] [A+B+C]	[E]	[F] [D-E]	[G]	[H] [D+G]
Funding Summary	Original Project Budget	Prepayment Adjustments	Appropriations Adjustments	Current Project Budget	Total Executed	Remaining Funds	Additional Funds Required	Revised Project Budget
Prepayment	3,550,000	-	-	3,550,000	3,500,146	49,854	-	3,550,000
Appropriations	-	-	-	-	-	-	-	-
Total Project Funding	3,550,000	-	-	3,550,000	3,500,146	49,854	-	3,550,000

Executions include expenses, obligations, and commitments through 8/09/16





5. Active Construction Projects

5.1 Crossman Peak Microwave Facility

This project is constructing a new 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, transmission tower, backup generator with fuel tanks, a distribution power line for primary power, and an access easement.

Project Status

- Survey/Legal description and site layout has been completed
- Contract with UNS/TEP for the distribution line is executed
- Right-of-way and lands work is underway
- Projected completion of construction April 2018
- Projected completion of close-out September 2018

	[A]	[B]	[C]	[D] [A+B+C]	[E]	[F] [D-E]	[G]	[H] [D+G]
Funding Summary								
Funding	Original Project Budget	Prepayment Adjustments	Appropriations Adjustments	Current Project Budget	Total Executed	Remaining Funds	Additional Funds Required	Revised Project Budget
Prepayment	4,525,000	-	-	4,525,000	540,493	3,984,507	-	4,525,000
Appropriations	-	-	-	-	-	-	-	-
Total Project Funding	4,525,000	-	-	4,525,000	540,493	3,984,507	-	4,525,000

Executions include expenses, obligations, and commitments through 8/09/16



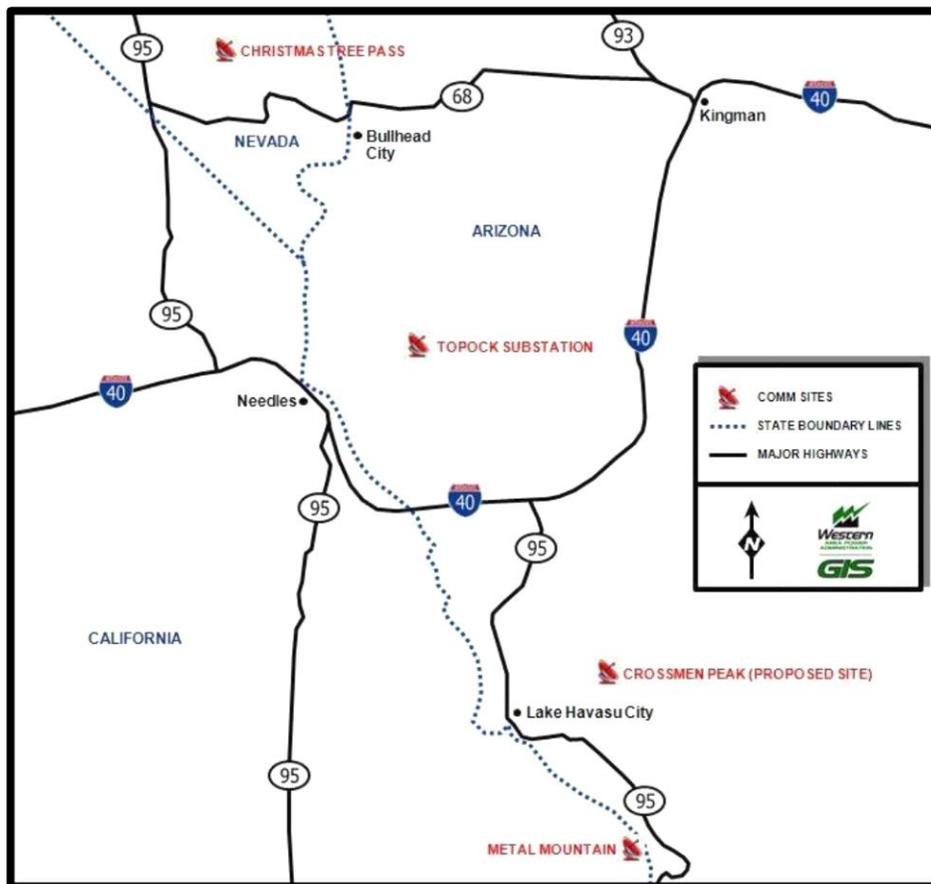


Figure 10-Microwave Site Locations

5.2 Liberty Series Capacitor Bank

Construct and install a new 345kV series capacitor bank to replace the existing, in-service, Westinghouse Capacitor bank (PU1A). This station equipment was installed in 1969 and has degraded significantly. The series capacitor bank is made up of: capacitor cans, a control system, air compressor, air dryer, air piping system, inserting circuit breaker, relaying, surge arrestors and reactors.

Project Status

- New capacitor bank will be installed adjacent to the existing unit
- New capacitor bank will be Government Furnished Equipment (GFE)
- Award construction contract June of 2017
- Projected completion of construction June 2018
- Projected completion of close-out December 2018





Funding Summary	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]
				[A+B+C]		[D-E]		[D+G]
Funding	Original Project Budget	Prepayment Adjustments	Appropriations Adjustments	Current Project Budget	Total Executed	Remaining Funds	Additional Funds Required	Revised Project Budget
Prepayment	10,372,000	-	-	10,372,000	7,591	10,364,409	-	10,372,000
Appropriations	-	-	-	-	-	-	-	-
Total Project Funding	10,372,000	-	-	10,372,000	7,591	10,364,409	-	10,372,000

Executions include expenses, obligations, and commitments through 8/09/16



Figure 11 - Aerial View Liberty Substation

5.3 Facility Ratings Mitigation Year 2

DSW’s Year 2 National American Electric Reliability Corporation (NERC) facility assessment LiDAR surveyed 1,087 miles of transmission line, resulting in 240 potential violations. After field verification, 79 deficiencies were found requiring a design solution, with the majority of them existing on four different line segments, which required construction in order to mitigate the violation. Although the required work is on (4) different line segments, the solicitation will be a single construction contract.

Line Segments Include:

- Gavilan Peak – Prescott
- Prescott – Round Valley
- Round Valley – Peacock
- Black Mesa – Topock (CAP)





Project Status

- Field construction started Fall 2015
- Peacock-Round Valley, Topock-Black Mesa, & Prescott-Gavilan Peak segments are completed
- Round Valley-Prescott line segments are scheduled to start in November 2016
- Projected completion of construction June 2017
- Projected completion of close-out December 2017

	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]
Funding Summary				[A+B+C]		[D-E]		[D+G]
Funding	Original Project Budget	Prepayment Adjustments	Appropriations Adjustments	Current Project Budget	Total Executed	Remaining Funds	Additional Funds Required	Revised Project Budget
Prepayment	3,225,000	5,300,000	-	8,525,000	7,385,656	1,139,344	-	8,525,000
Appropriations	-	-	384,603	384,603	384,603	-	-	384,603
Total Project Funding	3,225,000	5,300,000	384,603	8,909,603	7,770,259	1,139,344	-	8,909,603

Executions include expenses, obligations, and commitments through 8/09/16



Figure 12- Insulator Work on the Peacock-Round Valley Line

5.4 Mesa Substation Remediation

Complete the demolition and cleanup of the former 9.2 acre Mesa substation, and prepare it for sale as surplus land. The substation, which is located in a highly populated residential area, has been decommissioned. All yard equipment and support structures have been removed; but buildings, concrete foundations, and underground oil piping have been left in place. The environmental survey has been completed and the Arizona Department of Environmental Quality (ADEQ) has approved the remediation work plan. WAPA is now actively working to award the contracts to remediate the site to residential standards per the work plan and ADEQ.





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.



Figure 13- Mesa Substation Vault Basement

Project Status

- Environmental service contract award anticipated in FY2016
- Projected completion of field activities April 2017
- Projected completion of close-out October 2017

	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]
				[A+B+C]		[D-E]		[D+G]
Funding Summary	Original Project Budget	Prepayment Adjustments	Appropriations Adjustments	Current Project Budget	Total Executed	Remaining Funds	Additional Funds Required	Revised Project Budget
Prepayment	1,025,000	2,510,000	-	3,535,000	2,740,235	794,765	-	3,535,000
Appropriations	-	-	755,909	755,909	755,909	-	-	755,909
Total Project Funding	1,025,000	2,510,000	755,909	4,290,909	3,496,145	794,765	-	4,290,909

Executions include expenses, obligations, and commitments through 8/09/16





5.5 Tucson Substation Rebuild

This project will completely rebuild the 115kV substation located in Tucson. Land within the existing Substation fence will be utilized to construct the new substation prior to the demolition of the existing station. Many of the components are 1950’s vintage and have exceeded their normal operating life span. This Substation contains the breaker in the worst condition at DSW as indicated by an Asset Management assessment.

Project Status

- All Government Furnished Equipment has been purchased & delivered:
 - Disconnect Switches, instrument transformers, Power Circuit Breakers, Steel Pole Structures
- A construction contract has been awarded for \$4.2M
- Construction activities projected to start in October 2016
- Projected completion of construction December 2017
- Projected completion of close-out June 2018

Funding	Original Project Budget	Prepayment Adjustments	Appropriations Adjustments	[A+B+C] Current Project Budget	Total Executed	[D-E] Remaining Funds	Additional Funds Required	[D+G] Revised Project Budget
Prepayment	7,000,000	-	-	7,000,000	4,782,309	2,217,691	-	7,000,000
Appropriations	-	-	1,757,868	1,757,868	1,757,868	-	-	1,757,868
Total Project Funding	7,000,000	-	1,757,868	8,757,868	6,540,176	2,217,691	-	8,757,868

Executions include expenses, obligations, and commitments through 8/09/16



Figure 14- Existing Tucson Substation and Location of New Yard





5.6 Parker 161kV Switch Replacement (Canceled)

WAPA proposes the cancellation of the Parker 161kV Switch Replacement Project to further evaluate the regional needs of the Parker transmission system. If approved, this would result in the return of approximately \$1.2 million pre-payment dollars to the Parker-Davis Project.

This project and others associated with the Parker 69kV, 161kV, & 230kV substations were previously placed on hold, to evaluate the collective impacts on the Parker area transmission system. After further studies it has been determined that additional transmission planning analysis is needed. In an effort to incorporate the transmission needs of our customers in the Parker area, WAPA has created a South of Parker Planning Charter group. This sub-regional, transmission planning forum will identify interested parties long term transmission needs and assure a high degree of reliability in joint planning, development, and operations of the Bulk Electric System (BES).

It is with these considerations that WAPA proposes the cancellation of this project in lieu of a potentially lengthy on-hold status. Once adequate analysis of the greater Parker transmission system has concluded, WAPA will present new projects to address the known and developing maintenance related issues related to Parker Substation.



Figure 15- Parker 161 kV Yard





BACKGROUND

Project consist of replacing (12) 161kV switches, two with grounding switches in bays 5, 7, 8, 12 at the Parker 161kV Substation. The switches are 50 plus years old and have become difficult to operate. Routine maintenance has been performed but because of their age and the normal degradation these switches have become unreliable and pose a potential safety hazard to maintenance personnel. Additionally their unreliability can prolong outages and create an uncertainty to systems operations.

Project Status

- Approved for pre-payment funding in FY14
- No Equipment has been purchased to date
- Project is being suspended and pre-payment funds released

	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]
Funding Summary				[A+B+C]		[D-E]		[D+G]
Funding	Original Project Budget	Prepayment Adjustments	Appropriations Adjustments	Current Project Budget	Total Executed	Remaining Funds	Additional Funds Required	Revised Project Budget
Prepayment	1,250,000	-	-	1,250,000	24,940	1,225,060	-	1,250,000
Appropriations	-	-	-	-	-	-	-	-
Total Project Funding	1,250,000	-	-	1,250,000	24,940	1,225,060	-	1,250,000

Executions include expenses, obligations, and commitments through 8/09/16

5.7 Facility Ratings Mitigation Year 3 (Canceled)

Approved for pre-payment funding in FY15, the Facility Ratings Mitigation Year 3 project was placed on hold last year pending Analysis of Alternatives (AoA) Studies in the South of Parker and South of Phoenix areas. Upon further evaluation WAPA is proposing the cancellation of this project which will release \$16 million in available pre-payment funding for other projects. Project executions to date will be expensed under an Operations and Maintenance account and the project formally closed. WAPA will continue to address the violations associated with Facility Ratings Year 3 with individual sub-projects, which incorporate other emerging issues like extensive wood pole replacement, re-conductor work, and/or other project efforts currently proposed in the Ten-Year Plan.

BACKGROUND

The National American Electric Reliability Corporation (NERC) issued an order that all transmission operators verify all lines of 100kV or higher, are in compliance with the National Electrical Safety Code (NESC). This was driven by tree caused outages throughout the United States. The order allowed the operator to establish high (Year 1), medium (Year 2) and low (Year 3) priorities. These priorities were mostly driven by voltage class, 500kV and 345kV high, 230kV medium and 161kV and 115kV low. After each priority had been surveyed, NERC required a report with the findings and a mitigation plan for the deficiencies.

Facility Ratings Year 3 consisted of a total of 939 miles of lines which was LiDAR surveyed, resulting in 499 potential violations. Field verification identified that 151 violations required an engineered/design solution. The mitigation of these violations on each line segment requires the solicitation of a construction contract. This project will require significant outages coordination and most likely will be built over two construction seasons.





Project Status

- No Equipment purchased to date
- Project is being cancelled and pre-payment funds released

	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]
Funding Summary				[A+B+C]		[D-E]		[D+G]
Funding	Original Project Budget	Prepayment Adjustments	Appropriations Adjustments	Current Project Budget	Total Executed	Remaining Funds	Additional Funds Required	Revised Project Budget
Prepayment	16,000,000		-	16,000,000	99,075	15,900,925	-	16,000,000
Appropriations	-	-		-		-	-	-
Total Project Funding	16,000,000	-	-	16,000,000	99,075	15,900,925	-	16,000,000

Executions include expenses, obligations, and commitments through 8/09/16

5.8 Parker - Headgate Rock & Parker- Bouse 161kV Reroute

This transmission line re-route project consists of replacing the existing line from Parker to Headgate Rock, part of the Parker to Blythe system, and from Parker to Bouse, part of the Parker to Gila system. The rebuild will upgrade the existing wooden pole structures that are currently showing signs of advanced degradation, having exceeded their useful life cycle and will require replacement.

A new 230kV transmission system replacing the existing 161kV circuits had been originally proposed, but considering load demand and system forecasting models in the service region, an in-kind 161kv system will now be 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 the California side of the Colorado River. Once across the river, single circuit transmission lines will be constructed 3 miles southeast to connect 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 re-use of existing rights-of-way in an effort to control and reduce total cost to the project.

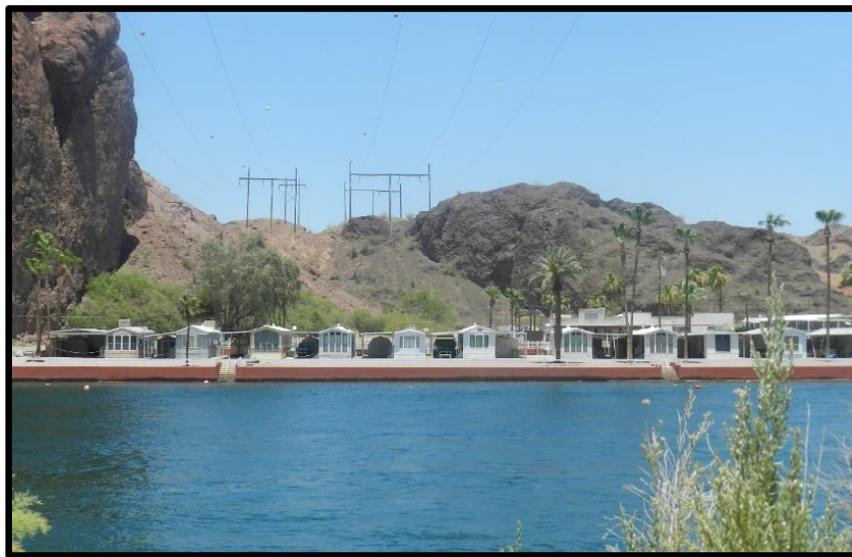


Figure 16- Right-of-way along the Parker-Bouse/Headgate Rock 161kV lines





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. With the proposed new crossing, there are currently three river crossing alternatives (one being the current) being reviewed through the NEPA process and one other WAPA feasibility survey of existing use of rights-of-way. The next step for WAPA is to obtain new environmental survey data, revise complete environmental studies, as well as revise and complete the draft design. WAPA is continuing to coordinate with CRIT to advance the project while also investigating other new alignment options that will still meet the purpose and needs of the project.

Project Status

- Project is subject to being placed on-hold upon the completion of the design package
- In April 2016 CRIT requested that the river crossing on their land be relocated further upstream
- Construction phase will be on hold until the total project budget is revalidated on an established design and routing plan
- Negotiations for access to CRIT land for the environmental work and cost discussions for the new CRIT easements that WAPA will need to complete the project are still in progress
- WAPA is investigating new alignment options to reduce cost and project scope
- WAPA meets with CRIT on September 8th to continue project discussions
- No Government Furnished Equipment (GFE) has been purchased to date

	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]
Funding Summary				[A+B+C]		[D-E]		[D+G]
Funding	Original Project Budget	Prepayment Adjustments	Appropriations Adjustments	Current Project Budget	Total Executed	Remaining Funds	Additional Funds Required	Revised Project Budget
Prepayment	17,954,000	(334,176)	-	17,619,824	410,364	17,209,460	-	17,619,824
Appropriations	-	-	806,463	806,463	806,463	-	-	806,463
Total Project Funding	17,954,000	(334,176)	806,463	18,426,288	1,216,827	17,209,460	-	18,426,288

Executions include expenses, obligations, and commitments through 8/09/16

5.9 Gila Substation 161kV Rebuild

This project will completely rebuild the Gila 161kV Substation to 230kV standard and re-use existing 161kV transformers. The rebuild will be on WAPA owned land adjacent to the existing substation. In addition to the rebuild, a new control building will be built to accommodate the future rebuild of the 69kV and 34.5kV yards. The Gila Substation (161kV, 69kV, 34.5kV and 4.16kV) was originally constructed in 1949. The rebuild of this substation will increase reliability and will also replace aged components that have become unreliable and a detriment to the WAPA System. In 1949 when the substation was originally built, safe working and minimum approach distances were considerably less than today’s standards. The rebuild to current day standards will increase worker safety and lessen the possibility of equipment flashover and failure.

**PLEASE SEE “FY17 PROPOSED NEW PROJECTS” SECTION FOR A COMPLETE FINANCIAL SUMMARY*

Project Status

- Additional pre-payment funds are requested for FY17 in the amount of \$6,299,184
- WAPA acquired perpetual land rights from Bureau of Land Management





Project Status Continued

- GFE purchased to date
 - (9) 245kV Power Circuit Breakers
 - 34.5kV Transformer
 - Steel Pole Structures
 - Protection & Communication Equipment
- Protection & Communication work has completed at Knob, Kofa, Wellton Mohawk Ligurta



Figure 17- Existing Gila 161KV Yard

5.10 Gila- Knob 161kV Rebuild

This project will replace the existing 161kV circuit with 3,500-feet of new 230kV transmission line; which will be operated at 161kV initially. This project is being performed in conjunction with APS and their new transmission line in the corridor connecting WAPA's Gila and APS's North Gila substations. Structures 4/7 to 5/2 will be built to double circuit standards using steel monopoles and overhead optical ground wire for future connection at Knob Switching Station. An existing 100-foot' right-of-way will be used for the rebuilt circuits, except where conditions prevent vertical conductor orientation, such as under APS's 500kV lines. This requires extensive outage coordination with APS.

**PLEASE SEE "FY17 PROPOSED NEW PROJECTS" SECTION FOR A COMPLETE FINANCIAL SUMMARY*

Project Status

- Equipment purchased to date: steel poles & conductor
 - (9) Steel Poles \$1,117,650
 - Conductor \$209,150
- ROW acquisition completed





Project Status Continued

- Construction design & specifications are complete
- Construction contract solicitation was issued, then cancelled due to magnitude of bid estimates
- Additional Pre-payment funds are requested for FY17 in the amount of \$1,117,811





6. FY17 Proposed New Projects

6.1 Proposed Pre-payment Funding Plan

WAPA's proposed pre-payment funding plan for FY17 will reduce the overall prepayment program by \$9,990,950. This is the result of the cancellation and reprogramming of pre-payment funds associated with the Facility Ratings Mitigation Year 3 project and the Parker Substation 161kV Switch Replacement Project. The total project cost to date (See Table #1 below) for each project will be transferred and expensed under an O&M account and formally closed. Table #2 below summarizes the FY17 Pre-payment funding plan with sources and uses across recently completed projects, canceled projects, and proposed projects.

Active Projects	Approved Pre-payment Funds	Pre-payment Executions To Date
Facility Ratings Year 3 Budget	\$16,000,000	\$99,075
Parker Substation Switch Replacement	\$1,250,000	\$24,940
TOTAL	\$17,250,000	\$124,015

Table #1 – Data as of 8/9/16

FY17 Pre-payment Funding Plan			
Action	Project Name	Sources	Uses
Completed	Pinnacle Peak-Rogers Right-of-Way	108,091	
Completed	Del Bac-Nogales Right-of-Way Renewal	49,854	
Reprogram	ED2-ED4 115kV Transmission Line Rebuild	500,000	
Reprogram	Gila-Knob 161kV Rebuild		500,000
Cancel	Parker Substation 161kV Switch Replacement	1,250,000	
Cancel	Facility Ratings Mitigation Year 3	16,000,000	
Proposed	Gila Substation 161kV Rebuild		6,299,184
Proposed	Gila-Knob 161kV Rebuild		1,117,811
	New Prepayment Funding Needed	(9,990,950)	
	FY17 Prepayment	7,916,995	7,916,995

Table #2 – Data as of 8/9/16

6.2 Gila Substation 161kV Rebuild

EXECUTIVE SUMMARY

The Gila Substation 07 project was started in 2013 and has had several design evolutions to ensure the reliability of present and future customer's needs. The project design and rebuild is predicated on safety and dependability of the bulk electrical system from a substation that is 67 years old. Many upgrades are required due to equipment age or incompatibility with newer equipment, as well as the project being





expanded from a 3 bay system to a 4 bay system, allowing for consistent system reliability and minimal outage disruption during maintenance work.

As with a majority of the projects, the preliminary project scope of work was viewed as a guide to determine the cost of the project. Budget outlines were based on similar projects and WAPA's experience with similar construction projects. When the project was approved by customers, and design began, the project's scope of work became more detailed as the equipment and construction requirements were defined, causing large deviations from the initial pre-design budget.

As the design neared completion, it became evident the original budget proposal was not sufficient for the construction of Gila 07 substation and additional funding would be needed to complete the project. Presently, there is a need for an additional \$6,299,184, as outlined in the project summaries below.

BACKGROUND

The Gila Substation was originally constructed in 1949 and operates at 161kV, 69kV, 34.5kV, and 4.16kV. All the yards are arranged in a main-and-transfer configuration outside of the 4.16kV yard. The 161kV yard was originally constructed in 1949 along with the 34.5kV yard, which was expanded in 1999.

The new 161kV yard will be built in a breaker and half configuration, operating at 161kV, while being constructed to 230kV standards. This allows for future increased energy requirements with minimal disruption of service. The existing 161kV yard will be demolished once the new 161kV system is operational to create space for the reconstruction of the 69kV and 34.5kV yards, as both yards are in poor condition and present safety risks to equipment and personnel, due to a lack of proper clearances to perform routine maintenance work, requiring WAPA to take outages on adjacent bays.

During our design study, existing power circuit breakers, current transformers and coupling capacitor voltage transformers were found to be inadequate because of their amperage ratings, thus requiring the purchase of new equipment. A new service building will be erected to house the operational equipment and a transformer will be installed to ensure reliability for the Yuma-Mesa pumping plant and operation of the substation. Components of the substation include battery systems and chargers, vertical switch boards, cable trays, and a control room.

Additionally, the present communication system is analog based and WAPA now operates on a digital configuration. To meet this requirement, upgrades at three relay sites and Gila substation are needed. All proposed construction changes are meant to ensure system reliability, minimize repair and construction interruptions, and contain future costs.

BUDGET EXPLANATION

The estimated budget was prepared three years in advance and was not updated to account for newer technology, aging equipment or inflation. Since then it has been discovered that approximately \$500,000 has been spent on maintenance in the last five years. We consider the maintenance costs excessive, indicating aging equipment which requires replacement parts that are not easily acquired. Our present design is based





on dependability for our customers, along with developing and designing for future needs. The requirement to perform detailed assessments of equipment conditions, as well as taking time to analyze substation options to provide our customers years of continuous reliability, took time and became a priority.

In order to ensure a reliable transmission, with minimal disruptions, WAPA has taken an active approach to develop a substation that required changes to our original considerations, with the stakeholders' welfare and long term transmission requirements in mind. By building the four bay 161kV yard to the present design and installing an additional 34.5-kV transformer, reliability for the pumping plant, and the region in general will be greatly enhanced. The proposed construction will have greater reliability than the existing 161kV yard, due to the fact that it will be constructed in a breaker-and-a-half arrangement and the transformers will be configured in parallel, ensuring a constant energy source. The new yard will also have higher amperage capacity, which will ensure WAPA and stakeholders' future system requirements are met.

Another vital area considered was the communications aspect. The existing system is an outdated analog system which needs to be updated to digital for safety and reliability reasons. This required the purchase of new technology necessary for communications with our operations division.

The improved substation will relieve the need for lengthy outages during future expansion activities, meaning disruption of transmission will be negligible. In general, the breaker-and-a-half configuration with new equipment and fewer maintenance demands will increase the reliability of WAPA's system for all customers in the region. The new communication system will provide protection of our equipment, while providing consistent, dependable power delivery.





FINANCIAL SUMMARY – PROJECT BUDGET CATEGORIES

- **Administration**

Costs associated with project management and support functions related to the administration of construction projects to include: general supplies and services, construction planning, collection of field data, procurement and contract administration, safety, and finance administration.

- **Design**

Costs associated with creating the design and specifications of construction projects.

- **Environmental**

Costs associated with compliance with the National Environmental Policy Act, Toxic Substances Control Act, Resource Conservation and Recovery Act, Clean Air Act, Clean Water Act to include: cultural surveys and monitoring, biological surveys and monitoring, asbestos abatement, storm water, oil-filled equipment disposal, hazardous waste disposal, etc.

- **Right-of-Way**

Costs associated with the acquisition of right-of-way, easements, etc.

- **Construction**

Costs associated with the construction contract and inspection services.

- **Government Furnished Equipment (GFE)**

Costs associated with the procurement of structures, station equipment (breakers, transformers, etc.), towers, wood poles, steel poles, conductor, Supervisory Control and Data Acquisition (SCADA) equipment, microwave equipment, fixed radio equipment, and fiber optics equipment. These items are often procured by the government and provided to the contractor to mitigate long lead times.

- **Commissioning Activity**

Costs associated with the energization and commissioning of the assets into service including: communications, SCADA, and operations.

- **Contingency**

Amounts held in reserve to mitigate unknown project risks.

- **Interest during Construction (IDC)**

Interest is calculated annually and at the end of the project and is included in the total project cost used to calculate rates. IDC is not included in the project budget.



Gila Substation 161-kV Rebuild Project Summary

Budget vs. Execution Summary

Category	Original Project Budget	% of Original Budget	Revised Project Budget	% of Revised Budget	Executed to Date (as of 8/9/2016)					
					Commitments	Obligations	Expenses	Total Executed	% of Original Budget Executed	% of Revised Budget Executed
Administration	1,185,308	10%	1,679,500	9%	6,897	35,053	442,890	484,840	41%	29%
Design	569,992	5%	1,300,000	7%	40	-	1,176,857	1,176,897	206%	91%
Environmental	57,595	0%	125,000	1%	-	-	109,738	109,738	191%	88%
Right-of-Way	-	0%	35,000	0%	-	-	27,819	27,819	N/A	79%
Government Furnished Equipment	1,875,800	16%	4,363,400	23%	5,048	1,300,017	816,919	2,121,983	113%	49%
Construction	6,843,405	57%	7,956,800	42%	138	-	11,778	11,916	0%	0%
Commissioning Activity	1,467,900	12%	2,630,300	14%	11,587	-	371,368	382,955	26%	15%
Contingency	-	0%	904,500	5%	-	-	-	-	N/A	0%
Total Project (Excluding IDC)	12,000,000	100%	18,994,500	100%	23,710	1,335,070	2,957,369	4,316,149	36%	23%
Interest During Construction ^{1/}	N/A	N/A	N/A	N/A	-	-	25,792	25,792	N/A	N/A
Total Project (Including IDC)					23,710	1,335,070	2,983,161	4,341,941		

Funding Summary

	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]
				[A+B+C]		[D-E]		[D+G]
Funding	Original Project Budget	Prepayment Adjustments ^{2/}	Appropriations Adjustments ^{3/}	Current Project Budget	Total Executed (Excluding IDC)	Remaining Funds	Additional Funds Required ^{4/}	Revised Project Budget
Prepayment	12,000,000	(1,075,597)	-	10,924,403	2,545,236	8,379,167	6,299,184	17,223,587
Appropriations	-	-	1,770,913	1,770,913	1,770,913	-	-	1,770,913
Total Project Funding	12,000,000	(1,075,597)	1,770,913	12,695,316	4,316,149	8,379,167	6,299,184	18,994,500

^{1/} Interest during construction (IDC) is a non-cash entry which does not impact the project budget, however, it is a cost of the project when the asset is capitalized

^{2/} Prepayment funding was reduced due to the use of available available construction appropriations in lieu of construction prepayments

^{3/} Appropriated funding was increased due to the use of available construction appropriations in lieu of construction prepayments

^{4/} Please refer to project handout for explanation of project cost increases

Gila Substation 161-kV Rebuild Project Detail

Budget vs. Execution Detail

Budget vs. Execution Detail							Executed to Date (as of 8/9/2016)					
							Commitments	Obligations	Expenses	Total Executed	% of Original Budget Executed	% of Revised Budget Executed
Category	Task	Task Description	Original Project Budget	% of Original Budget	Revised Project Budget	% of Revised Budget						
Administration	30001	General Engineering Supply Services	-	0%	-	0%	-	-	-	-	N/A	N/A
Administration	30010	Construction Planning	-	0%	-	0%	-	-	4,216	4,216	N/A	N/A
Administration	30012	Collection of Field Data	-	0%	-	0%	-	-	76,468	76,468	N/A	N/A
Administration	30015	Procurement & Contract Admin	-	0%	-	0%	-	-	5,253	5,253	N/A	N/A
Administration	30016	Safety Inspections	-	0%	-	0%	-	-	-	-	N/A	N/A
Administration	30022	Project Management	-	0%	-	0%	6,897	35,053	347,467	389,416	N/A	N/A
Administration	30023	Finance Administration	-	0%	-	0%	-	-	9,487	9,487	N/A	N/A
Administration			1,185,308	10%	1,679,500	9%	6,897	35,053	442,890	484,840	41%	29%
Design	30013	Design and Specs	569,992	5%	1,300,000	7%	40	-	1,176,857	1,176,897	206%	91%
Environmental	30011	Environmental Activities	57,595	0%	125,000	1%	-	-	109,738	109,738	191%	88%
Right-of-Way	35000	Land & Land Rights	-	0%	-	0%	-	-	27,819	27,819	N/A	N/A
Right-of-Way	35900	Roads & Road Structures	-	0%	-	0%	-	-	-	-	N/A	N/A
Right-of-Way			-	0%	35,000	0%	-	-	27,819	27,819	N/A	79%
Government Furnished Equipment	35210	Structures & Improvements-Bldgs	-	0%	-	0%	-	-	-	-	N/A	N/A
Government Furnished Equipment	35220	Structures & Improvements-Other	-	0%	-	0%	-	-	-	-	N/A	N/A
Government Furnished Equipment	35300	Station Equipment	-	0%	-	0%	5,048	1,300,017	471,959	1,777,023	N/A	N/A
Government Furnished Equipment	35400	Towers & Fixtures	-	0%	-	0%	-	-	-	-	N/A	N/A
Government Furnished Equipment	35510	Wood Poles & Fixtures	-	0%	-	0%	-	-	-	-	N/A	N/A
Government Furnished Equipment	35520	Steel Poles & Fixtures	-	0%	-	0%	-	-	344,960	344,960	N/A	N/A
Government Furnished Equipment	35600	Overhead Conductors	-	0%	-	0%	-	-	-	-	N/A	N/A
Government Furnished Equipment	35700	Underground Conduit	-	0%	-	0%	-	-	-	-	N/A	N/A
Government Furnished Equipment	35800	Underground Conductor (15-35kV)	-	0%	-	0%	-	-	-	-	N/A	N/A
Government Furnished Equipment	39710	SCADA Equipment	-	0%	-	0%	-	-	-	-	N/A	N/A
Government Furnished Equipment	39720	Microwave Equipment	-	0%	-	0%	-	-	-	-	N/A	N/A
Government Furnished Equipment	39760	Fixed Radio Equipment	-	0%	-	0%	-	-	-	-	N/A	N/A
Government Furnished Equipment	39770	Fiber Optics Equipment	-	0%	-	0%	-	-	-	-	N/A	N/A
Government Furnished Equipment			1,875,800	16%	4,363,400	23%	5,048	1,300,017	816,919	2,121,983	113%	49%
Construction	30014	Construction Supervision	-	0%	-	0%	138	-	11,778	11,916	N/A	N/A
Construction	30100	Principal Contract	-	0%	-	0%	-	-	-	-	N/A	N/A
Construction			6,843,405	57%	7,956,800	42%	138	-	11,778	11,916	0%	0%
Commissioning Activity	30021	Commissioning Activity	1,467,900	12%	2,630,300	14%	11,587	-	371,368	382,955	26%	15%
Contingency	N/A	N/A	-	0%	904,500	5%					N/A	0%
Total Project (Excluding IDC)			12,000,000	100%	18,994,500	100%	23,710	1,335,070	2,957,369	4,316,149	36%	23%



6.3 Gila-Knob 161kV Rebuild

EXECUTIVE SUMMARY

WAPA is presently investigating the additional costs required for the completion of this project. We will review our original budget versus existing execution, as well as any additional funding requests that are necessary to complete the proposed project. WAPA received bids for the Gila Knob 161kV Rebuild in July, 2016, and the lowest bidder for the project was considerably higher than the WAPA independent government estimate. Due to the large disparity between the government estimate and the bids received, the budget was insufficient for this project to be awarded. The financial summary that follows currently represents an estimated total project cost and is therefore subject to change based upon further investigation. WAPA is working to solidify the total project cost in time for the October 4th Pre-payment Customer Presentation at which time cost drivers will be further identified.

BACKGROUND

In 2013, customers in the Yuma area came out in support of upgrades to the Gila-Knob line around North Gila Substation in a letter dated July 7, 2013. Upgrading the line from 161kV to 230kV was encouraged to avoid “future costly facility incompatibilities” with APS. APS was adding a third 500kV circuit into North Gila and was beginning work on two additional 230kV circuits between North Gila and Yucca. WAPA worked APS from 2012 through 2014 to include the GLA-KNB upgrades that the customers sought into the North Gila-Orchard-Yucca 230kV construction, but negotiations concluded in 2014 without an agreement. However, WAPA was supplied with \$2M in prepayment funding for the upgrades in 2014.

A decision for WAPA to move forward with the project independently was made in late 2014 and the project kicked-off in April 2015. The Gila-Knob voltage upgrade encouraged by the Yuma-area customers and funded using prepayments will include future provisions for a second 230kV circuit.

PROJECT SCOPE

Between structures 4/7 and 5/2, the Gila-Knob line was re-routed by APS in 1982, when the North Gila Substation was constructed. The re-routed section skirts the edge of APS’ North Gila Substation and crosses under three APS 500-kV lines which enter the substation from the northeast. Between structures 4/9 and 4/11, the Gila-Knob line lies on insufficient ROW (less than 100-feet) wedged between the Gila Gravity Canal and North Gila Substation. It is physically encroached-upon by a canal waste bank on the northeast side and a steep concrete-lined slope on the southwest. The ROW in this area will need to be enlarged to accommodate the double circuit 230kV, horizontal conductor configuration. Remaining sections (4/7-4/8 and 4/10-5/2) will be built for double circuit 230kV, with only one circuit being installed using a vertical conductor configuration on the existing 100-foot ROW. Between structures 4/8 and 4/10, the structures will be installed in a horizontal configuration to allow for proper clearance under the 500kV APS line and a double circuit of high strength, high temperature conductor will be installed, with one phase being grounded, in preparation for future use. Re-building structures 4/7 to 5/2 and improving the ROW between 4/9 and 4/11 is considered Phase I. It is approximately 0.70 miles in length and will include an OPGW for future communications.





FINANCIAL SUMMARY – PROJECT BUDGET CATEGORIES

- **Administration**

Costs associated with project management and support functions related to the administration of construction projects to include: general supplies and services, construction planning, collection of field data, procurement and contract administration, safety, and finance administration.

- **Design**

Costs associated with creating the design and specifications of construction projects.

- **Environmental**

Costs associated with compliance with the National Environmental Policy Act, Toxic Substances Control Act, Resource Conservation and Recovery Act, Clean Air Act, Clean Water Act to include: cultural surveys and monitoring, biological surveys and monitoring, asbestos abatement, storm water, oil-filled equipment disposal, hazardous waste disposal, etc.

- **Right-of-Way**

Costs associated with the acquisition of right-of-way, easements, etc.

- **Construction**

Costs associated with the construction contract and inspection services.

- **Government Furnished Equipment (GFE)**

Costs associated with the procurement of structures, station equipment (breakers, transformers, etc.), towers, wood poles, steel poles, conductor, Supervisory Control and Data Acquisition (SCADA) equipment, microwave equipment, fixed radio equipment, and fiber optics equipment. These items are often procured by the government and provided to the contractor to mitigate long lead times.

- **Commissioning Activity**

Costs associated with the energization and commissioning of the assets into service including: communications, SCADA, and operations.

- **Contingency**

Amounts held in reserve to mitigate unknown project risks.

- **Interest during Construction (IDC)**

Interest is calculated annually and at the end of the project and is included in the total project cost used to calculate rates. IDC is not included in the project budget.



Gila-Knob 161-kV Double Circuit Upgrade Project Summary

Budget vs. Execution Summary

Category	Original Project Budget	% of Original Budget	Revised Project Budget	% of Revised Budget	Executed to Date (as of 8/9/2016)					
					Commitments	Obligations	Expenses	Total Executed	% of Original Budget Executed	% of Revised Budget Executed
Administration	148,133	7%	817,300	19%	965	26,294	409,017	436,276	295%	53%
Design	49,235	2%	277,900	6%	142	711	161,162	162,015	329%	58%
Environmental	29,492	1%	123,200	3%	641	-	99,248	99,889	339%	81%
Right-of-Way	-	0%	35,000	1%	508	-	31,047	31,555	N/A	90%
Government Furnished Equipment	540,000	27%	1,304,750	30%	-	1,301,075	3,672	1,304,747	242%	100%
Construction	1,200,000	60%	1,514,950	35%	138	-	3,336	3,474	0%	0%
Commissioning Activity	-	0%	5,650	0%	-	-	-	-	N/A	0%
Contingency	33,140	2%	203,600	5%	-	-	-	-	0%	0%
Total Project (Excluding IDC)	2,000,000	100%	4,282,350	100%	2,393	1,328,080	707,482	2,037,955	102%	48%
Interest During Construction ^{1/}	N/A	N/A	N/A	N/A	-	-	19,468	19,468	N/A	N/A
Total Project (Including IDC)					2,393	1,328,080	726,950	2,057,423		

Funding Summary

	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]
				[A+B+C]		[D-E]		[D+G]
Funding	Original Project Budget	Prepayment Adjustments ^{2/}	Appropriations Adjustments ^{3/}	Current Project Budget	Total Executed (Excluding IDC)	Remaining Funds	Additional Funds Required ^{4/}	Revised Project Budget
Prepayment	2,000,000	500,000	-	2,500,000	1,373,416	1,126,584	1,117,811	3,617,811
Appropriations	-	-	664,539	664,539	664,539	-	-	664,539
Total Project Funding	2,000,000	500,000	664,539	3,164,539	2,037,955	1,126,584	1,117,811	4,282,350

^{1/} Interest during construction (IDC) is a non-cash entry which does not impact the project budget, however, it is a cost of the project when the asset is capitalized

^{2/} In accordance with the Prepayment Process MOU, \$500K was reprogrammed from the ED4-ED2 115-kV Transmission Line Rebuild project

^{3/} Appropriated funding was increased due to the use of available construction appropriations in lieu of construction prepayments

^{4/} Please refer to project handout for explanation of project cost increases

Gila-Knob 161-kV Double Circuit Upgrade Project Detail

Budget vs. Execution Detail

Budget vs. Execution Detail							Executed to Date (as of 8/9/2016)					
							Commitments	Obligations	Expenses	Total Executed	% of Original Budget Executed	% of Revised Budget Executed
Category	Task	Task Description	Original Project Budget	% of Original Budget	Revised Project Budget	% of Revised Budget						
Administration	30001	General Engineering Supply Services	-	0%	-	0%	-	-	94	94	N/A	N/A
Administration	30010	Construction Planning	-	0%	-	0%	-	-	9,218	9,218	N/A	N/A
Administration	30012	Collection of Field Data	-	0%	-	0%	-	-	103,707	103,707	N/A	N/A
Administration	30015	Procurement & Contract Admin	-	0%	-	0%	-	-	6,638	6,638	N/A	N/A
Administration	30016	Safety Inspections	-	0%	-	0%	-	-	-	-	N/A	N/A
Administration	30022	Project Management	-	0%	-	0%	965	26,294	289,360	316,619	N/A	N/A
Administration	30023	Finance Administration	-	0%	-	0%	-	-	-	-	N/A	N/A
Administration			148,133	7%	817,300	19%	965	26,294	409,017	436,276	295%	53%
Design	30013	Design and Specs	49,235	2%	277,900	6%	142	711	161,162	162,015	329%	58%
Environmental	30011	Environmental Activities	29,492	1%	123,200	3%	641	-	99,248	99,889	339%	81%
Right-of-Way	35000	Land & Land Rights	-	0%	-	0%	508	-	31,047	31,555	N/A	N/A
Right-of-Way	35900	Roads & Road Structures	-	0%	-	0%	-	-	-	-	N/A	N/A
Right-of-Way			-	0%	35,000	1%	508	-	31,047	31,555	N/A	90%
Government Furnished Equipment	35210	Structures & Improvements-Bldgs	-	0%	-	0%	-	-	-	-	N/A	N/A
Government Furnished Equipment	35220	Structures & Improvements-Other	-	0%	-	0%	-	-	-	-	N/A	N/A
Government Furnished Equipment	35300	Station Equipment	-	0%	-	0%	-	-	-	-	N/A	N/A
Government Furnished Equipment	35400	Towers & Fixtures	-	0%	-	0%	-	-	-	-	N/A	N/A
Government Furnished Equipment	35510	Wood Poles & Fixtures	-	0%	-	0%	-	-	-	-	N/A	N/A
Government Furnished Equipment	35520	Steel Poles & Fixtures	-	0%	-	0%	-	1,118,650	3,672	1,122,322	N/A	N/A
Government Furnished Equipment	35600	Overhead Conductors	-	0%	-	0%	-	182,425	-	182,425	N/A	N/A
Government Furnished Equipment	35700	Underground Conduit	-	0%	-	0%	-	-	-	-	N/A	N/A
Government Furnished Equipment	35800	Underground Conductor (15-35kV)	-	0%	-	0%	-	-	-	-	N/A	N/A
Government Furnished Equipment	39710	SCADA Equipment	-	0%	-	0%	-	-	-	-	N/A	N/A
Government Furnished Equipment	39720	Microwave Equipment	-	0%	-	0%	-	-	-	-	N/A	N/A
Government Furnished Equipment	39760	Fixed Radio Equipment	-	0%	-	0%	-	-	-	-	N/A	N/A
Government Furnished Equipment	39770	Fiber Optics Equipment	-	0%	-	0%	-	-	-	-	N/A	N/A
Government Furnished Equipment			540,000	27%	1,304,750	30%	-	1,301,075	3,672	1,304,747	242%	100%
Construction	30014	Construction Supervision	-	0%	-	0%	138	-	3,175	3,313	N/A	N/A
Construction	30100	Principal Contract	-	0%	-	0%	-	-	161	161	N/A	N/A
Construction			1,200,000	60%	1,514,950	35%	138	-	3,336	3,474	0%	0%
Commissioning Activity	30021	Commissioning Activity	-	0%	5,650	0%	-	-	-	-	N/A	0%
Contingency	N/A	N/A	33,140	2%	203,600	5%					0%	0%
Total Project (Excluding IDC)			2,000,000	100%	4,282,350	100%	2,393	1,328,080	707,482	2,037,955	102%	48%



6.4 Gila-Wellton Mohawk 161kV Rebuild (Interstate 8 Crossing & Telegraph Pass Rebuild)



Figure 18 Gila-Wellton Mohawk Structures 6/7 thru 9/8

EXECUTIVE SUMMARY

Proposed for fiscal year (FY) 2017 is the start of the Gila-Wellton Mohawk (GLA-WML) 161kV transmission line rebuild project. WAPA plans to start project planning and design in FY17 using a budget of \$500,000 in appropriated funding. This will allow WAPA to develop a more detailed project budget utilizing an established design. This budget will support federal and contract labor associated with elements of planning, design, environmental, lands, and pre-construction activities. If additional appropriations cannot be secured to fund the remainder of the project, then the pre-payment funds would be requested in fiscal year 2018.

CONCEPTUAL PROJECT FUNDING PLAN		
PHASE	COST ESTIMATE	FUND TYPE
1- Initiation, Planning & Design	\$500,000	Appropriations
2- Construction & Close-out	\$4,722,400	TBD
PRE-DESIGN ESTIMATED TOTAL	\$5,222,400	

ANALYSIS OF ALTERNATIVES STUDY

WAPA performed an Analysis of Alternatives (AoA) study on the Gila-Wellton Mohawk (GLA-WML) 161kV transmission line to investigate and provide an assessment of potential modifications. The area of investigation includes the GLA-WML transmission line where it crosses Interstate 8 (I-8), and travels 2.8 miles west through Telegraph Pass.





The functional requirement of this study was to evaluate a North American Electric Reliability Corporation (NERC) violation, and other emerging issues in the vicinity of that violation. Those issues include the isolated pole structures between the eastbound and westbound lanes of I-8, improving the I-8 crossing structures reliability, replacing a number of failing wood pole structures within the rugged terrain of Telegraph Pass, and reestablishing access to the right-of-way. These issues must be addressed to reduce risk to WAPA and its customers in regards to transmission reliability and public safety along the line segment.

This study reviewed six alternatives for the replacement of 27 wood pole structures and it was determined that the preferred option was upgrading to heavy duty steel mono-pole structures constructed by helicopter. Hereafter referred to as alternative 4a.

JUSTIFICATION FOR PROJECT

The original wooden structures on the Gila-Wellton Mohawk Transmission Line have been in service since 1950. Of the 244 wood poles on this line segment, 226 (93%) have been rejected using Polux® testing data in conjunction with the National Electric Safety Code (NESC) standards as having insufficient fiber strength (<65%). Most of the wood poles display visual symptoms of advanced external shell rot, along with weathering and large cracks. This outer layer damage makes it unsafe for line personnel to climb the poles and perform maintenance. Consequently maintenance personnel are forced to use bucket trucks to access pole tops.



Figure 19 - Interstate 8 Crossing Structures





Since some of this line is located in remote desert pass areas, or difficult terrain, it can be difficult or impossible to get heavy equipment near the structures to perform required maintenance work without substantial provisions. Of the 27 failing or damaged wooden pole structures in the evaluation area, four were located at the I-8 crossings and one was identified as NERC violation due to phase to ground clearance.

Right-of-way access is also a significant issue along this line segment. Access roads to structures need to be repaired or in some cases created, unless a helicopter is used for construction and maintenance. The highway crossings structures specifically needs replacement and the lack of any access roads to the crossing structures makes maintenance or replacement impossible without significant coordination with the Arizona Department of Transportation (ADOT) for interstate off ramp provisions. This limited access poses huge risk in light of any potential emergency repairs or replacements needed at this location.

RECOMMENDATION (Gila-Wellton Mohawk Rebuild)

Alternatives investigated in this AoA:

All alternatives with the exception of Helicopter installations will require that the 2.8 miles of right-of-way access roads be repaired or in some cases created where access was lost due to Interstate 8 modifications through telegraph across Bureau of Land Management property.

1. Alternative 1- Status Quo
2. Alternative 2- Replacement of structures with In-Kind Wood structures, re-conductor.
3. Alternative 3- Replacement of structures with wood equivalent steel H-frame structures, re-conductor.
4. Alternative 3a- Replacement of structures with wood equivalent steel H-frame structures, Construct using a helicopter.
5. Alternative 4- Replacement of structures with heavy duty steel mono-pole structures.
6. **Alternative 4a- Replacement of structures with heavy duty steel mono-pole structures, Construct using a helicopter.**

Preferred Scope - Alternative #4a

This scope encompasses the replacement of existing wood pole structures with heavy duty steel mono-pole structures. The replacement work would be performed via helicopter due to difficult terrain restrains common in the area. This alternative is the most cost effective and meets WAPA's objectives as it removes the need to construct new ROW roads, access roads, or an I-8 off ramp in conjunction with ADOT. It also allows the use of WAPA's current environmental CX clearance and alleviates the need for a potential Environmental Assessment (EA) requirement which would prove time consuming and costly.

Preliminary design evaluations anticipate that larger span lengths between the steel mono-pole structures will decrease the number of structures needed from 71, down to 20. This reduces the amount of foundations being drilled in extremely rocky terrain, therefore reducing construction cost. WAPA will also save approximately one year in the conceptual construction schedule by utilizing helicopter construction methods, existing ROW, and steel mono-poles, when compared with competing alternatives.

Alternative 4a meets mission need by improving reliability, reducing maintenance demands, increasing public safety, mitigating a NERC violation, and increasing the life span of WAPA's assets. And although not a direct





requirement, if future capacity is needed, this alternative will allow for future conductor upgrades without changing structures, providing potential future cost savings.

Alternatives considered but deemed unviable:

- A “No Action – Status Quo” alternative was not considered given the unacceptable risk associated with the lack of access to damaged/failing wood pole structures and the lack of right-of-way access for emergency repairs.
- Alternative 1- Under this alternative, WAPA maintenance forces would continue to replace failed wood poles with replacements in kind upon failure. The scope of this option includes cost incurred from land acquisition, development, and associated clearances for environmental, biological, and cultural surveys. The construction of access roads and right-of-way would also occur with this option for a total conceptual cost of \$5.2 million and 13 months to complete. This effort would not include any provisions to fix the NERC violation. Unknowns in ROW changes and environmental findings with a new ROW could add millions of dollars to the conceptual costs.
- Alternative 2- Under this Alternative the 27 wood structures (71 wood poles total) showing the need for replacement in Polux studies or maintenance inspection will be removed and replaced in-kind with new wood pole structures and re-conducted with equivalent conductor. The 2.8 miles of required access roads to structures will require that a new right-of-way roadway be established. This option’s conceptual cost is \$8.1 million and requires 19 months to complete, it fixes the NERC violation and addresses the safety concerns of the line segment. This option provides vehicular access to all new wood poles and WAPA’S has the tools and skills to replace wood poles.
- Alternative 3- Under this Alternative the 27 wood structures (71 wood poles total) showing the need for replacement will be removed and replaced with wood equivalent steel H-frame structures via a new access road. A re-conductor with same size conductor is anticipated with this alternative method of pole replacement. The 2.8 miles of required access paths to the structures will require that a new right-of-way roadway be established. The conceptual cost is \$9.1 million and requires 19 months to complete, it fixes the NERC violation, and addresses the safety concerns of the line segment. This option provides vehicular access to all new steel poles. WAPA’S maintenance does not have the tools or ability to replace metal poles.
- Alternative 3a- Under this Alternative the 27 wood structures (71 wood poles) showing the need for replacement will be removed and replaced with like design using wood equivalent steel H-frame structures via helicopter. A re-conductor with same size conductor is anticipated with this alternative method of pole replacement. This option’s conceptual cost is \$8.4 million and requires 19 months to complete, it fixes the NERC violation and addresses the safety concerns of the line segment. This option will not provide vehicular access to all new steel poles. WAPA’S maintenance will need to use a helicopter and they do not have the tools or ability to replace metal poles.





- Alternative 4- Under this Alternative the 27 wood structures (71 wood poles total) showing the need for replacement will be removed and replaced with an estimated 20 steel monopole structures via a new access road. A re-conductor with same size conductor is anticipated with this pole replacement. The 2.8 miles of required access roads to the structures will require that a new right-of-way roadway be established. This option's conceptual cost is \$9.9 million and requires 15 months to complete, it fixes the NERC violation and addresses the safety concerns of the line segment. This option provides vehicular access to all new steel poles. WAPA'S maintenance does not have the tools or ability to replace the steel monopoles.

ASSUMPTIONS, CONSTRAINTS, & LIMITATIONS (Gila-Wellton Mohawk Rebuild)

- Heavy duty steel mono-pole structures will allow for fewer structures to be used and design improvements to be made.
- Structures will be replaced after Right of Way (ROW) access roads are verified.
- Civil design work will come from DSW G5620.
- No optical ground wire (OPGW) is required, if Kofa-Dome Tap-Wellton Mohawk receives OPGW
- No new land purchase.
- Drilled holes and installation take 4 men for 4 days per hole via helicopter
- Drilled holes and installation take 3 men for 3 days per hole with finished Right of Way access roads.
- Helicopter used 10 hours per hole
- WAPA will have to execute installations through a contractor since installations require special equipment.
- WAPA DSW crews are not equipped to erect and install Heavy duty steel mono-pole structures.





7. Retirements Replacements and Additions (RRADs)

7.1 Overview

RRADs 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 RADDs program.

7.2 RRADs Budget

Power System	Boulder Canyon	CAP	CRSP	Intertie	Parker Davis	Salinity	Levee
FY16 Executed As of 7-31-16	\$52,444	\$8,855,733	\$1,778,279	\$1,901,736	\$6,005,921	\$204,839	\$49,578
FY17	\$1,240,000	\$12,206,600	\$4,220,859	\$2,920,000	\$8,222,000	\$0	\$5,283,491
FY18	\$250,000	\$10,450,000	\$4,619,064	\$4,215,000	\$7,476,064	\$0	\$684,000
FY19	\$400,000	\$2,200,000	\$5,320,000	\$1,920,000	\$7,278,238	\$0	\$689,000
FY20	\$400,000	\$400,000	\$3,535,000	\$1,890,000	\$7,546,497	\$0	\$0





7.3 RRADs FY16 Funds Executed By Power System (>\$200,000)

**Executed as of 7/31/16*

Central Arizona Project (CAP)	
Hassayampa Tap	\$ 802,376
ED2-Saguaro #2 115kV Rebuild	\$ 7,858,737
Colorado River Storage Project (CRSP)	
Pinnacle Peak KU1A Transformer Replacements	\$ 372,324
Pinnacle Peak/Rogers Install Double Circuit Inset Structure Lines 1 & 2	\$ 318,019
Glen Canyon Drainage and Waterline Upgrades	\$ 363,005
<u>Intertie</u>	
Mead Upgrade for Erosion Control	\$ 421,580
Mead Phoenix 500kV Line	\$ 400,000
<u>Parker-Davis</u>	
Pinnacle Peak/Rogers Install Double Circuit Inset Structure Lines 1 & 2	\$ 306,845
PHS Cooling Tower Fan Upgrade	\$ 383,803
Wood Pole Program	\$ 1,618,099
Parker KX6A and KX4A Transformer Bushing Replacement	\$ 601,562





7.4 RRADs Projects by Power System for FY17 (>\$200,000)

<u>Boulder Canyon</u>	
Hoover- Mead 1 thru 8 Jumper Replacement	\$ 1,140,000
<u>Central Arizona Project (CAP)</u>	
Hassayampa Tap	\$ 7,450,000
ED2-Saguaro #2 115kV Rebuild	\$ 4,500,000
<u>Colorado River Storage Project (CRSP)</u>	
Pinnacle Peak 230kV Disconnect Replacements Bays 23 & 33	\$ 200,000
Pinnacle Peak Replacement of FX Capacitor Maintenance Breakers	\$ 600,000
Pinnacle Peak PRC-002-2 DME Upgrades & Team Additions	\$ 200,000
Pinnacle Peak Relay Replacements - Transformer (KU1A & KU2A)	\$ 200,000
Comm Site Building Replacement (ED5 Building)	\$ 382,000
Glen Canyon Erosion and Waterline Project	\$ 500,000
Pinnacle Peak /Rogers Install Double Circuit Inset Structure Lines 1 & 2	\$ 458,859
Flagstaff/ Pinnacle Peak /Glen Canyon Physical Security Enhancement Program	\$ 1,300,000
<u>Intertie</u>	
Mead/ Pinnacle Peak /Liberty Physical Security Upgrade	\$ 1,000,000
Mead Phoenix 500kV Line	\$ 1,500,000
<u>Parker-Davis</u>	
Phoenix Main Facility Building SCADA Hardware/Software	\$ 350,000
PHS Roof Upgrade - Phoenix Main Facility Building	\$ 594,000
Wood Pole Program	\$ 2,235,141
Parker KX6A and KX4A Trans. Bushing Replacement	\$ 700,000
Bucket Truck (Replace 125ft Altec)	\$ 675,000
6X4 Tractor	\$ 200,000
White Tank Mountain/Metal Mountain DACs Replacements	\$ 250,000
WIN/CIP (Various)	\$ 200,000
Pinnacle Peak /Rogers Install Double Circuit Inset Structure Lines 1 & 2	\$ 458,859
Saguaro-Tucson Structure 30-5 Steel Pole Replacement	\$ 500,000
Phoenix Main Facility Building/Blythe/Parker/Davis/Coolidge/Liberty Physical Security Upgrade	\$ 500,000
<u>Levee</u>	
Gila-Gila Valley Lateral Rebuilds	\$ 5,044,000
Gila-North Gila Laterals 69kV Rebuild	\$ 239,491





THANK YOU



DSW Ten Year Plan - Construction Projects

REF #	PROJECT	System	Type	Key	Fund	Notes	PCN Budget ^{5/}	Approp. Executed to Date	Total Project Budget ^{5/}	Estimate FY17-26 ^{5/}	Actual Cost Thru July 2016	PROJECTED TOTAL ^{5/}	FY23		FY24			FY25			FY26			
													23N	23TOT	24PD	24N	24TOT	25PD	25N	25TOT	26PD	26N	26TOT	
1	Parker Substation 161kV Switch Replacement	GGPD	Subs	GGPDSubs	PCN	Canceled - Return of Prepayment Funds	1,250		1,250		25	25												
2	Facility Rating Mitigation Year 3 (Low Priority)	GGPD	T-Line	GGPDT-Line	PCN	Canceled - Return of Prepayment Funds	16,000		16,000		99	99												
3	Parker Substation 161kV Breaker Replacement	GGPD	Subs	GGPDSubs	WCF	On Hold- Pending Study Effort		1,168	1,168		1,168	1,168												
4	Gila-Knob Transmission Line Litigation	GGPD	T-Line	GGPDT-Line	WCF	Complete - Close-out Legal Delays		2,025	2,025	145	2,025	2,170												
5	Parker-Headgate Rock/Bouse 161kV Reroute	GGPD	T-Line	GGPDT-Line	PCN	Active - Planning/Design Only	17,620	806	18,426	17,209	1,217	18,426												
6	Black Point Mesa Reroute	GGPD	T-Line	GGPDT-Line	PCN	Complete - Close-out Legal Delays	1,326	974	2,300	164	2,136	2,300												
7	Mead Substation Stage 15	GGIN	Subs	GGINSubs	WCF	In Closeout		7,971	7,971	150	7,971	8,121												
8	Mead CCVTs Structure Replacement	GGIN	Subs	GGINSubs	PCN	In Closeout		975	975	128	847	975												
9	ED2-ED4 115-kV Transmission Line Rebuild	GGPD	T-Line	GGPDT-Line	PCN	In Closeout	2,287	4,899	7,186	108	7,078	7,186												
10	Mesa Substation Remediation	GGPD	Subs	GGPDSubs	PCN	Active	3,535	756	4,291	795	3,496	4,291												
11	Gila-North Gila, Gila-Knob 161kV T-Line Reroute	GGPD	T-Line	GGPDT-Line	PCN	Active	3,618	665	4,283	2,245	2,038	4,283												
12	Facility Rating Mitigation Year 2 (Medium Priority)	GGPD	T-Line	GGPDT-Line	PCN	Active	8,525	385	8,910	1,140	7,770	8,910												
13	Gila-Gila Valley 34.5kV Laterals Rebuild	GGCL	T-Line	GGCLT-Line	WMF	Active		58	5,384	5,326	58	5,384												
14	Gila Substation 161kV to 230kV Rebuild	GGPD	Subs	GGPDSubs	PCN	Active	17,224	1,771	18,995	14,679	4,316	18,995												
15	Tucson Substation Rebuild	GGPD	Subs	GGPDSubs	PCN	Active	7,000	1,758	8,758	2,218	6,540	8,758												
16	Liberty Series Capacitor Bank Replacement	GGIN	Subs	GGINSubs	PCN	Active	10,372		10,372	10,364	8	10,372												
17	Crossman Peak Microwave Facility	GGPD	Comm	GGPDComm	PCN	Active	4,525		4,525	3,985	540	4,525												
18	Gila-Wellton Mohawk Interstate-8 Crossing Rebuild	GGPD	T-Line	GGPDT-Line	WCF	Proposed FY17 Start (Planning/Design Only)	5,222		5,222	5,222		5,222												
20	Kofa-Dome Tap 161kV Rebuild	GGPD	T-Line	GGPDT-Line	WCF	Projected FY18 Start			4,730	4,730		4,730												
21	Dome Tap-Gila 161kV Rebuild	GGPD	T-Line	GGPDT-Line	WCF	Projected FY18 Start			7,336	7,336		7,336												
22	Mead Substation Replace Transformer (KU2A)	GGIN	Subs	GGINSubs	WCF	Projected FY18 Start			4,550	4,550		4,550												
23	Bouse-Kofa 161kV Rebuild	GGPD	T-Line	GGPDT-Line	WCF	Projected FY19 Start			31,100	31,100		31,100												
24	Parker-Blythe 161kV #2 Rebuild	GGPD	T-Line	GGPDT-Line	WCF	AoA Study Pending			45,000	45,000		45,000	900	1,350	450		450							
25	Blythe-Gold Mine Tap 161kV Rebuild	GGPD	T-Line	GGPDT-Line	WCF	AoA Study Pending			30,000	30,000		30,000	14,400	15,600	300	600	900	300			300			
26	Gold Mine Tap Knob 161kV Rebuild	GGPD	T-Line	GGPDT-Line	WCF	AoA Study Pending			15,000	15,000		15,000					450							
27	Parker Substation 161kV Rebuild	GGPD	T-Line	GGPDT-Line	WCF	AoA Study Pending			10,500	10,500		10,500					315							
28	Gila-Wellton Mohawk (remaining 161kV rebuild)	GGCR	Subs	GGCRSubs	WCF	AoA Study Pending			5,200	5,200		5,200	2,600	2,912	156		156							
29	Blythe-Headgate Rock #1 line 161kV Rebuild	GGPD	T-Line	GGPDT-Line	WCF	AoA Study Pending			23,900	23,900		23,900	9,560	10,277	956	11,472	12,428	239	478	717	239		239	
30	Rogers-Coolidge 230kV Reconductor	GGPD	T-Line	GGPDT-Line	WCF	AoA Study Pending			6,000	6,000		6,000	2,040	2,460	360	3,000	3,360	180		180				
31	Oracle- Saguaro 115kV Rebuild (230kV)	GGPD	Subs	GGPDSubs	WCF	AoA Study Pending			8,200	8,200		8,200				574	2,788	3,362	492	4,100	4,592	246	246	
													29,500	33,675	2,796	17,860	20,656	1,211	4,578	5,789	485	485		

^{1/} PD values reflect Federal and Non-Construction Contractor Labor

^{2/} NPD Values Reflect Equipment and Construction Costs

^{3/} PF = Previous Pre-payment Collection Pending Funding Approval

^{4/} PC = Previous Pre-payment Collection Approved

^{5/} Values include Unapproved FY17 Pre-payment Requested Funds

Planning Assumptions for Projects That Have Not Completed AoA Study Phase:

Project start dates are scheduled based on urgency derived from MDCC priority ranking and projected available funding and resources

AoA Studies are conducted under O&M

Prior to AoA Study Completion, Total Project Cost Is Strictly High Level

Prior to AoA Study Completion, Project Fiscal Year Projections are Calculated Using Spend Plan Profiles (See charts on right)

SUBS Planning Spend-Plan Profile (% of Total Project Cost)

Program (PD)		Non-Program (NPD)	
Year 1	5%	Year 1	
Year 2	10%	Year 2	29%
Year 3	13%	Year 3	35%
Year 4	5%	Year 4	1%
Year 5	2%	Year 5	

T-LINES <\$20M Planning Spend-Plan Profile (% of Total Project Cost)

Program (PD)		Non-Program (NPD)	
Year 1	7%	Year 1	34%
Year 2	6%	Year 2	50%
Year 3	3%	Year 3	

T-LINES >\$20M Planning Spend-Plan Profile (% of Total Project Cost)

Program (PD)		Non-Program (NPD)	
Year 1	1%	Year 1	
Year 2	3%	Year 2	40%
Year 3	4%	Year 3	48%
Year 4	1%	Year 4	2%
Year 5	1%	Year 5	

Prepayment Project Status as of 8/9/16

	Project	Status	Year Approved	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	Revised Prepayment Budget	Prepayment Executed to Date	Available Prepayment Funds	Appropriations Executed to Date	TOTAL Executed to Date
1	Thornton Road - Empire - ED5 Transmission Line Rebuild	Complete	FY10	28,500,000		(3,118,252)	(11,555,836)			(688,494)		13,137,418	13,137,418	-	-	13,137,418
2	ED4-ED5 Transmission Line Rebuild	Complete	FY11		14,982,000		(7,000,000)			(900,879)		7,081,121	7,081,121	-	-	7,081,121
3	Rebuild Davis 230-kV Switchyard (Davis Stage 06)	Complete	FY11		-							-	-	-	-	-
4	Coolidge Substation 230/69-kV Transformer	Complete	FY12			6,110,000	79,277	(495,841)	(332,966)	119,039		5,479,509	5,479,509	-	4,714,142	10,193,651
5	Bouse Substation 161-kV Rebuild	Complete	FY12			4,970,000	1,027,919	(3,618,770)		(44,002)		2,335,147	2,335,147	-	8,677,570	11,012,717
6	ED4-ED2 115-kV Transmission Line Rebuild	Close-Out	FY12			11,100,000				(8,312,920)	(500,000)	2,287,080	2,178,699	108,382	4,898,805	7,077,504
7	Pinnacle Peak-Rogers Right-of-Way	Complete	FY13				6,200,000				(108,091)	6,091,909	6,091,909	-	116,975	6,208,884
8	Parker-Headgate Rock	Under Review	FY13				17,954,000			(334,176)		17,619,824	410,364	17,209,460	806,463	1,216,827
9	Parker-Davis Facility Rating Mitigation Year 2	Active	FY14/15					3,225,000	5,300,000			8,525,000	7,385,656	1,139,344	384,603	7,770,259
10	Parker-Davis Facility Rating Mitigation Year 3	On Hold	FY15						16,000,000		(16,000,000)	-	99,075	(99,075)	-	99,075
11	Black Point-Mesa Transmission Line Reroute	Close-Out	FY14					1,855,500		(529,916)		1,325,584	1,161,812	163,773	973,958	2,135,769
12	Mesa Substation Remediation	Active	FY14/16					1,025,000		2,510,000		3,535,000	2,740,235	794,765	755,909	3,496,145
13	Gila-Knob 161-kV Double Circuit Upgrade	Active	FY14					2,000,000			1,617,811	3,617,811	1,373,416	2,244,395	664,539	2,037,955
14	Parker Substation 161-kV Switch Replacement	On Hold	FY14					1,250,000			(1,250,000)	-	24,940	(24,940)	-	24,940
15	Mead CCVT Support Structure Repalcement	Close-Out	FY14					975,000				975,000	847,141	127,859	-	847,141
16	Gila Substation 161-kV Rebuild	Active	FY14					12,000,000		(1,075,597)	6,299,184	17,223,587	2,545,236	14,678,351	1,770,913	4,316,149
17	Del Bac-Nogales Right-of-Way Renewal	Close-Out	FY15						3,550,000		(49,854)	3,500,146	3,500,146	-	-	3,500,146
18	Tucson Substation Rebuild	Active	FY15						7,000,000			7,000,000	4,782,309	2,217,691	1,757,868	6,540,176
19	Crossman Peak Microwave Facility	Active	FY16							4,525,000		4,525,000	540,493	3,984,507	-	540,493
20	Liberty Series Capacitor Bank	Active	FY16							10,372,000		10,372,000	7,591	10,364,409	-	7,591
	PROJECT TOTALS			28,500,000	14,982,000	19,061,748	6,705,360	18,215,889	31,517,034	5,640,056	(9,990,950)	114,631,136	61,722,217	52,908,919	25,521,744	87,243,961

* Executed to date amounts include commitments, outstanding obligations and expenses as of 8/9/2016



9. Appendices

9.1 Table of Acronyms

APS.....	ARIZONA PUBLIC SERVICE
BOR.....	BUREAU OF RECLAMATION
CAP.....	CENTRAL ARIZONA PROJECT
CX.....	CATEGORICAL EXCLUSION
CIP.....	CRITICAL INFRASTRUCTURE PROTECTION
DOE.....	DEPARTMENT OF ENERGY
SW.....	DESERT SOUTHWEST REGION
EA.....	ENVIRONMENTAL ASSESSMENT
GFE.....	GOVERNMENT FURNISHED EQUIPMENT
IDIQ.....	INDEFINITE DELIVERY/INDEFINITE QUANTITY
IFB.....	INVITATION FOR BID
KCMIL.....	THOUSANDS CIRCULAR MILLIMETER
MDCC.....	MANAGEMENT DESIGN CONSTRUCTION COMMITTEE
NEPA.....	NATIONAL ENVIRONMENTAL POLICY ACT
NERC.....	NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION
NESC.....	NATIONAL ELECTRIC SAFETY CODE
NHPA.....	NATIONAL HISTORIC PRESERVATION ACT
NRHP.....	NATIONAL REGISTER OF HISTORIC PLACES
PAD.....	PARKER POWER PLANT
PCB.....	POLYCHLORINATED BIPHENYL
PCN.....	PRE-PAYMENT FUNDS
RFP.....	REQUEST FOR PROPOSAL
ROW.....	RIGHT OF WAY
SCE.....	SOUTHERN CALIFORNIA EDISON
SF6.....	SULFUR HEXAFLUORIDE
TCP.....	TRADITIONAL CULTURAL PROPERTIES
USDA.....	UNITED STATES DEPARTMENT OF AGRICULTURE
WAPA.....	WESTERN AREA POWER ADMINISTRATION
WCF.....	WESTERN CONSTRUCTION FUNDS





9.2 DSW FY17-21 Capital RRADS Program

FY17 - FY26 DESERT SOUTHWEST RRADs CAPITAL PROGRAM												
REF. NO.	PROJECT DESCRIPTION	ORG	FY17 BUDGET SUBMISSION	FY18 BUDGET SUBMISSION	FY19 BUDGET PLAN	FY20 BUDGET PLAN	FY21 BUDGET PLAN	FY22 BUDGET PLAN	FY23 BUDGET PLAN	FY24 BUDGET PLAN	FY25 BUDGET PLAN	FY26 BUDGET PLAN
BOULDER CANYON												
1	Transformer Relay Replacements	G53	\$100,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	Relay Replacements - Line & Transfer Breaker	G53	\$0	\$200,000	\$200,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
G5300 TOTALS			\$100,000	\$200,000	\$200,000	\$0						
3	Hoover- Mead 1 thru 8 Jumper Replacement	G56	\$1,140,000	\$50,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
G5600 TOTALS			\$1,140,000	\$50,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	Outyear projects - TED		\$0	\$0	\$200,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000
BOULDER CANYON TOTALS			\$1,240,000	\$250,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000
CENTRAL ARIZONA PROJECT												
1	"SPH" - HVAC Unit Replacement	G52	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	Outyear projects - TED	G52	\$0	\$0	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
G5200 TOTALS			\$0	\$0	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
3	Fiber Optic - Cisco Equipment	G53	\$200,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	Outyear projects - TED	G53	\$0	\$0	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
G5300 TOTALS			\$200,000	\$0	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
5	Facility Rating Mitigation Second Year	G56	\$56,600	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	Hassavampa Tap	G56	\$7,450,000	\$3,450,000	\$1,300,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	Transmission Line Replacement	G56	\$4,500,000	\$7,000,000	\$500,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
G5600 TOTALS			\$12,006,600	\$10,450,000	\$1,800,000	\$0						
CAP TOTALS			\$12,206,600	\$10,460,000	\$2,200,000	\$400,000						
LEVEE												
1	Gila-Gila Valley Lateral Rebuilds	G56	\$5,044,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	Gila-North Gila 69KV Rebuild	G56	\$239,491	\$684,000	\$689,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
G5600 TOTALS			\$5,283,491	\$684,000	\$689,000	\$0						
LEVEE TOTALS			\$5,283,491	\$684,000	\$689,000	\$0						
COLORADO RIVER STORAGE PROJECT												
1	Test Equipment	G52	\$60,000	\$120,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000
2	Bucket Truck	G52	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	230kV Disconnect Replacements Bays 23 and 33	G52	\$200,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	Replacement of FX Capacitor Maintenance Breakers	G52	\$600,000	\$350,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	HVAC Upgrades	G52	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	PPK KU1A Transformer Gasket Replacements	G52	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
G5200 TOTALS			\$860,000	\$470,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000
G53 - Protection Projects												
7	Meter Replacement - Glen Canyon Visitor Center	G53	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	Meter Replacement - Revenue & Panel	G53	\$0	\$150,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	Meter Replacement - Revenue & Panel	G53	\$0	\$0	\$175,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	Meter Replacement - Revenue & Panel	G53	\$0	\$0	\$0	\$50,000	\$0	\$0	\$0	\$0	\$0	\$0
11	Meter Replacement - Revenue & Panel	G53	\$0	\$0	\$0	\$0	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
12	PRC-002-2 DME Upgrades & Team Additions	G53	\$200,000	\$175,000	\$0	\$200,000	\$0	\$0	\$0	\$0	\$0	\$0
13	PRC-002-2 DME Upgrades & Team Additions	G53	\$0	\$0	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
14	Relay Replacements - Line & RTU (RTAC)	G53	\$0	\$0	\$0	\$300,000	\$0	\$0	\$0	\$0	\$0	\$0
15	Relay Replacements - Line Relays, 69KV	G53	\$0	\$200,000	\$250,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	Relay Replacements - RAS/Unit Dropping	G53	\$100,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	Relay Replacements - Transfer Breaker & Bus Diff	G53	\$0	\$190,000	\$210,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	Relay Replacements - Transformer (KU1A & KU2A)	G53	\$200,000									
19	Relay Replacements - Line/Transformer	G53	\$0	\$0	\$0	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
G53 - Communication Projects												
20	Comm Site Building Replacement (ED5 Building) With Environmental	G53	\$382,000	\$100,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
21	Comm Site Building Replacement With Environmental	G53	\$0	\$0	\$70,000	\$800,000	\$0	\$0	\$0	\$0	\$0	\$0
22	Microwave Upgrades With Environmental	G53	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
23	Microwave Upgrades With Environmental	G53	\$50,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
24	Glen Canyon Microwave Tower Replacement	G53	\$0	\$0	\$0	\$50,000	\$500,000	\$0	\$0	\$0	\$0	\$0
25	Power System Replacement	G53	\$0	\$0	\$0	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
26	RTU Replacement (Consolidate RTU)	G53	\$0	\$0	\$150,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
27	RTU Replacement (RTAC)	G53	\$0	\$0	\$0	\$0	\$150,000	\$0	\$0	\$0	\$0	\$0





REF. NO.	PROJECT DESCRIPTION	ORG	FY17 BUDGET SUBMISSION	FY18 BUDGET SUBMISSION	FY19 BUDGET PLAN	FY20 BUDGET PLAN	FY21 BUDGET PLAN	FY22 BUDGET PLAN	FY23 BUDGET PLAN	FY24 BUDGET PLAN	FY25 BUDGET PLAN	FY26 BUDGET PLAN
28	RTU Replacements (Communication Sites)	G53	\$0	\$0	\$85,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
29	RTU Replacements (Communication Sites)	G53	\$0	\$0	\$0	\$85,000	\$0	\$0	\$0	\$0	\$0	\$0
30	RTU Replacements (Communication Sites)	G53	\$0	\$0	\$0	\$0	\$85,000	\$85,000	\$85,000	\$85,000	\$85,000	\$85,000
31	WIN/CIP (Relay Access & Compliance)	G53	\$20,000	\$20,000	\$20,000	\$20,000	\$0	\$0	\$0	\$0	\$0	\$0
G6300 TOTALS			\$952,000	\$835,000	\$1,160,000	\$1,955,000	\$1,235,000	\$585,000	\$585,000	\$585,000	\$585,000	\$585,000
32	230/69kV-50 MVA Transformer Stage 09	G56	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
33	GC Erosion and Waterline Project	G56	\$500,000	\$2,000,000	\$100,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
34	*GC* - Drainage & Waterline Upgrades Temp Fix	G56	\$150,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
35	Pinnacle Peak-Replace Shunt Cap Bank	G56	\$0	\$760,000	\$3,800,000	\$1,520,000	\$1,140,000	\$380,000	\$0	\$0	\$0	\$0
36	Install Double Circuit Inset Structure Lines 1 & 2	G56	\$458,858	\$54,064	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
37	Physical Security Enhancement Program	G56	\$1,300,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
38	Glen Canyon to Shiprock 60Mvar 230kV Reactors	G56	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
39	KV2D 24/4-kV Transformer Replacement	G56	\$0	\$500,000	\$200,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
G6000 TOTALS			\$2,408,858	\$3,314,064	\$4,100,000	\$1,520,000	\$1,140,000	\$380,000	\$0	\$0	\$0	\$0
CRSP TOTALS			\$4,220,858	\$4,619,064	\$5,320,000	\$3,535,000	\$2,435,000	\$1,025,000	\$645,000	\$645,000	\$645,000	\$645,000
SALINITY												
1	Wellfield - Transformer	G52	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	HVAC Unit Replacement	G52	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
G6200 TOTALS			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	Knob Relay, Meter, and RTU Upgrade - Desalter Line	G53	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	Communication System Additions	G53	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
G6300 TOTALS			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
SALINITY TOTALS			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
INTERTIE												
1	Test Equipment	G52	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000
2	Breaker Replacement 1582	G52	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	*MED* - HVAC Unit Replacement	G52	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	Mead Upgrade for Erosion Control	G52	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
G6200 TOTALS			\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000
G63 - Protection Projects												
5	Relay Replacements - Bus PW3A/230kV	G53	\$100,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	Relay Replacements - Basler	G53	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	Relay Replacements - Transformer (KW17B) 230/69kV	G53	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	Meter Replacement - Revenue & Panel	G53	\$0	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
9	PRC-002-2 DME Upgrades & Team Additions	G53	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$0	\$0	\$0	\$0
10	PRC-002-2 DME Upgrades & Team Additions	G53	\$0	\$0	\$0	\$0	\$0	\$0	\$100,000	\$100,000	\$100,000	\$100,000
11	Relay Replacements - Transformer (KTIA)	G53	\$30,000	\$330,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	Relay Replacements - Basler and Transformer (KU2A)	G53	\$70,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	Relay Replacements - Line/Transformer	G53	\$0	\$0	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
G63 - Communication Projects												
14	Power System Replacement	G53	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	WIN/CIP	G53	\$30,000	\$20,000	\$30,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
G6300 TOTALS			\$330,000	\$500,000	\$380,000	\$350,000						
16	Physical Security Upgrade	G56	\$1,000,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
17	Cap Bank - PU1A	G56	\$50,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
18	Lone Butte Structure	G56	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
19	Razor Wire Project	G56	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
20	Breaker Replacement 182	G56	\$0	\$500,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
21	Breaker Replacement 1386	G56	\$0	\$500,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
22	Liberty Substation Outer Fence	G56	\$0	\$575,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
23	230kV Breaker & Pad Replacements for UB 182 & 1386 (TAM), (planning; est 2018)	G56	\$0	\$600,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
24	Mead Substation Domestic Water Main Replacement	G56	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
G6600 TOTALS			\$1,050,000	\$2,175,000	\$0							
25	Mead Phoenix 500kV Line	G61	\$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	\$1,500,000
G6100 TOTALS			\$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	\$1,500,000
INTERTIE TOTALS			\$2,920,000	\$4,215,000	\$1,920,000	\$1,890,000						
PARKER DAVIS												
1	SCADA Hardware/Software	A27	\$350,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000
J2000 TOTALS			\$350,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000
2	Upgrade APO Parking Lot	G10	\$106,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0





REF. NO.	PROJECT DESCRIPTION	ORG	FY17 BUDGET SUBMISSION	FY18 BUDGET SUBMISSION	FY19 BUDGET PLAN	FY20 BUDGET PLAN	FY21 BUDGET PLAN	FY22 BUDGET PLAN	FY23 BUDGET PLAN	FY24 BUDGET PLAN	FY25 BUDGET PLAN	FY26 BUDGET PLAN
3	Cooling Tower Upgrade	G10	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	Roof Upgrade - Phoenix Main Facility Building	G10	\$594,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	Replace Cooling Tower Fans	G10	\$0	\$55,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	Replace HVAC Units for Warehouse	G10	\$0	\$50,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	Fitness Center Shower Hot Water Heaters	G10	\$0	\$45,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	Covered Parking Lighting	G10	\$0	\$100,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	Front Gate Replacement for Phoenix Facility	G10	\$0	\$250,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	Facility Project - TBD	G10	\$0	\$0	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000
G1000 TOTALS			\$700,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000
11	Replace Cisco 2821 (8)	A26	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12	Replace Cisco 7208 (1)	A26	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	Wireless	A26	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
14	Expansion of Arcon Switch	A26	\$30,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	Tools for CIP V5	A26	\$108,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	ASA 5501 and 5520 Firewall Replacement	A26	\$42,000	\$189,000	\$189,450	\$208,373	\$218,791	\$229,731	\$241,217	\$253,278	\$260,000	\$260,000
17	CIO Layer 2 Switches - Data Center	A26	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$30,000	\$30,000
18	CIO Layer 2 Switches - Substations	A26	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$22,000	\$22,000
19	CIO Replace Cisco 2821 (10)	A26	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$50,000	\$50,000
20	VMHW Servers Prod	A26	\$0	\$40,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
21	VMHW Servers QA	A26	\$0	\$20,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
22	Core Switch Upgrade	A26	\$0	\$0	\$360,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
23	Backup Library	A26	\$0	\$0	\$94,600	\$0	\$0	\$0	\$0	\$120,809	\$120,809	\$120,809
24	Karitan	A26	\$0	\$0	\$38,288	\$0	\$0	\$0	\$0	\$48,887	\$48,887	\$48,887
25	San Replacement	A26	\$0	\$0	\$0	\$273,124	\$0	\$0	\$0	\$0	\$0	\$0
A2600 TOTALS			\$180,000	\$249,000	\$691,238	\$481,497	\$218,791	\$229,731	\$241,217	\$422,754	\$531,476	\$531,476
26	Test Equipment	G52	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000
27	Wood Pole Program (Locations only FY16)	G52	\$2,295,141	\$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
28	Pressure Digger	G52	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
29	ACC Power Ascender	G52	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
30	Compact Telehandler (2)	G52	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
31	HVAC Unit Replacement	G52	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
32	PAD KX6A and KX4A Trans. Bushing Replacement	G52	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
33	FLIR T1K Thermal Imaging Camera	G52	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
34	Bucket Truck (Replace 125ft Altec)	G52	\$675,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
35	6x4 Tractor	G52	\$200,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
36	Replace 954 AAC Jumpers at Nogales (currently rated at 185 MVA) with new conductor rated at 188 MVA or higher	G52	\$30,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
37	230kV Oil Breaker Replacement PAD 482 (TAM), purchase 2018, install 2019 (contingent upon construction PAD Rebuild project)	G52	\$160,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
38	230kV Oil Breaker Replacement PAD 482 (TAM), purchase 2018, install 2019 (contingent upon construction PAD Rebuild project)	G52	\$160,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
39	230kV Oil Breaker Replacement PAD 782 (TAM), purchase 2018, install 2019 (contingent upon construction PAD Rebuild project) - Omitted from Oct 2015 sheet	G52	\$0	\$0	\$175,000	\$200,000	\$0	\$0	\$0	\$0	\$0	\$0
40	Pressure Digger	G52	\$0	\$500,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
41	Aerial Lift 80ft	G52	\$0	\$120,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
42	Aerial Lift 80ft	G52	\$0	\$140,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
43	Bucket Truck 40 ft (2-each)	G52	\$0	\$150,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
44	Distribution Line Truck	G52	\$0	\$336,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
45	Compact Telehandler	G52	\$0	\$100,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
46	UTV (2-each)	G52	\$0	\$30,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
47	MOPV - TBD	G52	\$0	\$0	\$500,000	\$750,000	\$1,000,000	\$1,000,000	\$950,000	\$900,000	\$900,000	\$900,000
G5200 TOTALS			\$3,580,141	\$4,496,000	\$3,795,000	\$4,070,000	\$4,120,000	\$4,120,000	\$4,070,000	\$4,020,000	\$4,020,000	\$4,020,000
48	Test Equipment	G53	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
G53 - Protection Projects												
49	DCS Upgrades	G53	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
50	DMS Upgrades	G53	\$54,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
51	Meter Program	G53	\$0	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
52	PRC-002-2 DME Upgrades & Team Additions	G53	\$100,000	\$100,000	\$100,000	\$100,000	\$0	\$0	\$0	\$0	\$0	\$0
53	PRC-002-2 DME Upgrades & Team Additions	G53	\$0	\$0	\$0	\$0	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
54	Pumping Plant Upgrades	G53	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
55	Relay Replacements - Basler	G53	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
56	Relay Replacements - Line	G53	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
57	Relay Replacements - Line	G53	\$50,000	\$100,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
58	Relay Replacements - Line	G53	\$50,000	\$100,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
59	Relay Replacements - Substation	G53	\$150,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0





REF. NO.	PROJECT DESCRIPTION	ORG	FY17 BUDGET SUBMISSION	FY18 BUDGET SUBMISSION	FY19 BUDGET PLAN	FY20 BUDGET PLAN	FY21 BUDGET PLAN	FY22 BUDGET PLAN	FY23 BUDGET PLAN	FY24 BUDGET PLAN	FY25 BUDGET PLAN	FY26 BUDGET PLAN
60	Relay Replacements - Underfrequency	G53	\$0	\$150,000	\$125,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
61	Relay Replacements - Line/Transformer	G53	\$0	\$250,000	\$432,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
62	Relay Replacements - Line/Transformer	G53	\$0	\$0	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
G53 - Communication Projects												
63	Cellular Phone Repeater	G53	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
64	Comm Site Building Replacem	G53	\$0	\$0	\$75,000	\$1,000,000	\$0	\$0	\$0	\$0	\$0	\$0
65	Comm Site Building Replacem	G53	\$0	\$0	\$0	\$0	\$75,000	\$1,000,000	\$0	\$0	\$0	\$0
66	DACs Replacements	G53	\$250,000	\$242,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
67	DACs Replacements	G53	\$0	\$200,000	\$250,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
68	Fiber Optic - Optical Mux Replacements	G53	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
69	Fiber Optic - Cisco SONET Replacement	G53	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
70	Fiber Optic - Installation (Full Path, 8 Miles)	G53	\$100,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
71	Fiber Optic - Installation (In Study Phase)	G53	\$0	\$0	\$0	\$0	\$0	\$0	\$880,000	\$880,000	\$880,000	\$880,000
72	Power System Replacement (Comm Ctr)	G53	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
73	Power System Replacement (Microwave Bldg)	G53	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
74	Power System Replacement (Microwave Bldg Batteries)	G53	\$0	\$35,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
75	Power System Replacement (Comm Center Batteries)	G53	\$0	\$0	\$35,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
76	Power System Replacement	G53	\$0	\$0	\$0	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000
77	Radio Replacements	G53	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
78	Radio Replacements	G53	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
79	Radio Replacements (JUS)	G53	\$0	\$0	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000
80	CAISYS Equipment Replacement / Voice Recorder	G53	\$0	\$0	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000
81	Optical Mux Replacements (FOP)	G53	\$50,000	\$50,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
82	RTU Replacements	G53	\$0	\$0	\$85,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
83	RTU Replacements	G53	\$0	\$0	\$0	\$85,000	\$0	\$0	\$0	\$0	\$0	\$0
84	RTU Replacements	G53	\$0	\$0	\$0	\$85,000	\$85,000	\$85,000	\$85,000	\$85,000	\$85,000	\$85,000
85	RTU Replacements	G53	\$139,000	\$150,000	\$150,000	\$150,000	\$150,000	\$0	\$0	\$0	\$0	\$0
86	WIN/CIP	G53	\$200,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
G6300 TOTALS			\$1,243,000	\$1,677,000	\$1,992,000	\$2,195,000	\$1,185,000	\$1,960,000	\$1,840,000	\$1,840,000	\$1,840,000	\$1,840,000
87	Install Double Circuit Inset Structure Lines 1 & 2	G56	\$459,859	\$54,064	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
88	Saquare Bypass	G56	\$10,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
89	Lone Butte Structure	G56	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
90	SGRTUC Structure 30-5 Steel Pole Replacement	G56	\$500,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
91	Physical Security Upgrade	G56	\$500,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
G6600 TOALS			\$1,468,859	\$54,064	\$0							
PARKER DAVIS TOTALS			\$7,522,000	\$7,276,064	\$7,278,238	\$7,546,497	\$6,323,791	\$7,109,731	\$6,951,217	\$7,082,754	\$7,191,476	\$7,191,476
GRAND TOTALS			\$33,392,950	\$27,494,128	\$17,807,238	\$13,771,497	\$11,448,791	\$10,824,731	\$10,286,217	\$10,417,754	\$10,526,476	\$10,526,476
TABLE OF DISTRIBUTION BY ORG												
	ORG	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	
	A27	\$350,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	
	G1	\$700,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	
	A26	\$180,000	\$249,000	\$691,238	\$481,497	\$218,791	\$229,731	\$241,217	\$422,754	\$531,476	\$531,476	
	G52	\$4,480,141	\$5,006,000	\$4,095,000	\$4,370,000	\$4,420,000	\$4,420,000	\$4,370,000	\$4,320,000	\$4,320,000	\$4,320,000	
	G53	\$2,925,000	\$3,212,000	\$3,932,000	\$4,700,000	\$2,970,000	\$3,095,000	\$2,975,000	\$2,975,000	\$2,975,000	\$2,975,000	
	G56	\$23,357,809	\$16,727,128	\$8,589,000	\$1,520,000	\$1,140,000	\$380,000	\$0	\$0	\$0	\$0	
	G8	\$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	\$1,500,000	
	RC-TBD	\$0	\$0	\$200,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	
		\$33,392,950	\$27,494,128	\$17,807,238	\$13,771,497	\$11,448,791	\$10,824,731	\$10,286,217	\$10,417,754	\$10,526,476	\$10,526,476	





9.3 AOA Evaluation Methodology

The Evaluation Factors that will be addressed in this section for each alternative are:

- Are the Mission needs and the functional requirements defined?
- Do the Proposed Alternatives meet the Mission need?
- Describe the plan for identifying, analyzing, and selecting alternatives.
- Document and justify all assumptions and constraints used in the analysis.
- Conduct the Pre-conceptual analysis without a predetermined solution.
- Review alternatives before proceeding, eliminates those that are not viable, and documents the reasons for eliminating any alternatives.
- Quantify the benefits/effectiveness resulting from each alternative over that alternatives full life cycle, if possible.
- Add the MDCC definition sheet and explain the MDCC score is not the scoring for each alternative but is used to score the Project need.

A benefits / effectiveness worksheet will be used to provide a quantitative review of the alternatives.

This work sheet is based on the MDCC work sheet and provides a way to rank the Alternatives according to three weighted sections. Scoring is based on improvements to the existing site.

9.4 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.





EXAMPLE PROJECT NAME

Alternative No. 1 – Description

Ranking Below, Yellow Highlighted Area is Based on Improvements for Each Alternative

- < 1 = Degrading Conditions
- 1 = No Improvement
- 2 = Minor Improvement
- 3 = Average Improvement
- 4 = Above Average Improvement
- 5 = Great Improvement

Degrading Conditions	Alternative Results				Major Improvement
	1	2	3	4	
< 1	1	2	3	4	5

Total Weighted Score 1.271

Compliance	0.88
Section Weight	0.40
Weighted Score	0.35

Compliance	
1.0	Meets Environmental regulatory requirements
1.0	Meets NERC regulatory requirements
1.0	Equipment/Facility will Constrain the Power System
0.5	Meets Health and Safety requirements

Comments

40% weight is appropriated to categories involving impacts on Western's ability to meet or comply with Environmental, NERC/NESC, Risk, and safety requirements associated with not meeting the aforementioned criteria. And will the equipment or facility currently or in the near future constrain the transmission system.

Reliability	1.92
Section Weight	0.35
Weighted Score	0.67

Reliability	
3.0	Equipment or Facility Condition
2.0	Availability of Replacement Parts
4.0	Impact on BET system if option implemented
1.0	Number of outages that have occurred and the frequency of outages
1.0	Facility loading and encroachment on maximum ratings
0.5	Risk score(s) and Health Index from Maximo asset manager

Comments

35% weight is appropriated to categories involving impacts to Western's overall system reliability including facility/equipment conditions, ease of repair and part replacement, a no action impact, outage frequency, loading on maximum equipment ratings, potential load growth and risk associated with not meeting the aforementioned criteria.

Economical	1.00
Section Weight	0.25
Weighted Score	0.25

Economical	
1.0	Social and economic impacts of completing the project
1.0	Contractual Power Marketing agreements
1.0	Obligation for a path that meets a contractual requirement
1.0	Loss of revenue or possible Load Growth
1.0	Customer(s) incur increased maintenance costs

Comments

25% weight is appropriated to categories involving economic impacts to Western or its customers including socioeconomic impacts, Western revenue loss, Customer incurred costs, customer impact, life-cycle costs and risk associated with not meeting the aforementioned criteria.

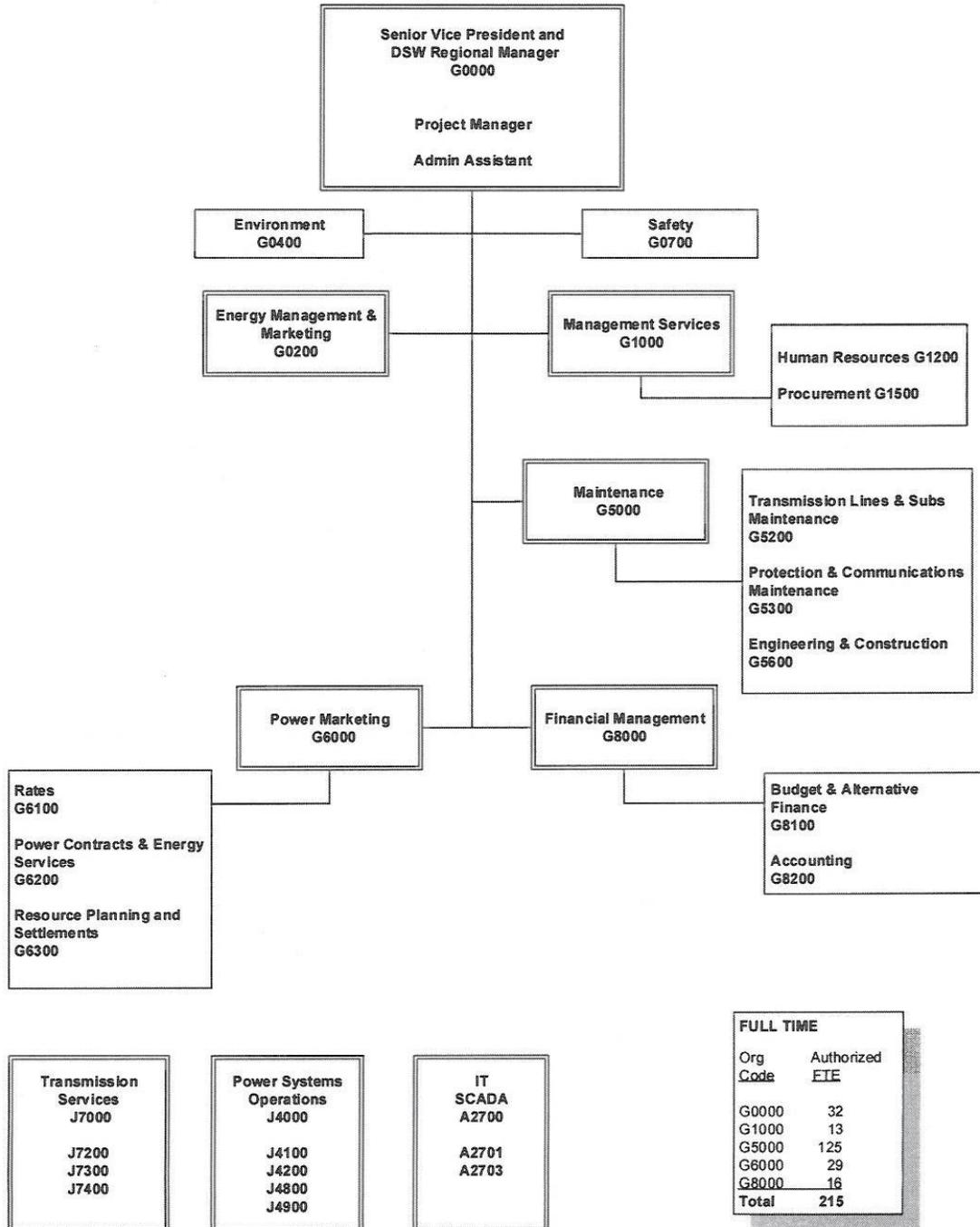




9.5 DSW Organizational Charts

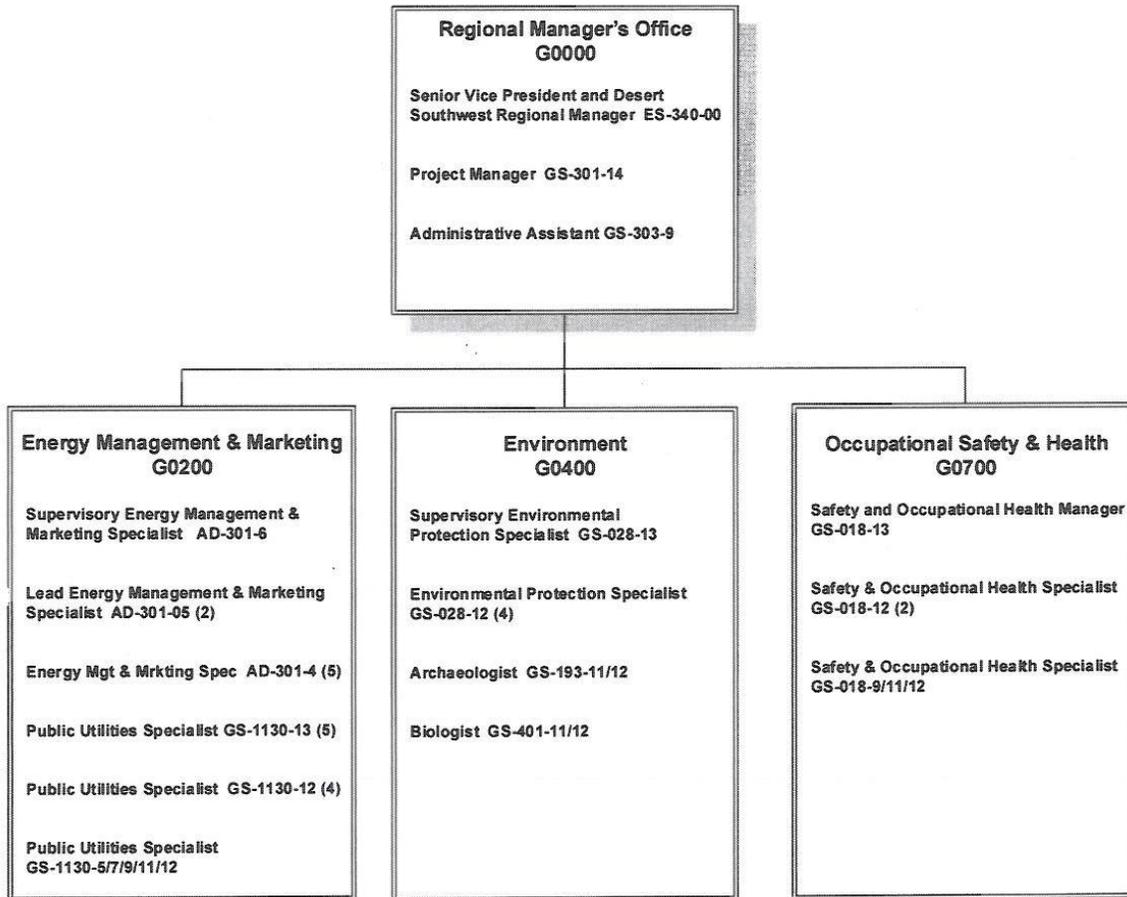
DESERT SOUTHWEST REGION FY 2018

OVERVIEW





**DESERT SOUTHWEST REGION
FY 2018**

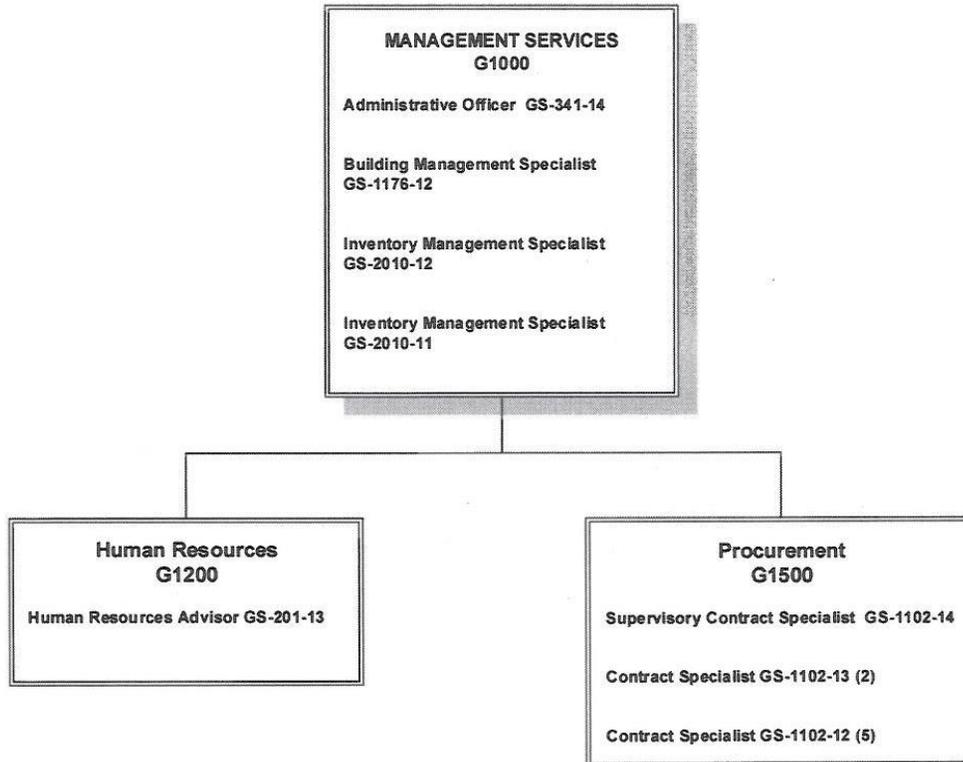


	Authorized FTE
Total	32
G0000	3
G0200	18
G0400	7
G0700	4





DESERT SOUTHWEST REGION
FY 2018

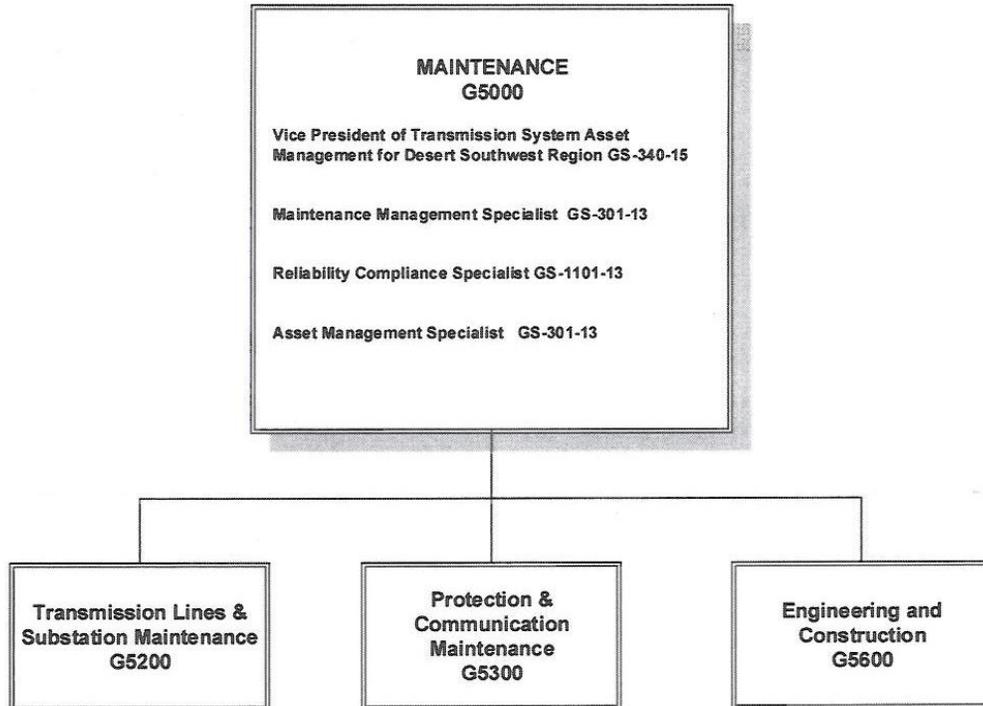


	Authorized FTE
Total	13
G1000	4
G1200	1
G1500	8





DESERT SOUTHWEST REGION
FY 2018

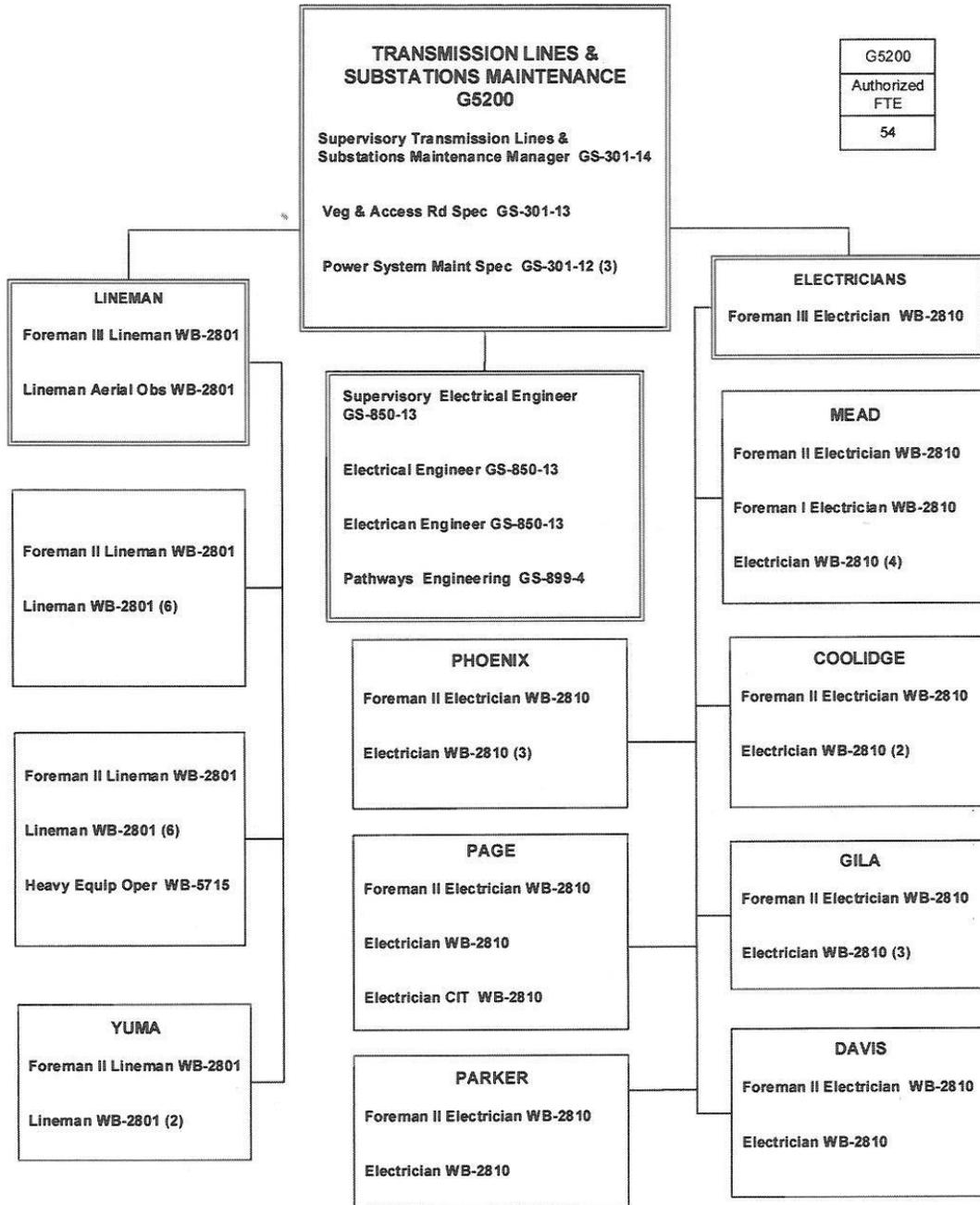


	Authorized FTE
Total	125
G5000	4
G5200	54
G5300	41
G5600	26



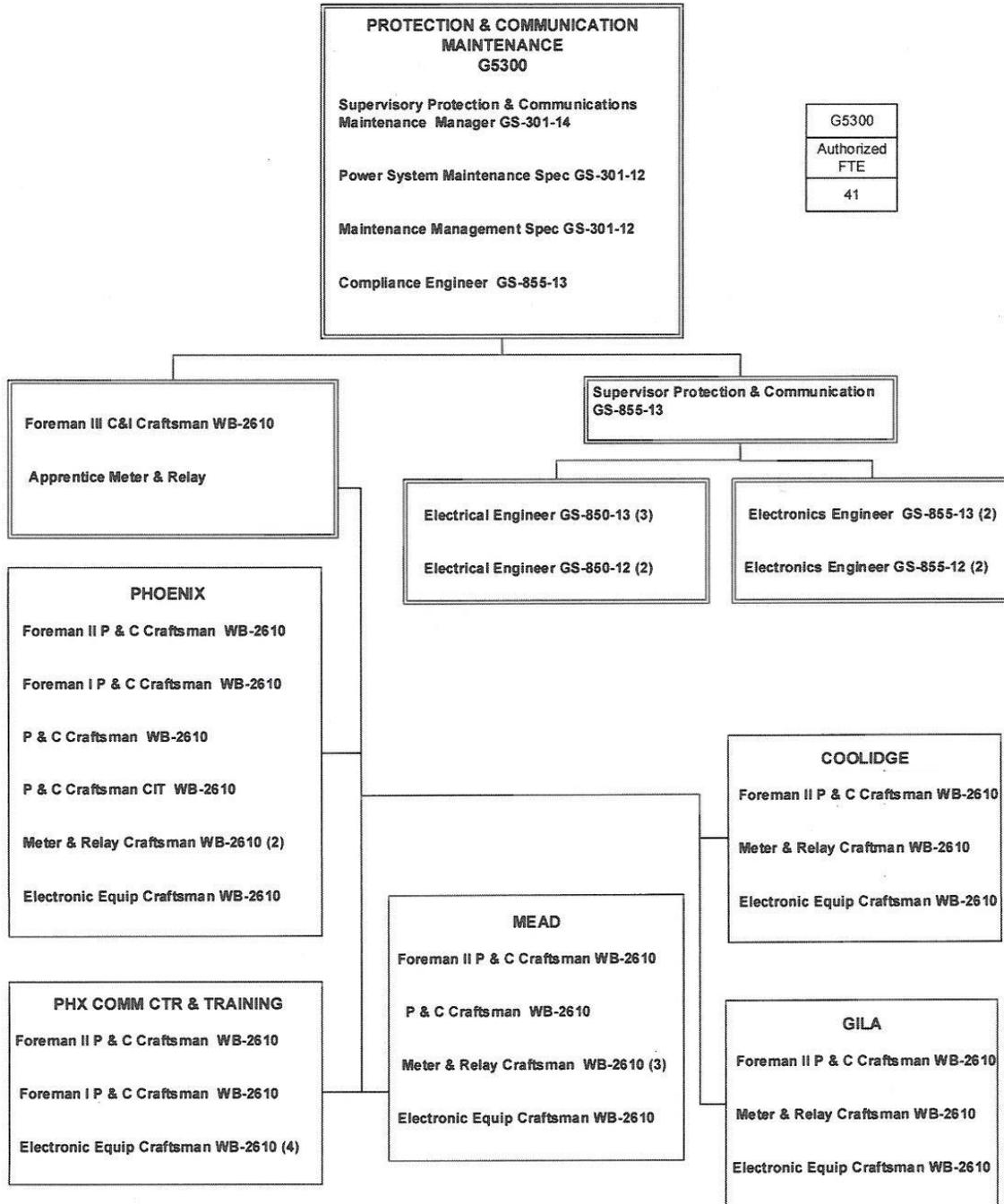


**DESERT SOUTHWEST REGION
FY 2018**





**DESERT SOUTHWEST REGION
FY 2018**

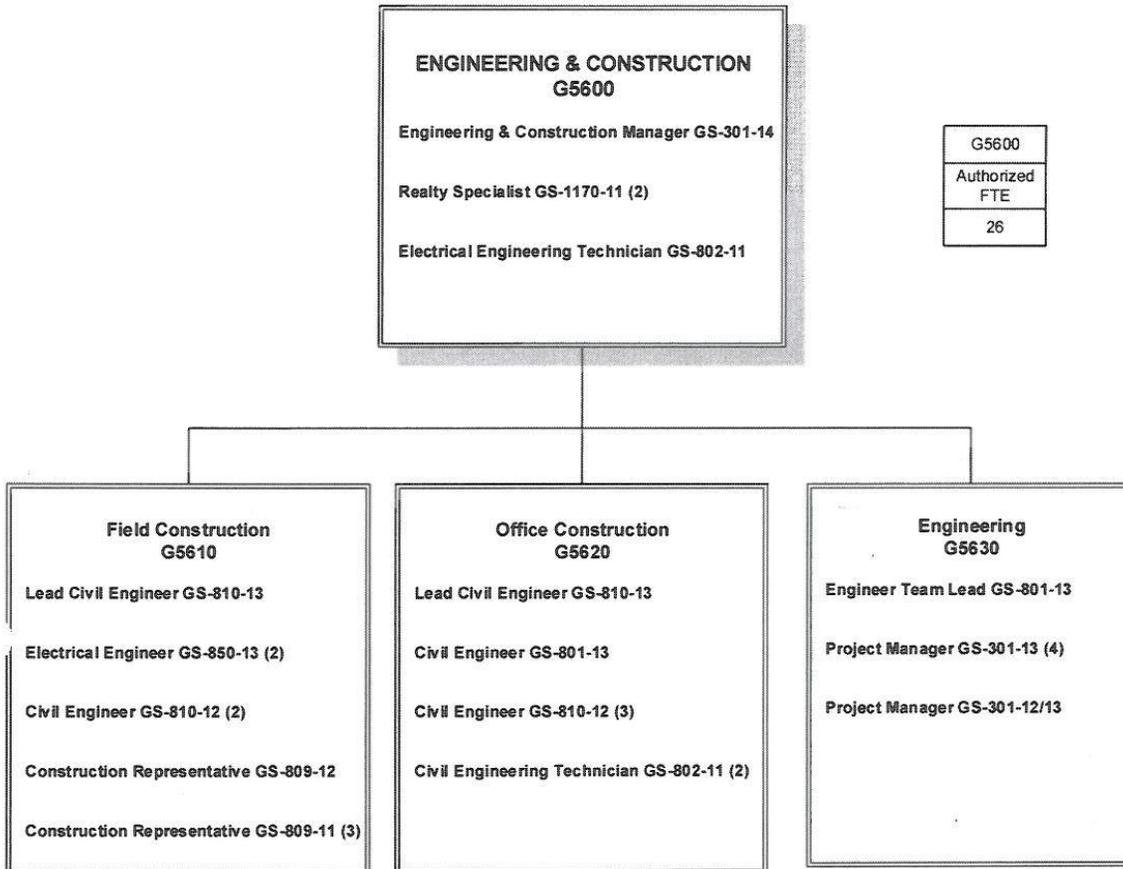


G5300
Authorized FTE
41



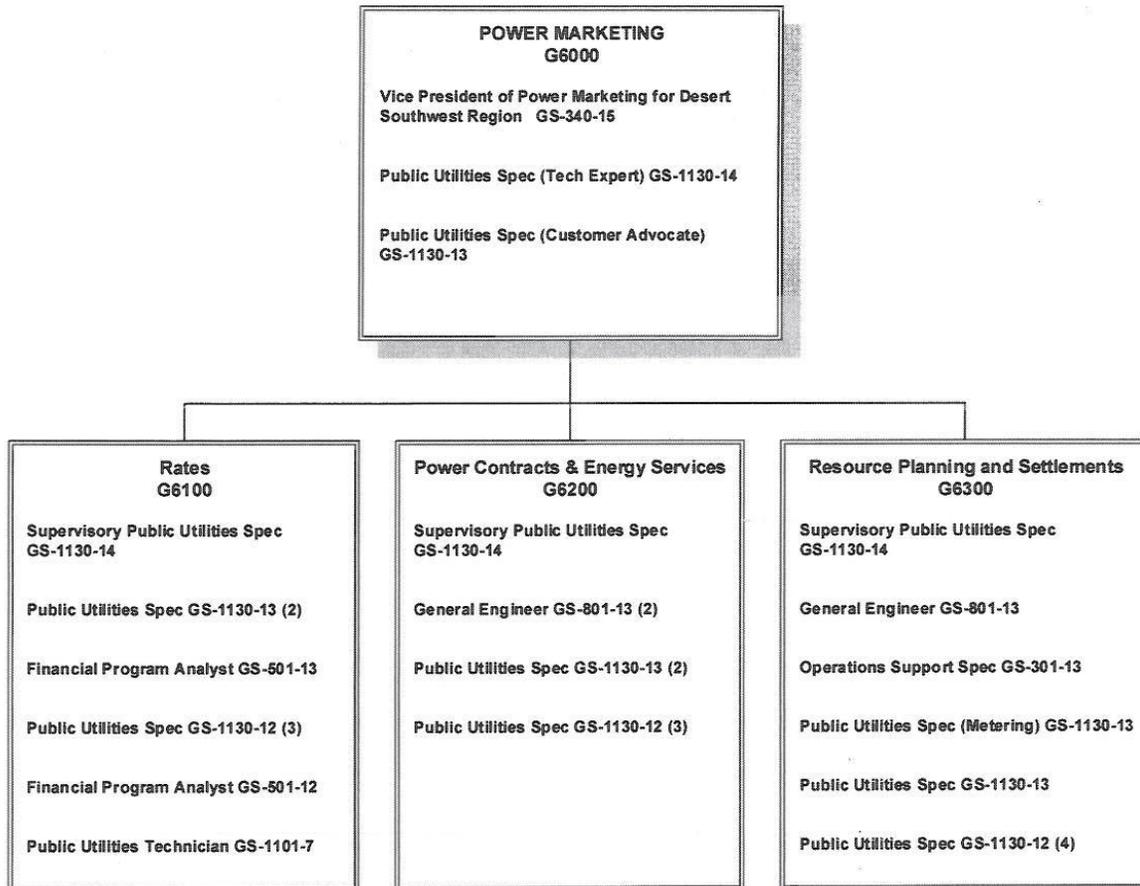


**DESERT SOUTHWEST REGION
FY 2018**





**DESERT SOUTHWEST REGION
FY 2018**

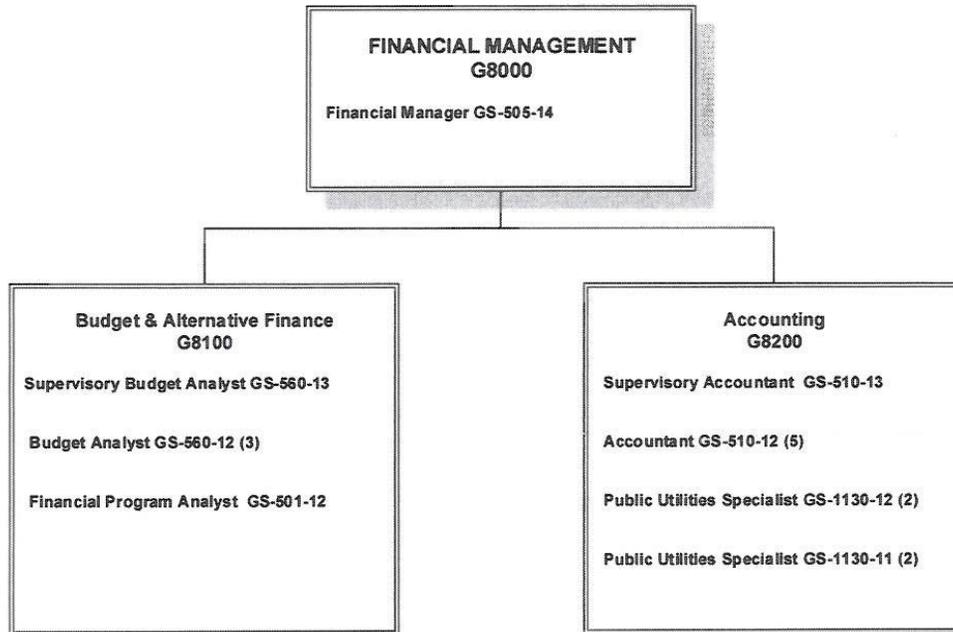


	Authorized FTE
Total	29
G6000	3
G6100	9
G6200	8
G6300	9





DESERT SOUTHWEST REGION
FY 2018



	Authorized FTE
Total	16
G8000	1
G8100	5
G8200	10

