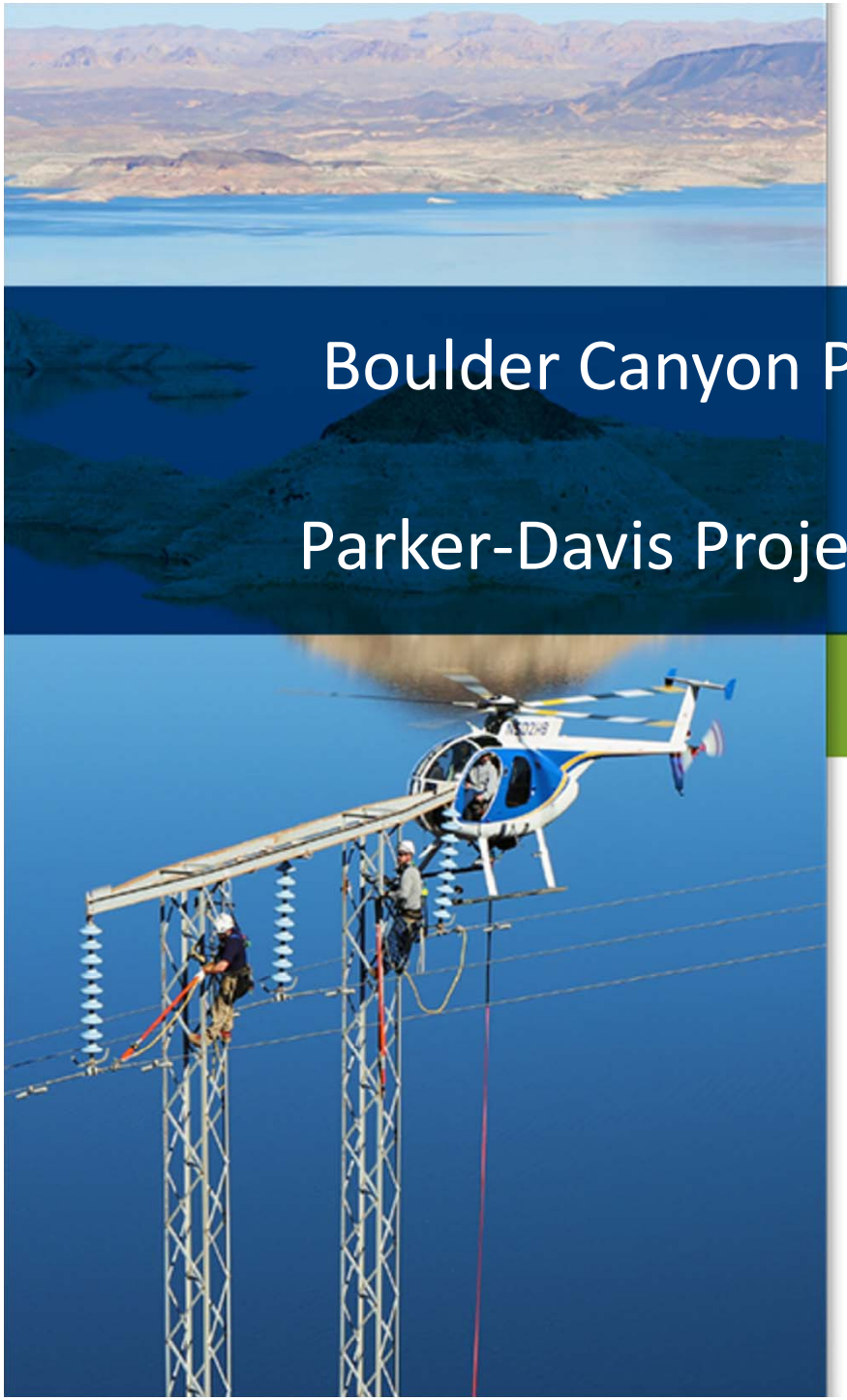


Western Area Power Administration

Boulder Canyon Project Master Schedule And Parker-Davis Project Annual Operating Plan

May 28, 2020

Annual Meeting

Webex

AGENDA

Hydrology Update

BCP Master Schedule

Resource Integration Exchange

Hoover Portal

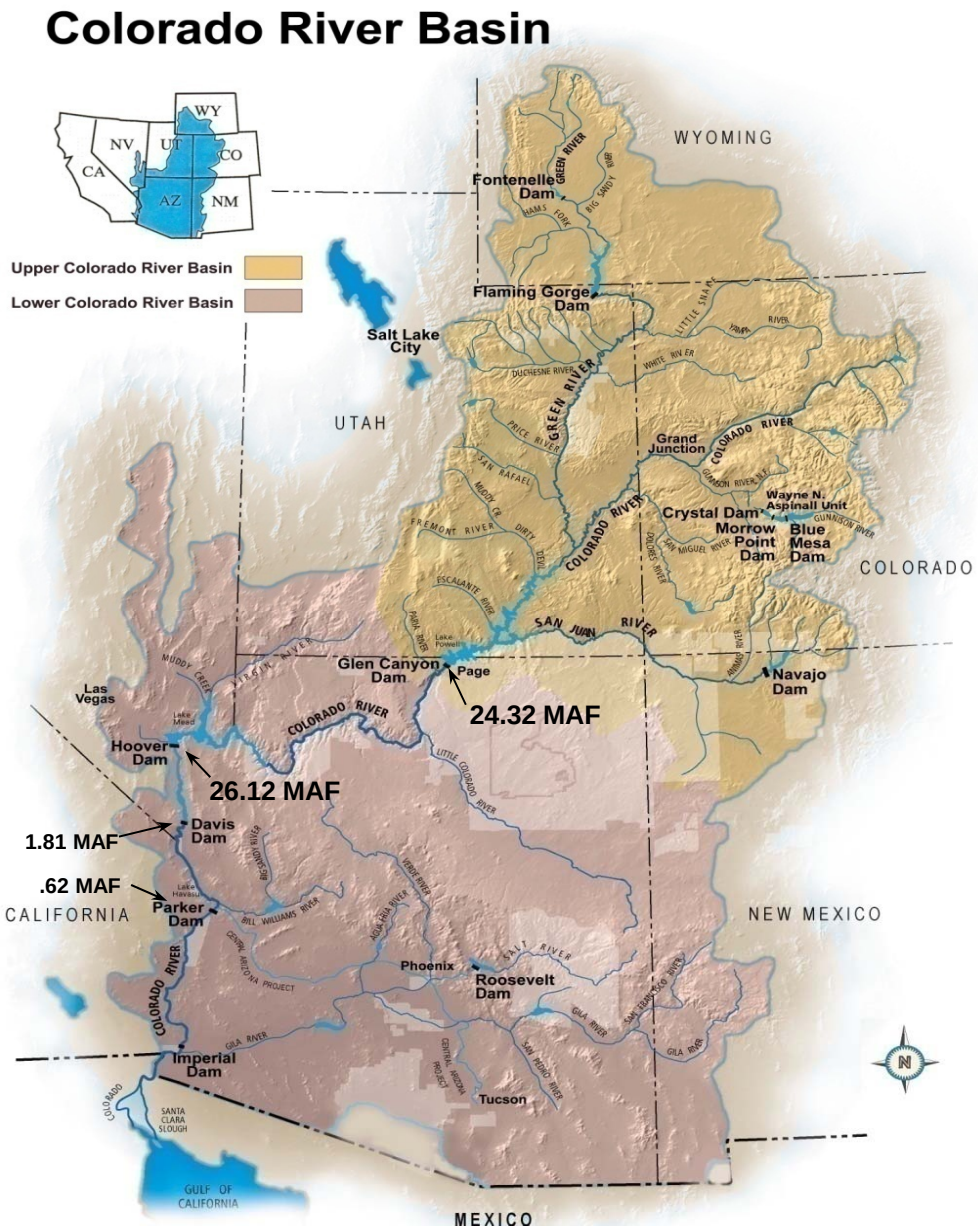
Project Integration

P-DP Annual Operating Plan

Markets and Remarketing

Colorado River Basin Hydrology

- 16.5 million acre-feet (maf) max allocated annually
- 13 to 14.5 maf of consumptive use annually
- 60 maf of storage
- 14.8 maf average annual "natural" inflow into Lake Powell over past 110 years
- Inflows are highly variable year-to-year



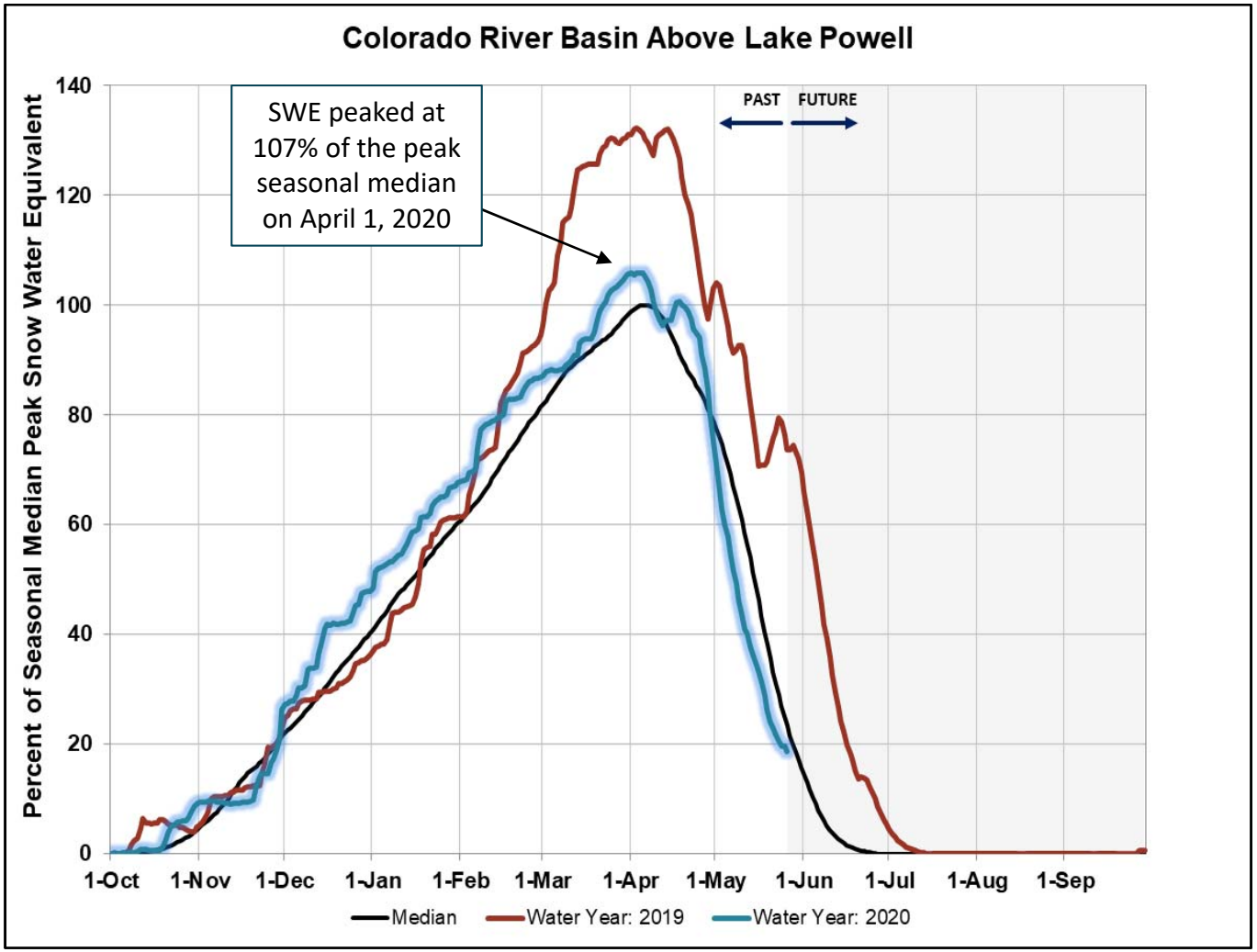
Water Year Snowpack and Precipitation as of May 26, 2020

Colorado River Basin above Lake Powell

Water Year 2020

Precipitation (year-to-date) 82% of average

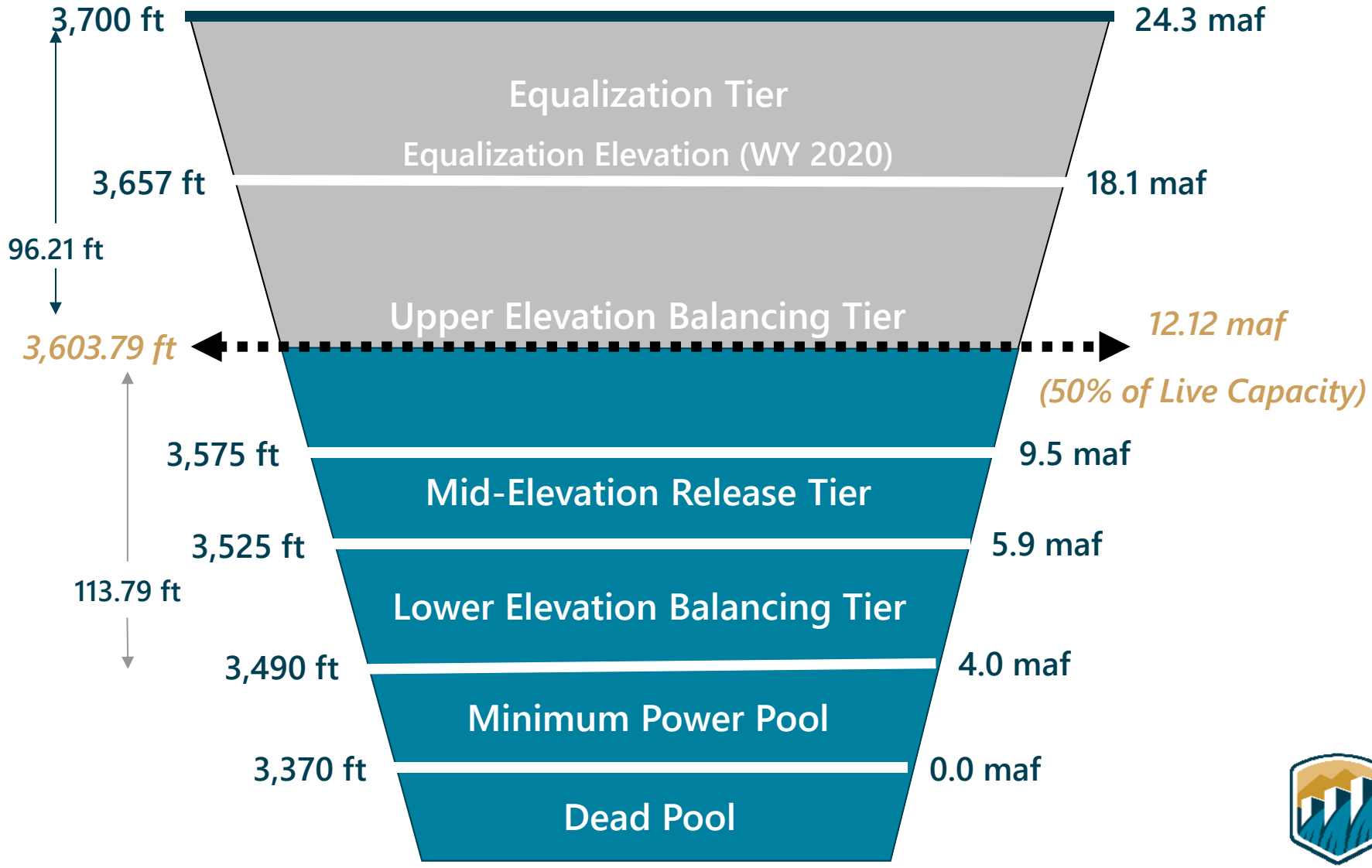
Current Snowpack 73% of median



Hydrology Update
Actual WY 2019 Results &
WY 2020 Current Forecast

Lake Powell	WY 2019		WY 2020	
	(maf)	%	(maf)	%
Unreg Inflow (Norm=12.1)	12.9	107%	7.4	61%
Apr-Jul Unreg Inflow (Norm=7.2)	10.4	145%	4.7	65%
Storage (Max=24.3)	13.3	55%	12.4	51%
Releases to Lake Mead (Norm=8.23)	9.0	109%	8.23	100%
	(ft.)		(ft.)	
Max Lake Elev.	3622 (Jul)		3615 (Jun)	
Min Lake Elev.	3569 (Mar)		3599 (Apr)	
End WY Lake Elev.	3615		3607	

Lake Powell Capacity



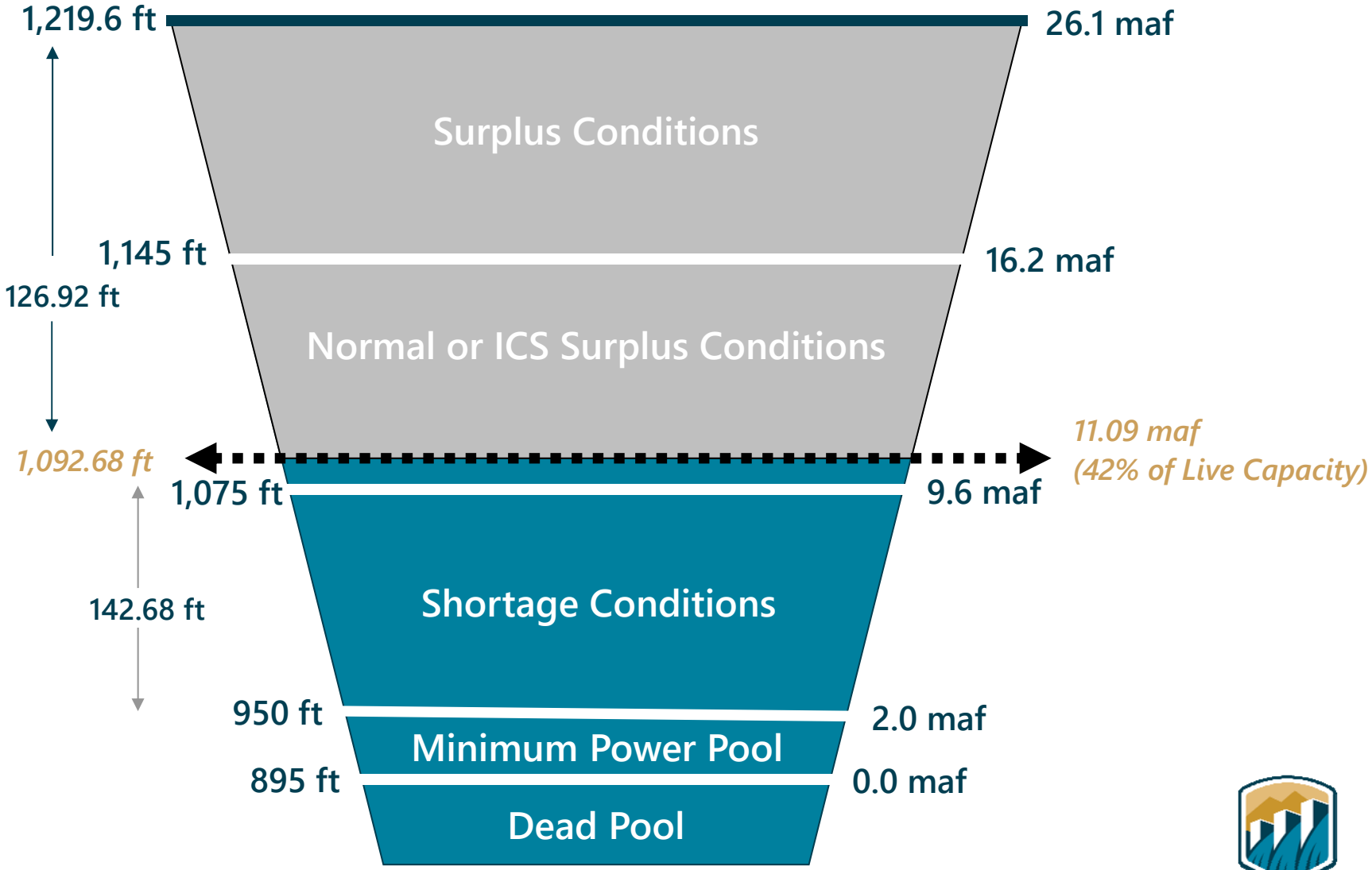
Not to scale

As of May 26, 2020

Hydrology Update
Actual WY 2019 Results &
WY 2020 Current Forecast

Lake Mead	WY 2019		WY 2020	
	(maf)	%	(maf)	%
Side Inflow (Norm=1.3)	1.1	85%	.96	73%
Storage (Max=26.1)	10.3	39%	10.4	40%
Downstream Releases	8.9	--	8.3	--
	(ft.)		(ft.)	
Max Lake Elev.	1090 (Mar)		1099 (Mar)	
Min Lake Elev.	1078 (Nov)		1083 (Oct)	
End WY Lake Elev.	1083		1084	

Lake Mead Capacity



Not to scale

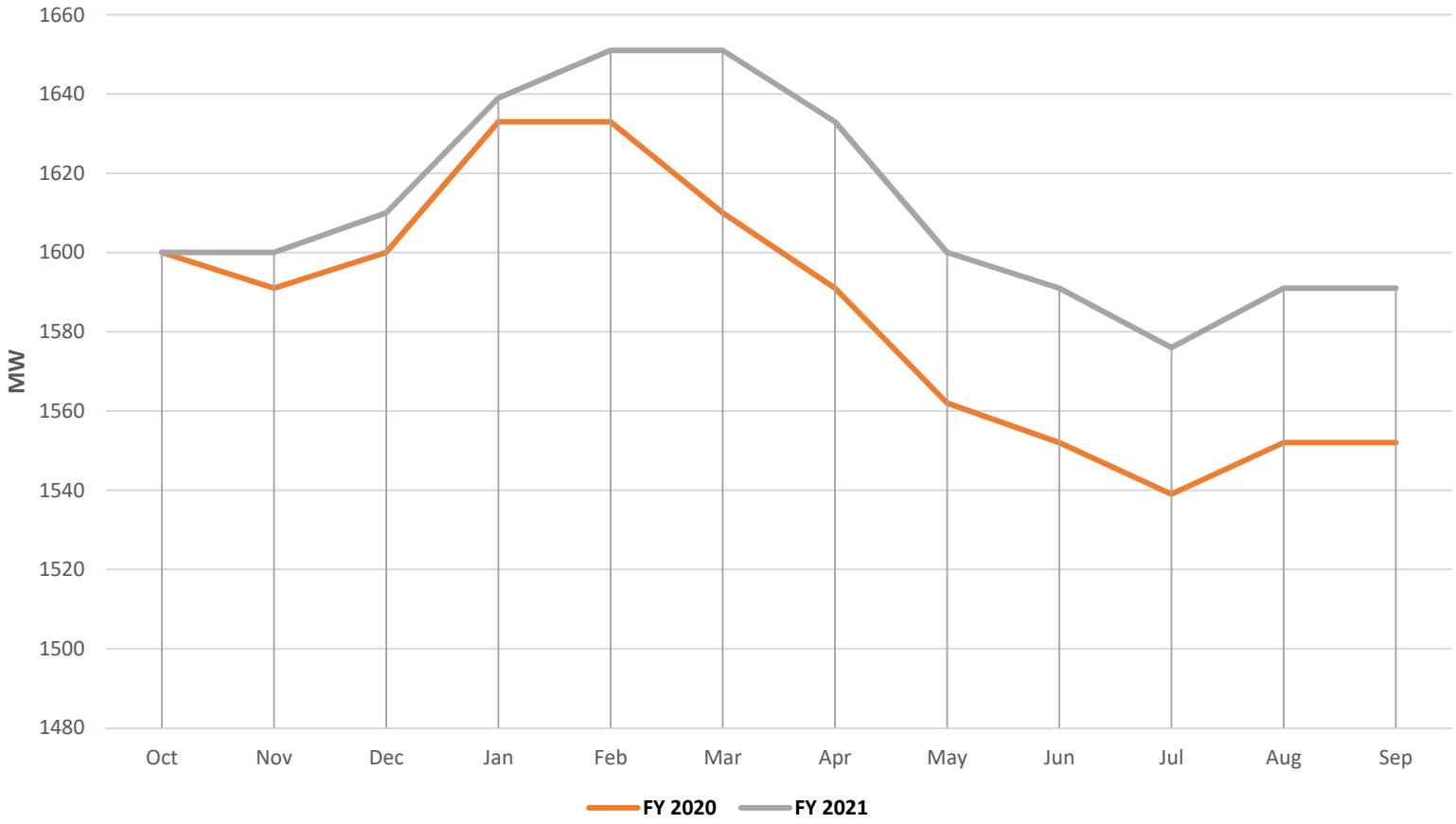
As of May 26, 2020

WY 2021 Hydrology Forecast
(Based on May 2020 24-month Study)

	Powell	%	**Mead**	%
Operating Criteria	Upper Elev Balancing Tier		Norm/Intent Created Surplus	
1/1/21 Elev (ft)	3601.0		1086.4	
Unreg Inflow (maf)	10.7	88	.88	68
Apr-Jul Unreg Inflow (maf)	7.2	100	--	--
Releases (maf)	9.0	109	9.3	--
End WY Storage (maf)	13.4	55	10.2	39
Max Elev (ft)	3622 (Jul.)		1094 (Feb.)	
Min Elev (ft)	3592 (Mar.)		1082 (Jul.)	
End WY Elev (ft)	3616		1082	

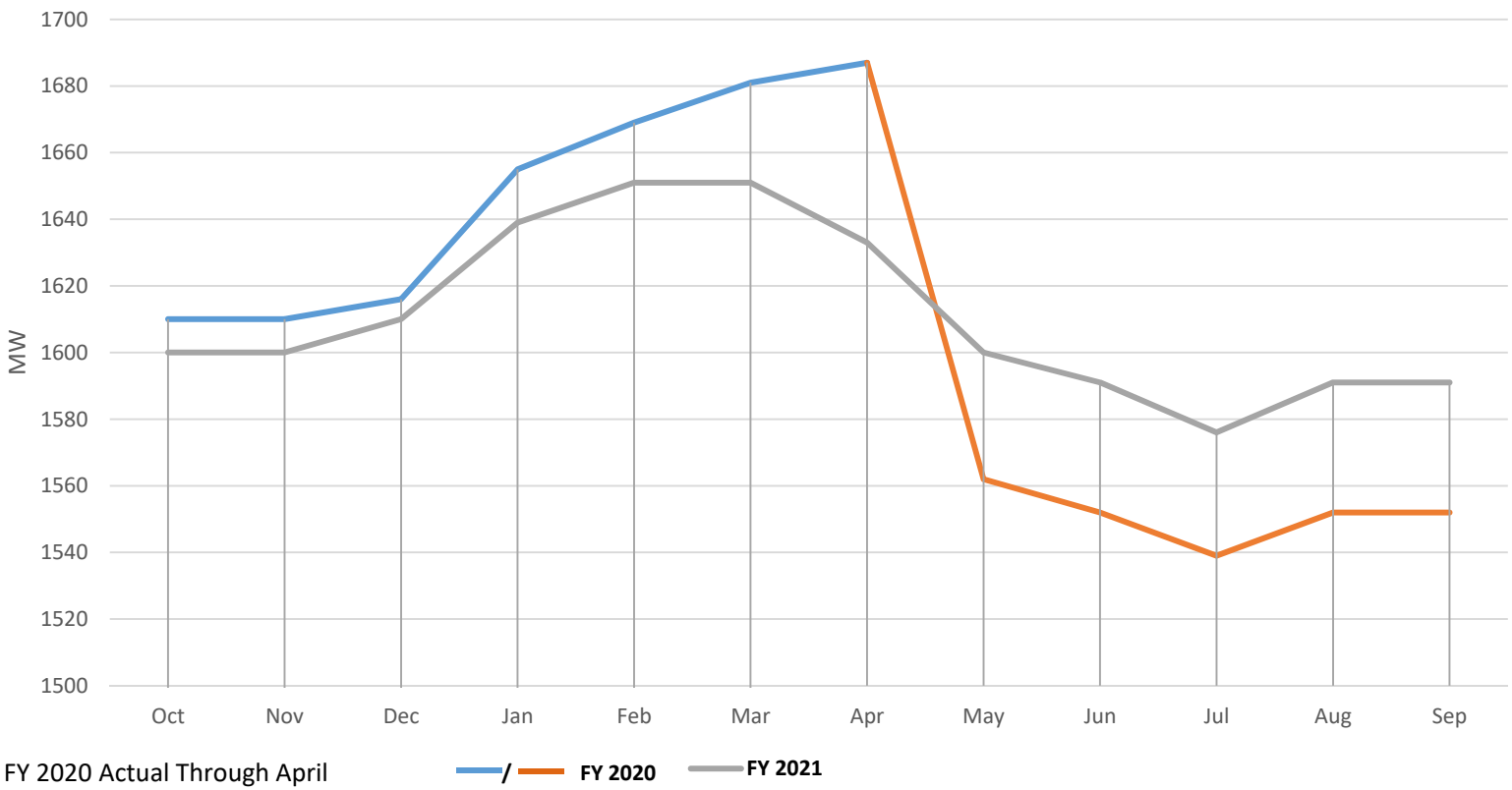
Boulder Canyon Project
Master Schedule

Forecast Capacity Comparison
(Based on June 17-Month Operating Study)



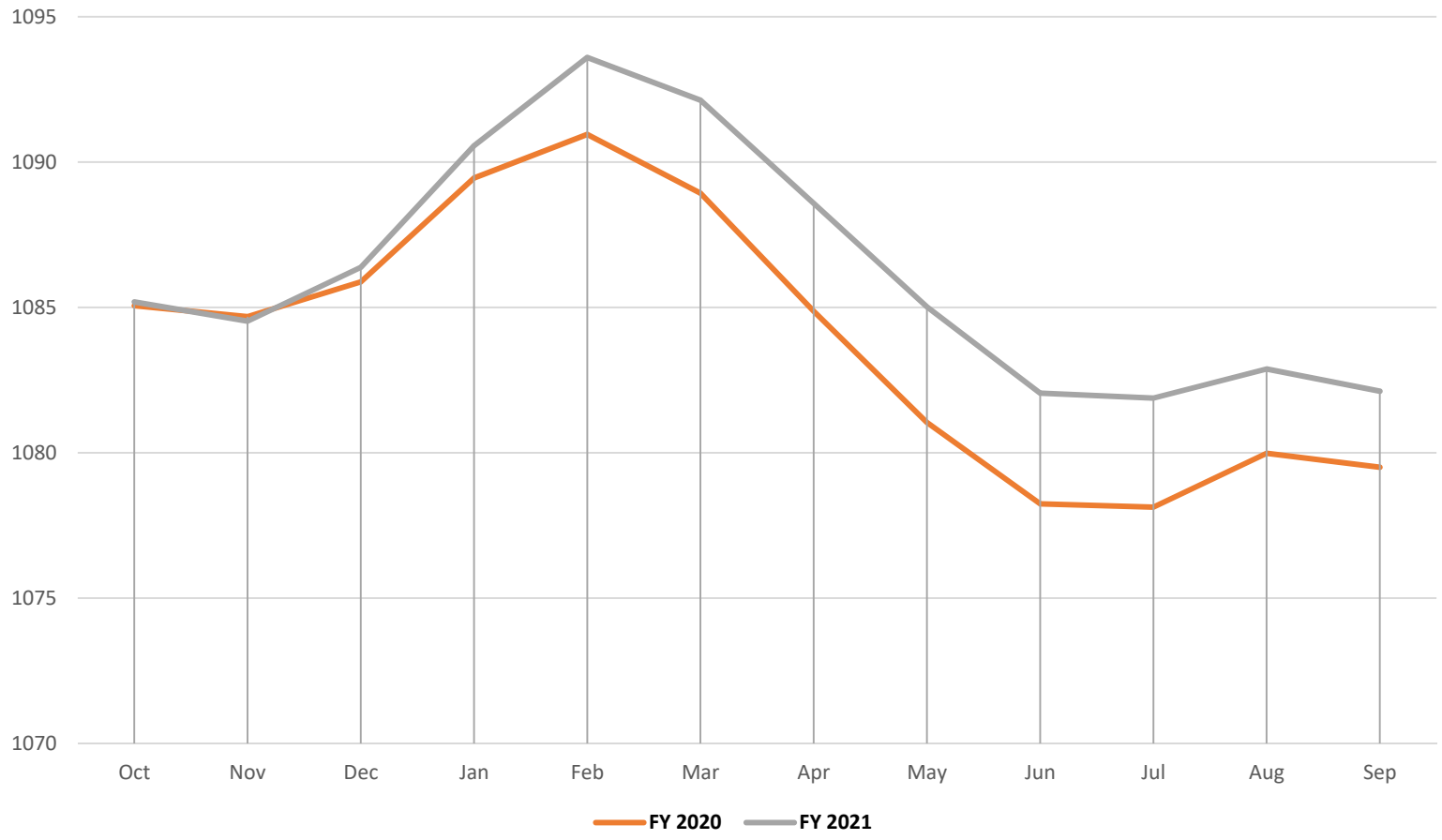
Boulder Canyon Project
Master Schedule

Actual and Forecast Capacity Comparison
(Forecast Based on June 17-Month Operating Study)
(Actual Based on BOR Capacity Letter)



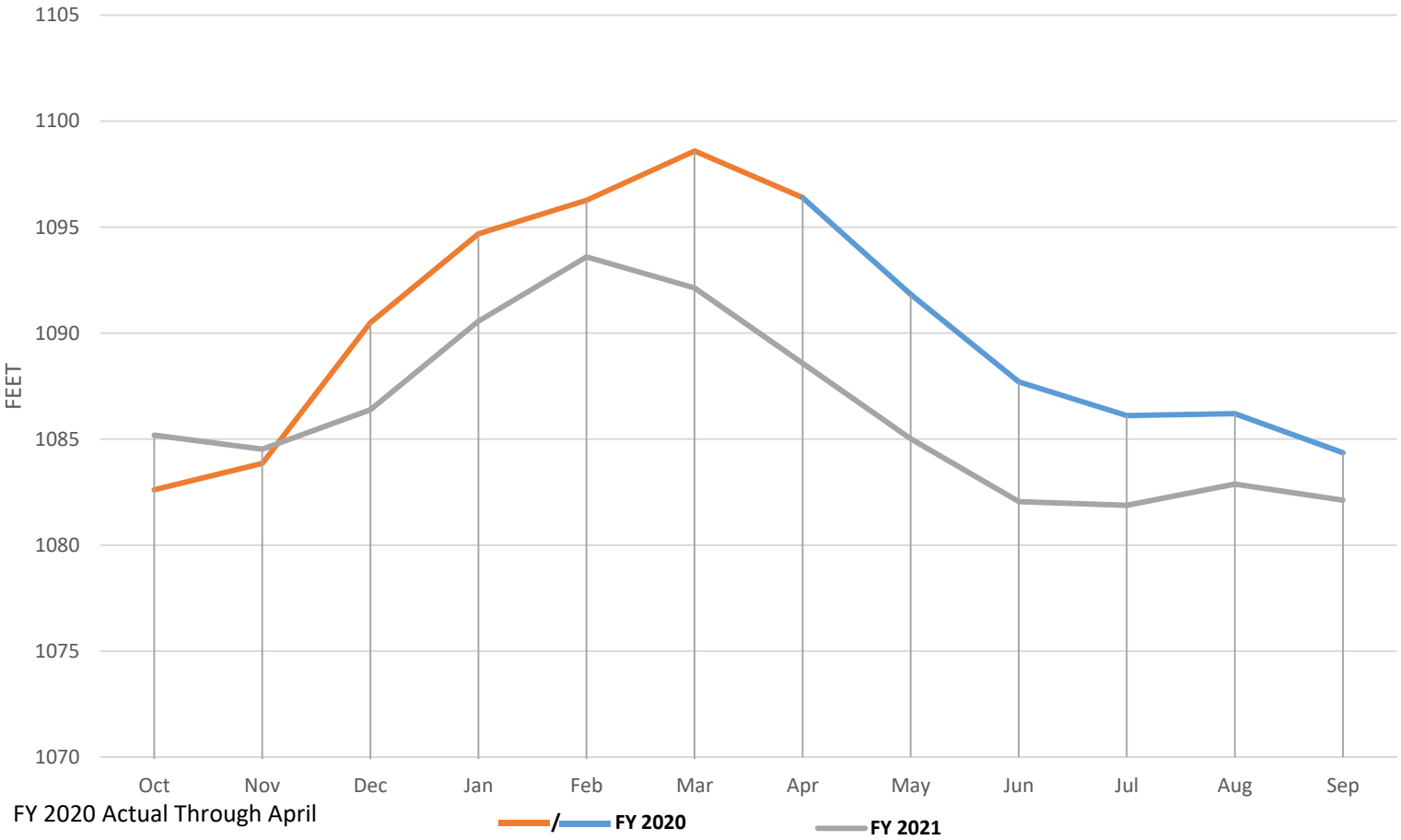
Boulder Canyon Project
Master Schedule

Lake Mead Elevation Forecast Comparison (Feet)
(Based on 24-Month Study)



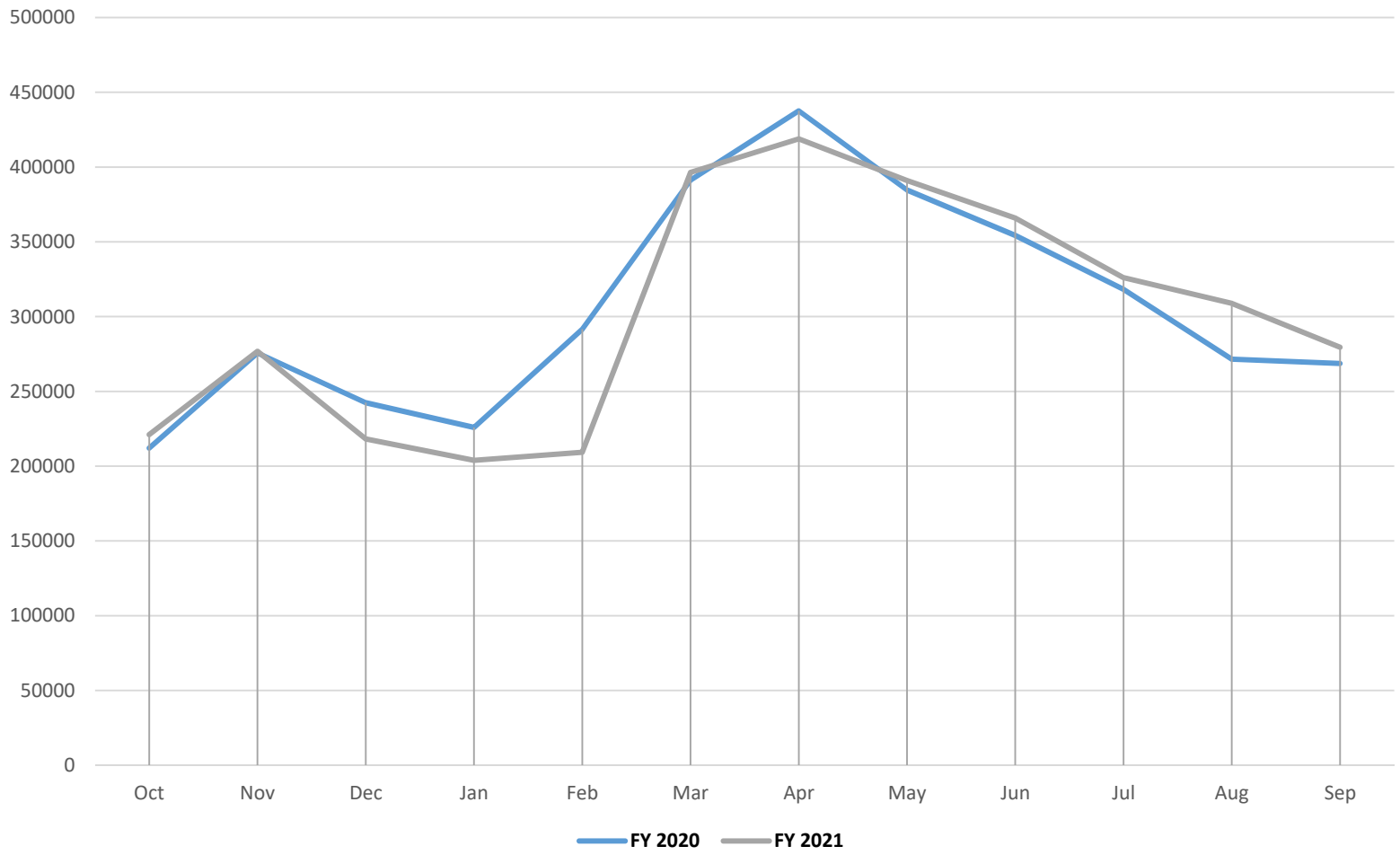
Boulder Canyon Project
Master Schedule

Actual & Forecast Lake Mead Elevation Comparison
(Based on 24-Month Study)



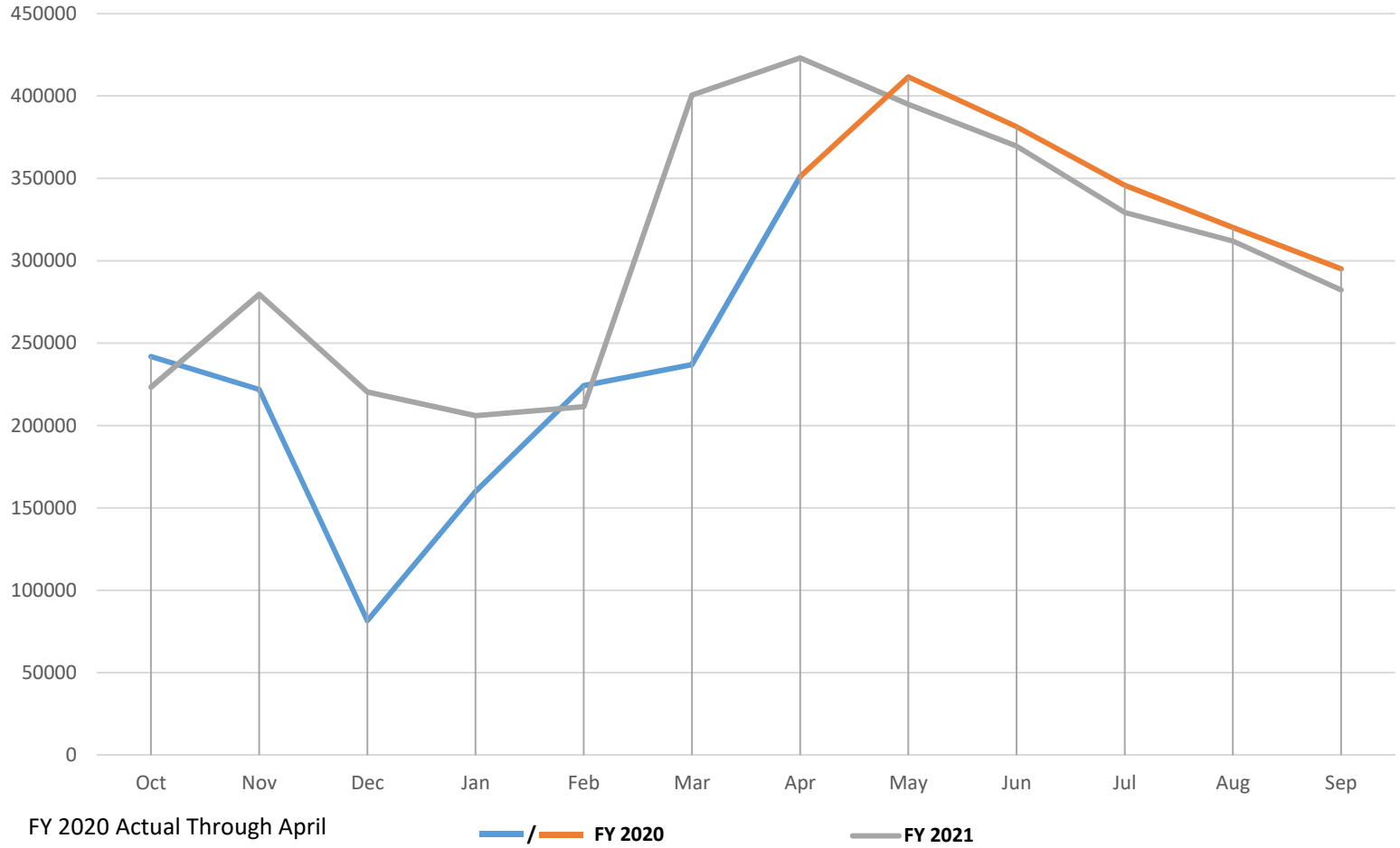
Boulder Canyon Project
Master Schedule

Final Master Schedule Energy Forecast Comparison (MWH)



Boulder Canyon Project
Master Schedule

Actual & Forecast 24-Month Study Energy Comparison (MWH)



Resource Integration Exchange Program

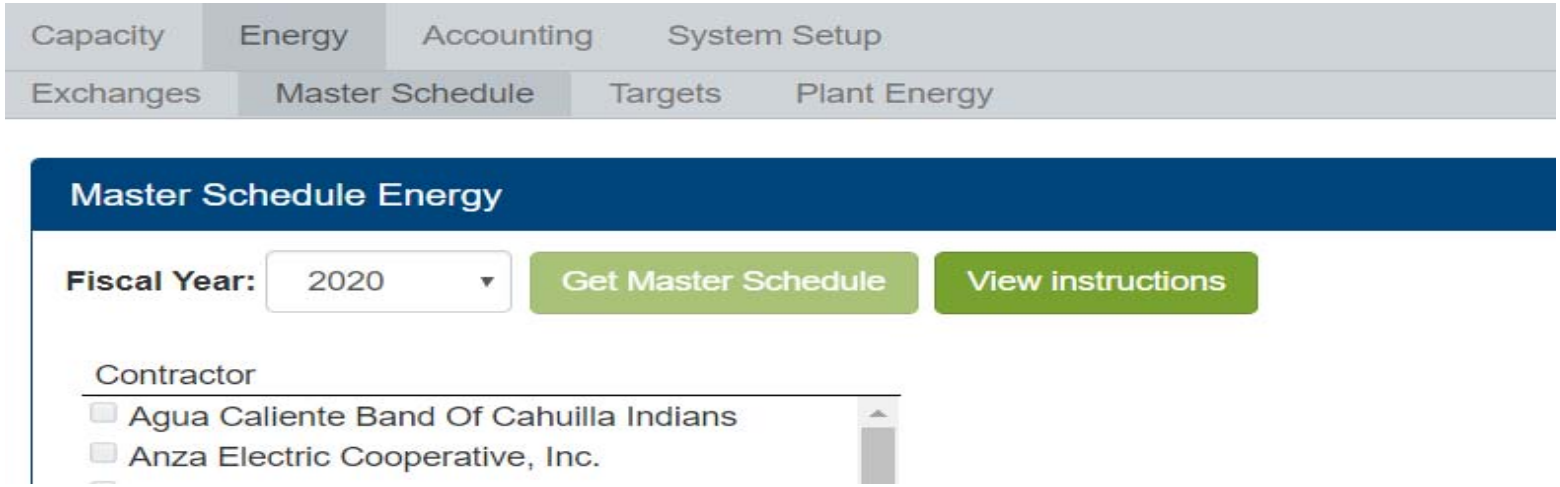
WAPA allows for the exchange of Parker-Davis Project (P-DP) and Boulder Canyon Project (BCP) energy between seasons. The program is conducted in two stages.

- Stage 1: Exchanges among P-DP and BCP contractors separately
  - Stage1 P-DP = 12,481 MWh
- Stage 2: Exchanges between P-DP and BCP contractors.

Resource Integration Exchange Program has a net zero impact on energy obligations for both projects

Hoover Portal
Master Schedule Notifications

- When draft or final Master Schedules are published on the portal, all portal users will be notified
- Portal data is updated at least monthly
  - Contact us for historical Master Schedule versions



Desert Southwest Region
Federal Resource Integration Guidelines

- Current integrated operations
  - BCP
  - P-DP
  - Western Area Lower Colorado (WALC)
- Desert Southwest Region (DSW) will integrate the projects to optimize resources and efficiently manage obligations
- DSW uses two deviation accounts to track individual project resources and obligations
  - BCP/P-DP
  - P-DP/WALC

DSW Federal Project Integration Plan

- BCP/P-DP
  - Opportunities for P-DP to provide energy to BCP will be identified and a forecast total for the year will be compiled (P-DP energy banked into BCP)
  - P-DP energy banked into BCP will be returned to P-DP in the months where P-DP resources are less then P-DP obligations
- P-DP/WALC
  - Buy or sale decisions will be made based on combined P-DP (including banking) and WALC resource and obligation position
    - Allocation of energy purchase costs and sales revenue will be based on which side was resource long or short
    - Allocation of reserve costs will based on needs and requirements of each side

FY 2019 AOP (presented 5/30/19)

Parker-Davis Project

	Prior Year Balance	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
		Actual GWh						Estimates GWh						
Resources														
Parker Generation		27.9	26.1	12.9	17	25.5	44.3	49.5	48.74	51.33	45.1	40.1	33.4	421.9
MWD's Parker Share		-13.8	-12.4	-6.835	-7.507	-12.29	-22.15	-24.75	-24.37	-25.67	-22.55	-20.05	-16.7	-209.1
Davis Generation		77.8	78.4	47.3	56.8	68.8	94.8	111.9	117.86	113.99	104.2	98.4	95.6	1065.9
Net Generation		**91.9**	**92.1**	**53.4**	**66.3**	**82.0**	**117.0**	**136.7**	**142.2**	**139.7**	**126.8**	**118.5**	**112.3**	**1278.7**
Other PDP Credits		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Purchases for PDP		13.0	3.7	17.4	13.9	14.4	18.0	4.6	13.0	7.2	15.6	18.8	18.9	158.4
Total Resources:		**104.9**	**95.8**	**70.8**	**80.2**	**96.4**	**134.9**	**141.3**	**155.2**	**146.9**	**142.3**	**137.2**	**131.2**	**1437.1**
Loads														
Total PDP Firm Load		82.9	79.1	80.5	80.0	73.9	147.3	145.6	149.3	146.3	151.5	150.1	144.3	1430.9
Energy Bank Sales		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Excess		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Surplus Sales		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PDP / BA Deviation	0.0	1.1	2.8	-11.0	3.1	10.0	-11.3	4.0	12.0	4.0	-1.8	-4.0	-4.1	4.9
Hoover Bank	-1.3	20.9	13.9	1.2	-2.9	12.5	-1.1	-8.3	-6.1	-3.4	-7.4	-8.9	-9.0	0.0
Total Loads:		**104.9**	**95.8**	**70.8**	**80.2**	**96.4**	**134.9**	**141.3**	**155.2**	**146.9**	**142.3**	**137.2**	**131.2**	**1437.1**

TOTAL FY 2019 PURCHASE POWER COSTS
$10,122,764

ENERGY COSTS
$9,226,071

RESERVES COSTS
$896,694

+ values represent energy from P-DP
- values represent energy to P-DP

FY 2019 AOP Final Results

Parker-Davis Project

	Prior Year Balance	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Resources														
Parker Generation		27.9	26.1	12.9	17	25.5	44.3	49.5	48.6	50.3	51.4	44.3	35.86	433.7
MWD's Parker Share		-13.8	-12.4	-6.835	-7.507	-12.29	-21.22	-24.61	-24.18	-25.02	-25.54	-21.96	-17.93	-213.3
Davis Generation		77.8	78.4	47.3	56.8	68.8	94.8	111.9	119.5	113.6	113.2	101.8	95.67	1079.6
Net Generation		**91.9**	**92.1**	**53.4**	**66.3**	**82.0**	**117.9**	**136.8**	**143.9**	**138.9**	**139.1**	**124.1**	**113.6**	**1299.9**
Other PDP Credits		0.2	-0.3	-0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	1.3
Purchases for PDP		12.0	3.4	16.0	12.8	13.2	16.6	4.3	3.7	7.1	11.6	18.6	22.7	142.1
Total Resources:		**104.1**	**95.2**	**69.3**	**79.2**	**95.4**	**134.6**	**141.1**	**147.8**	**146.2**	**150.9**	**143.0**	**136.5**	**1443.3**
Loads														
Total PDP Firm Load		82.9	79.1	80.5	80.0	73.9	147.3	145.8	149.9	146.9	152.1	150.7	144.6	1433.7
Energy Bank Sales		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Excess		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Surplus Sales		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PDP / BA Deviation	0.8	0.3	2.2	-12.4	2.2	9.0	-11.6	3.7	19.3	-3.5	2.7	-0.9	-11.2	0.9
Hoover Bank	-2.1	20.8	13.8	1.2	-3.0	12.4	-1.2	-8.3	-21.4	2.8	-4.0	-6.8	3.1	7.5
Total Loads:		**104.1**	**95.2**	**69.3**	**79.2**	**95.4**	**134.6**	**141.1**	**147.8**	**146.2**	**150.9**	**143.0**	**136.5**	**1443.3**

TOTAL FY 2019 PURCHASE POWER COSTS
$7,615,466

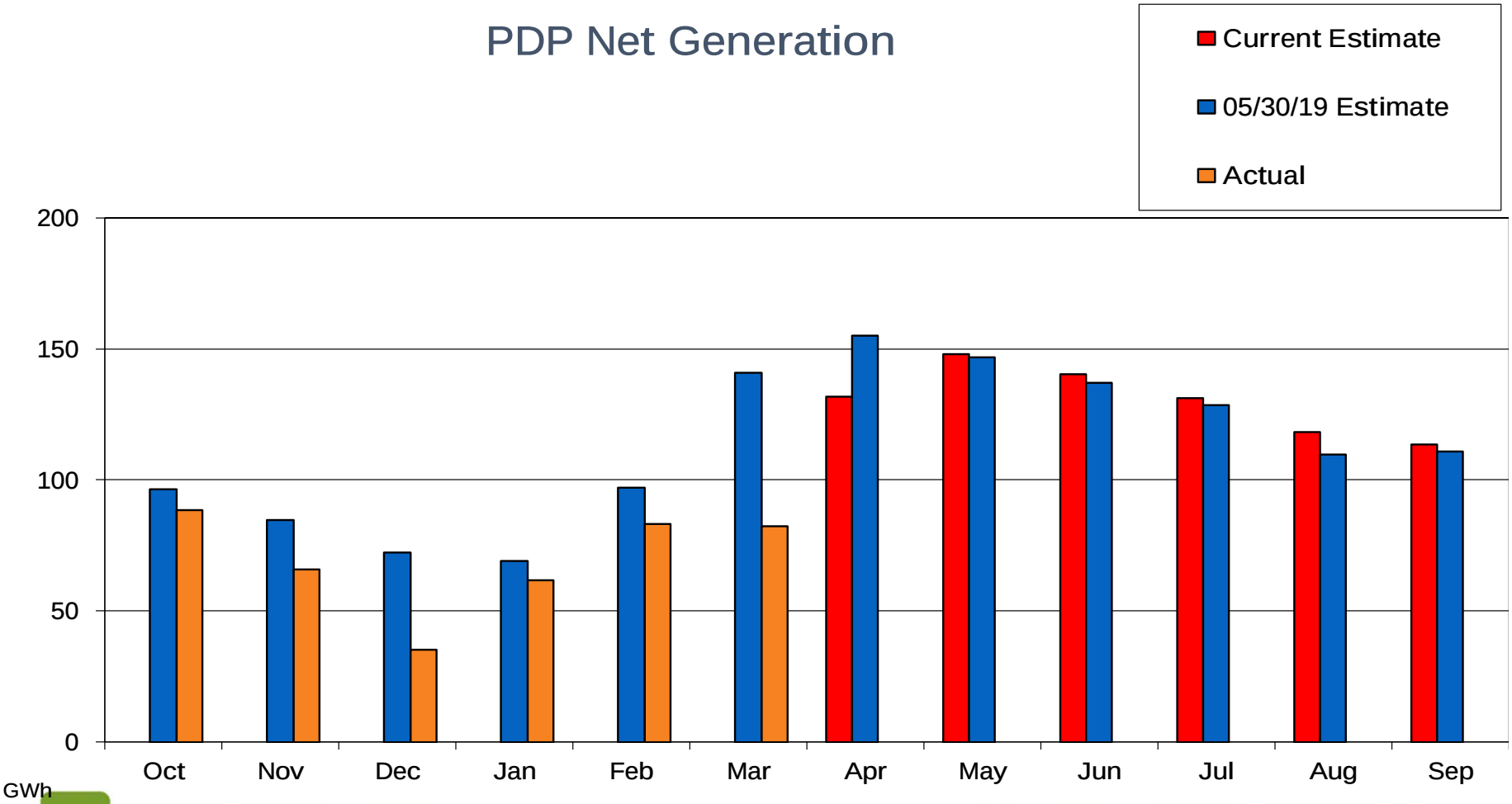
ENERGY COSTS
$6,885,806

RESERVES COSTS
$729,659

+ values represent energy from P-DP
- values represent energy to P-DP

Status FY 2020 AOP

Current Est. Total Gen 1199.5 GWh
05/30/19 Est. Total Gen 1348.5 GWh



Current Status FY 2020 AOP

Parker-Davis Project

	Prior Year Balance	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
		Actual GWh						Estimates GWh						
Resources														
Parker Generation		30.2	20.2	9.4	22	28	30	44.4	49.02	47.2	46.7	41.1	34.5	402.7
MWD's Parker Share		-15	-10.03	-4.683	-10.33	-13.74	-15	-22.2	-24.51	-23.6	-23.35	-20.55	-17.25	-200.2
Davis Generation		73.2	55.6	30.5	49.9	68.9	67.4	109.7	123.4	116.8	107.7	97.6	96.3	997.0
Net Generation		**88.4**	**65.8**	**35.2**	**61.6**	**83.2**	**82.4**	**131.9**	**148.0**	**140.4**	**131.1**	**118.2**	**113.6**	**1199.5**
Other PDP Credits		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.6
Purchases for PDP		9.2	11.1	33.4	23.0	9.7	40.6	13.8	6.3	8.9	17.2	23.9	23.2	220.2
Total Resources:		**97.8**	**77.1**	**68.8**	**84.8**	**93.1**	**123.2**	**145.9**	**154.4**	**149.5**	**148.5**	**142.2**	**136.9**	**1422.3**
Loads														
Total PDP Firm Load		83.0	79.0	80.4	80.0	73.9	147.1	145.7	149.3	146.3	151.5	150.1	144.3	1430.7
Energy Bank Sales		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Excess		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Surplus Sales		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PDP / BA Deviation	0.9	8.2	4.7	-6.6	6.3	12.1	-22.7	-0.1	5.7	4.0	-1.4	-5.7	-5.3	0.0
Hoover Bank	7.5	6.6	-6.7	-4.9	-1.5	7.1	-1.3	0.3	-0.6	-0.8	-1.6	-2.2	-2.1	0.0
Total Loads:		**97.8**	**77.1**	**68.8**	**84.8**	**93.1**	**123.2**	**145.9**	**154.4**	**149.5**	**148.5**	**142.2**	**136.9**	**1422.3**

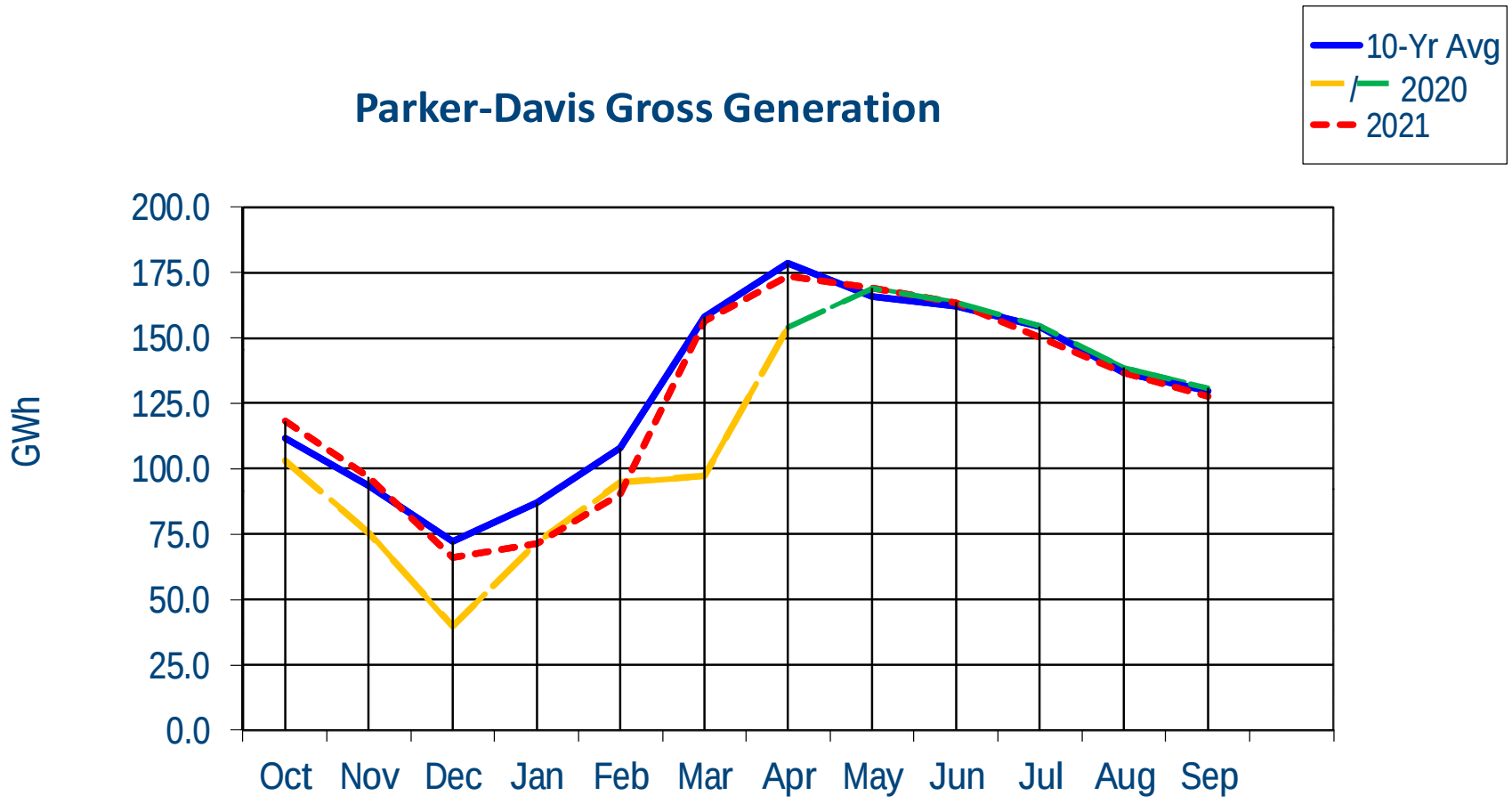
TOTAL FY 2020 PURCHASE POWER COSTS
$10,479,668

ENERGY COSTS
$9,940,396

RESERVES COSTS
$539,272

+ values represent energy from P-DP
- values represent energy to P-DP

USBR Generation Projections



(2020: Actual Oct – Apr)

Preliminary FY 2021 AOP

Parker-Davis Project

Estimates GWh

	Prior Year Balance	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Resources														
Parker Generation		30.2	22.5	13.3	16	25.5	41.2	46.5	46.9	47.8	45.9	40.9	34.5	411.2
MWD's Parker Share		-15	-11.25	-6.65	-8	-12.75	-20.6	-23.25	-23.45	-23.9	-22.95	-20.45	-17.25	-205.5
Davis Generation		88	74.5	52.8	55.6	64.7	115.3	127	122.2	115.5	104.4	96	93.2	1109.2
Net Generation		**103.2**	**85.8**	**59.5**	**63.6**	**77.5**	**135.9**	**150.3**	**145.7**	**139.4**	**127.4**	**116.5**	**110.5**	**1314.9**
Other PDP Credits		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.6
Purchases for PDP		5.0	5.0	12.4	10.6	5.0	8.5	5.0	5.6	6.9	13.6	17.3	17.4	112.1
Total Resources:		**108.4**	**90.9**	**72.0**	**74.4**	**82.6**	**144.6**	**155.4**	**151.5**	**146.5**	**141.2**	**134.0**	**128.1**	**1429.7**
Loads														
Total PDP Firm Load		83.0	79.0	80.4	80.0	73.7	146.9	145.2	149.3	146.3	151.5	150.1	144.3	1429.7
Energy Bank Sales		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Excess		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Surplus Sales		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PDP / BA Deviation	0.0	5.2	5.2	-3.6	-1.5	5.2	1.0	5.2	4.4	2.9	-5.0	-9.4	-9.5	0.0
Hoover Bank	0.0	20.2	6.7	-4.8	-4.1	3.8	-3.3	5.0	-2.2	-2.7	-5.3	-6.7	-6.7	0.0
Total Loads:		**108.4**	**90.9**	**72.0**	**74.4**	**82.6**	**144.6**	**155.4**	**151.5**	**146.5**	**141.2**	**134.0**	**128.1**	**1429.7**

TOTAL FY 2021 PURCHASE POWER COSTS
$6,027,020

ENERGY COSTS
$5,118,634

RESERVES COSTS
$908,385

+ values represent energy from P-DP
- values represent energy to P-DP

Markets Update

- Market Study Overview
  - Benefit study
  - Gap or cost analysis
- Current status
- Market study completion

Parker-Davis Project Post 2028 Marketing Initiative

- WAPA is beginning the Parker-Davis Project (PD-P) Post 2028 Power Marketing Initiative
- Points of Contact:
  - Stacy Russ, Power Marketing Advisor & Project Manager
  - Jim Kendrick, Vice President of Power Marketing
  - General Inquiries: PDP-ReMarketing@wapa.gov
- Website: https://www.wapa.gov/regions/DSW/Pages/PDPRemarketing.aspx
- WAPA is still in the scoping phase. We will be holding informal customer meetings later this summer. We look forward to meeting with everyone and gaining your valuable input going forward.

Contact Information

Stacy Russ
Power Marketing Advisor
russ@wapa.gov
(602) 605-2885

Xavier Gonzalez
Resource Planning Engineer
xgonzalez@wapa.gov
(602) 605-2678

Jim Kendrick
Vice President of Power Marketing
kendrick@wapa.gov
(602) 605-2555

John Paulsen
Energy Management and Marketing Manager
paulsen@wapa.gov
(602) 605-2557

Rose Statler / Dave Young
Hoover Portal Administrators
HooverPortal@WAPA.GOV
Rose: (602) 605-2494
Dave: (602) 605-2859