

SIXTY-SEVENTH ANNUAL REPORT

OF THE

# Upper Colorado River Commission



SALT LAKE CITY, UTAH

SEPTEMBER 30, 2015

# Upper Colorado River Basin

Colorado River Storage Project  
Units and Participating Projects





# UPPER COLORADO RIVER COMMISSION

355 South 400 East • Salt Lake City • Utah 84111 • 801-531-1150 • FAX 801-531-9705

April 1, 2016

President Barack H. Obama  
The White House  
Washington, D.C. 20500

Dear President Obama:

The Sixty-Seventh Annual Report of the Upper Colorado River Commission, as required by Article VIII(d)(13) of the Upper Colorado River Basin Compact, is enclosed.

The budget of the Commission for fiscal year 2016 (July 1, 2015 – June 30, 2016) is included in this report as Appendix B.

In accordance with Article VIII of the Upper Colorado River Basin Compact this report has also been transmitted to the Governor of each State signatory to the Upper Colorado River Basin Compact, which includes Colorado, New Mexico, Utah, Wyoming and Arizona.

Respectfully yours,

Don A. Ostler, P.E.  
Executive Director

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## Acknowledgements:

**The Upper Colorado Region of the U.S. Bureau of Reclamation contributed substantially to the text and technical content of this report.**



## PREFACE

Article VIII(d)(13) of the Upper Colorado River Basin Compact requires the Upper Colorado River Commission to “make and transmit annually to the Governors of the signatory States and the President of the United States of America, with the estimated budget, a report covering the activities of the Commission for the preceding water year.”

Article VIII(1) of the By-Laws of the Commission specifies that “the Commission shall make and transmit annually on or before April 1 to the Governors of the states signatory to the Upper Colorado River Basin Compact and to the President of the United States a report covering the activities of the Commission for the water year ending the preceding September 30.”

This Sixty-Seventh Annual Report of the Upper Colorado River Commission has been compiled pursuant to the above directives.

This Annual Report includes, among other things, the following:

- Membership of the Commission, its Committees, Advisers, and Staff;
- Roster of meetings of the Commission;
- Brief discussion of the activities of the Commission;
- Engineering and hydrologic data;
- Pertinent legal information;
- Information pertaining to congressional legislation;
- Map of the Upper Colorado River Basin;
- Status of the Storage Units and participating projects of the Colorado River Storage Project;
- Appendices containing: Fiscal data, such as budget, balance sheet, statements of revenue and expense.

A special thanks is in order to the many staff of the U.S. Bureau of Reclamation who have contributed most significantly to the text and data presented herein.

## COMMISSION



**Amy Haas**  
Commissioner for  
New Mexico  
Appointed 3/5/2015



**James Eklund**  
Commissioner for  
Colorado  
Appointed 2/6//2015



**Felicity Hannay**  
Chairwoman  
Commissioner for  
United States



**Eric L. Millis**  
Commissioner for  
Utah



**Patrick T. Tyrrell**  
Commissioner for  
Wyoming

## **ALTERNATE COMMISSIONERS**

Mike King	State of Colorado
John R. Stulp	State of Colorado
John H. McClow	State of Colorado
Dallin W. Jensen	State of Utah
Robert V. King	State of Utah
Dan S. Budd	State of Wyoming
Benjamin C. Bracken	State of Wyoming
Tom Blaine	State of New Mexico

## **OFFICERS OF THE COMMISSION**

Chairwoman	Felicity Hannay
Vice Chairman	Patrick T. Tyrrell
Secretary	Don A. Ostler
Treasurer	Silvia Norman
Assistant Treasurer	Sergio Boderio

## **STAFF**

Executive Director	Don A. Ostler
Assistant to the Executive Director and General Counsel	Jane Bird
Administrative Secretary	Teri Kay Gomm

## COMMITTEES

The Committees of the Commission convened several times during the year. Committees and their membership at the date of this report are as follows (the Chairman and the Secretary of the Commission are ex-officio members of all committees, Article V(4) of the By-Laws):

### Legal Committee:

Norman K. Johnson, Chairman – Utah  
Dallin W. Jensen – Utah  
Scott Balcomb – Colorado  
Jim Lochhead – Colorado  
Bennett Raley – Colorado  
Steve Farris – New Mexico  
Chris Brown - Wyoming  
Amy Haas – New Mexico  
Mike King – Colorado

Cynthia H. Coffman – Colorado  
Ted Kowalski – Colorado  
Barry Spear – Colorado  
Karen Kwon – Colorado  
Peter Fleming – Colorado  
Mike Quealy – Utah  
Lee Miller - Colorado  
Shanti Rosset - Colorado

### Engineering Committee

Eric Kuhn, Chairman - Colorado  
Kristin N. Green - New Mexico  
Mike Sullivan – Colorado  
Paul Harms - New Mexico  
Steve Wolff – Wyoming  
Michelle Garrison – Colorado  
Ted Kowalski – Colorado

Bruce Whitehead – Colorado  
Mike King - Colorado  
Kevin Flanigan – New Mexico  
Robert King – Utah  
D. Randolph Seaholm – Colorado  
Kent Jones – Utah

### Budget Committee:

James Eklund – Colorado  
Eric L. Millis – Utah

Patrick T. Tyrrell – Wyoming  
Amy Haas – New Mexico

## GENERAL ADVISERS TO COMMISSIONERS

The following individuals serve as advisors to their respective Commissioner:

### Utah:

Gene Shawcroft  
Manager  
Central Utah Water Conservancy District  
Orem, Utah

Gawain Snow  
General Manager  
Uintah Water Conservancy District  
Vernal, Utah

### Colorado:

John R. Stulp  
Denver, Colorado  
Special Policy Advisor to the Governor for Water  
IBCC Director

## MEETINGS OF THE COMMISSION

During the Water Year ending September 30, 2015 the Commission met as follows:

Meeting No. 269 December 10, 2014

Las Vegas, Nevada

Meeting No. 270 June 18, 2015

Durango, Colorado

Meeting No. 271 July 1, 2015

Held by telephone  
according to Bylaws

## ACTIVITIES OF THE COMMISSION

### General Activities:

Within the scope and limitations of Article 1(a) of the Upper Colorado River Basin Compact and under the powers conferred upon the Commission by Article VIII(d), the principal activities of the Commission have consisted of: (A) research and studies of an engineering and hydrologic nature of various facets of the water resources of the Colorado River Basin especially as related to operation of the Colorado River reservoirs; (B) collection and compilation of documents for the legal library relating to the utilization of waters of the Colorado River System for domestic, industrial and agricultural purposes, and the generation of hydroelectric power; (C) legal analyses of associated laws, court decisions, reports and problems; (D) participating in activities and providing comments on proposals that would insure and allow the beneficial consumptive uses in the Upper Basin, including environmental, fish and wildlife, endangered species and water quality activities; (E) cooperation with water resources agencies of the Colorado River Basin States on water and water-related problems; (F) an education and information program designed to aid in securing planning and investigation of storage dams, reservoirs and water resource development projects of the Colorado River Storage Project that have been authorized for construction and to secure authorization for the construction of additional participating projects as the essential investigations and planning are completed; and (G) a legislative program consisting of the analysis and study of water resource bills introduced in the U.S. Congress for enactment, the preparation of evidence and argument and the presentation of testimony before the Committees of the Congress.

### Specific Activities:

The Commission, its full time staff and the Engineering and Legal Committees have been very actively involved in matters pertinent to the administration of the Colorado River. In addition to the above Commission meetings, a large number of additional work meetings, Committee meetings, work groups and conference calls have been held under the authority of the Commission. Activities have included but are not limited to: Meetings regarding implementation of Coordinated Reservoir Operations and Shortage Management, environmental issues below Glen Canyon Dam, Mexico shortage issues, augmentation of the Colorado River supply, climate change impacts to water supply, annual operations plans for Glen Canyon Dam, curtailment avoidance, Lees Ferry gage flow measurements, Upper Basin water demand and depletion schedules, future water supply and demand studies, drought mitigation/contingency planning, Pilot System Conservation Projects and various legal matters.

### **Oversight and Administration of Implementation of the Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead:**

The Commission and Upper Division States have been heavily involved during the eighth year of operations under the 2007 Interim Guidelines. Under the Interim Guidelines operating

rules the release from Lake Powell to the lower Colorado River basin was dropped for the first time from 8.23 maf to an objective of 7.48 maf reflecting low storage conditions at that time in Lake Powell. Since the August 24-month study is used to predict storage elevations in Lake Powell which then determine the operational and release tier for the following year, the Commission has focused much attention on the accuracy of the modeled predictions. In a previous year this over-prediction of elevation placed Lake Powell in the equalization tier when in actuality the reservoir elevations never achieved the equalization level. It was determined that the assumptions for bank storage, Powell inflow and the averaging period for hydrology, as well as forecast error may be affecting accuracy. Modifications to the 24-month study model were made incorporating mass balance assumptions for inflow, new estimates of bank storage and an updated 30-year hydrology average during 2012. The Commission continues to evaluate the accuracy of the 24-month study predictions, and more work needs to be done. In water year 2013, the difference between the August 24-month study predicted elevation and actual elevation of Lake Powell for January 1 was 5.3 feet. In water year 2014, the difference between the August prediction and actual January 1 elevation was just 1.0 foot and in water year 2015, 1.8 feet. The Commission will continue to monitor this issue during 2016. It must be understood that the accuracy of reservoir elevation predictions five months in advance of January 1 to facilitate Interim Guidelines decisions depends both on the accuracy of the model to approximate reservoir elevations, but also on the ability to predict weather, precipitation and runoff during the period. The Commission is also gathering information on possible changes to future guidelines based upon operating experience that may improve the guidelines or may be needed if they are considered for extension beyond the year 2026.

### **Negotiations with Mexico Regarding Shortage Sharing and Augmentation of the Supply:**

The Commission and Upper Division States were actively involved with the Department of the Interior in discussion with the Mexican counterparts on how to better manage and share future shortages as well as meet future demands for water. This includes using storage more efficiently as well as implementing additional conservation measures within both nations. Considerable effort was also expended to evaluate means of enhancing the supply and in evaluating possible affects in salinity and water quality. An historic Minute No. 319 to the Mexican Water Treaty of 1944 was signed on November 20, 2012 in Coronado, California by the U.S. and Mexican Commissioners of the International Boundary and Water Commission (IBWC). Prerequisite agreements were signed by the seven basin states and the Upper Colorado River Commission to allow adoption of Minute 319. During 2014 the Commission and its staff have been actively involved with Interior and IBWC in implementing Minute 319. Significant work has been accomplished in evaluating basin hydrology and possible new shortage triggers as well as implementation details for new projects to conserve or provide water and the delivery of environmental flows. During 2015 and 2016 the Commission staff and states have participated with the Department of the Interior and IBWC to extend Minute 319 which is due to expire at the end of 2017. These negotiations are ongoing and will involve additional shortage sharing or conservation, storage opportunity in US reservoirs and joint projects to improve efficiency or extend the supply.

### **Implementation of the Colorado River Basin Fund MOA:**

Agreement was reached during water year 2011 on a Memorandum of Agreement (MOA) with the Colorado River Energy Distributors Association, Reclamation, Western Area Power Administration and the Upper Division States to allow basin funds to be used for future state development projects as well as operation, maintenance, and replacement of existing CRSP related projects. Projects have been proposed for funding and are now in the process of implementation as new projects are being developed and proposed. Approximately \$100 million in projects to benefit Upper Basin states have been approved.

## **Lees Ferry Stream Gage on the Colorado River:**

The Commission continues to study the differences between flow measurement at Glen Canyon Dam and Lees Ferry, which is nearest to the Colorado River Compact measuring point at Lee Ferry, Arizona (16 miles below Glen Canyon Dam). This flow measuring point is extremely important in administration of the 1922 Colorado River Compact. The USGS, after consultation with the Commission, has completed improvements to flow measuring equipment that have improved its accuracy. In addition, during Water Year 2011, the USGS conducted field measurements of inflow between Glen Canyon Dam and Lees Ferry, which documented gains in flow. Approximately 104,000 additional acre-ft. passed Lee Ferry than was released from the dam in Water Year 2014. From 2007 to 2015 the average increase in flow at Lee Ferry compared to the dam release is 145,000 acre-ft. per year. During 2015, the gain in this reach was 153,000 ac-ft. Over the last ten years, the cumulative gain at Lees Ferry compared to Glen Canyon Dam release records is 1,307,000 ac-ft. The Commission is continuing to evaluate how this information should be incorporated into dam operations.

## **Upper Division States Drought Contingency Planning:**

The Commission and its engineering and legal advisors are continuing to develop drought contingency plans to avoid or reduce the adverse effects on Upper Basin water users from low reservoir conditions. Evaluations include analyzing how to optimize and coordinate all CRSP storage to mitigate the effects of low reservoir conditions on water users as well as evaluation of voluntary conservation and water banking activities. The components of the upper basin plan will include continuation and expansion of current weather modification efforts, coordinated drought operation of upper CRSP reservoirs to avoid critical low elevations in Powell and detailed study of demand management actions to avoid critical low reservoir elevations. Preliminary modeling indicates that these actions may significantly reduce the risk of critical low reservoir conditions occurring in Lake Powell. These actions have the potential of reducing the risk of compact compliance issues occurring and will help avoid loss of power generation with all of its many benefits. The Commission and states are interested in having an acceptable contingency plan on the shelf for these very low probability hydrology scenarios which have such high consequences. This plan will be thoroughly vetted with stakeholders.

## **Colorado River Basin Supply and Demand Study:**

The Commission, all seven Colorado River Basin States, many large water users within the Basin and the Department of the Interior have participated in completion of a study to quantify current and future demand and supply using various assumptions for future hydrology to identify possible imbalances. All methods to address the supply imbalance, including conservation, efficiency and augmentation, are now being evaluated. Efforts during WY 2014 have been to evaluate next steps including detailed work with stakeholder committees on agricultural conservation, municipal and industrial conservation as well as environmental flow needs. Additional work will occur during water year 2016.

## **System Water Conservation Pilot Program:**

In response to the current 16 year drought in the Colorado River Basin and declining reservoir elevations, four major water suppliers including Central Arizona Project, Denver Water, The Metropolitan Water District of Southern California, and Southern Nevada Water Authority along with the U.S. Bureau of Reclamation contributed \$11 million to assist the Colorado River Basin States in drought contingency planning. The purpose of these funds was to fund water conservation projects in a cooperative, temporary and voluntary manner to demonstrate the viability of reducing water demand in order to avoid critical low reservoir conditions. From the initial contributions \$2.75 million was to be spent in the upper basin. The Upper Colorado River Commission has become the management agency for administering these funds and awarding projects to conserve water dedicated to the Colorado River System with the substantial support of the upper division states.



To date, 28 projects have been identified for funding during WY 2015 and WY 2016. Projects have or will occur in all four upper division states and are intended to reduce water demand in areas of agriculture and municipal uses. The completed projects and those identified for current funding are expected to conserve at least 11,300 ac-ft. of water to the Colorado River System at a total cost of about \$2.5 million. These projects have already demonstrated that there is an interest in compensated, temporary and voluntary water reductions in time of severe drought. These projects are also allowing the upper basin to learn many aspects about administration of such an effort regarding contracting, verification and disposition of the conserved water etc. The upper division states and the Commission believe it is prudent in critical low reservoir situations to take proactive steps to manage the drought to ease the burdens upon all water users in the upper basin.

**A. ENGINEERING-HYDROLOGY**

**1. Stream Flow and Hydrology Summary**

The historical flow of the Colorado River at Lee Ferry for water year 2015 based upon USGS stream flow records at the Lee’s Ferry and Paria River gages was 9,157,000 acre-feet. The progressive 10-year total flow at Lee Ferry was 90,750,000 acre-feet (2006 to 2015).

The virgin or natural flow of the Colorado River at Lee Ferry was estimated to be 14.2 million acre-feet, which is less than the average virgin flow for the period of record of 14.6 million acre-feet (1896 to 2015).

In the Upper Colorado River Basin during Water Year 2015, the overall precipitation accumulated through September 30, 2015 was approximately 90% of average based upon the 30 years of data between the years of 1981 and 2010. Unregulated inflow to Lake Powell in Water Year 2015 was about 94% of the 30-year average, or 10.819 million acre-feet (maf).

The Upper Colorado River Basin continues to experience a protracted drought that began in October 1999. Unregulated inflow to Lake Powell has varied during this time as follows:

**Unregulated Inflow to Lake Powell**

2000 - 62%
2001 - 59%
2002 - 25%
2003 -51%
2004 - 49%
2005 - 105%
2006 – 73%
2007 – 68%
2008 – 102%
2009 – 88%
2010 – 73%
2011 – 139%
2012 – 45%
2013 – 47%
2014 – 96%
2015 – 94%

Inflow has been above average in only 3 of the last 16 years, which is the lowest 16-year period since the closure of Glen Canyon Dam in 1963.



Runoff adjusted for change in storage in Colorado River Storage Project reservoirs for the water year ending September 30, 2015 was 95% of the long-term average at the San Juan River station near Bluff, Utah and 92% of the long-term average at the Colorado River Station near Cisco, Utah. The volumes of runoff at these stations were 1,456,100 acre-feet and 4,942,700 acre-feet, respectively. Runoff at the Green River station near Green River, Utah was 81% of the long-term average and totaled 3,487,900 acre-feet.

## **2. Summary of Reservoir Levels and Contents**

As of September 30, 2015 total system storage (Upper and Lower Basins) was 58.8% of capacity. For the period October 1, 2014 through September 30, 2015, the change in reservoir storage, excluding bank storage and evaporation, at selected Upper Basin reservoirs was as follows:

- Fontenelle decreased 60,200 acre-feet
- Flaming Gorge increased 162,000 acre-feet
- Taylor Park decreased 5,100 acre-feet
- Blue Mesa increased 126,400 acre-feet
- Morrow Point decreased 7,500 acre-feet
- Crystal decreased 800 acre-feet
- Navajo increased 331,200 acre-feet
- Lake Powell increased 47,300 acre-feet

The virgin flow<sup>1</sup> of the Colorado River at Lee Ferry<sup>2</sup> for the 2015 water year was estimated to be 14.2 million acre-feet.<sup>3</sup>

Observed inflows to Lake Powell during Water Year 2015 were below average (94%); Lake Powell storage increased by 47.3 kaf and ended the water year at 50.7% of capacity, with 12.33 maf of storage at elevation 3,606.01 feet. A more detailed description of Lake Powell conditions is found in section H of this report. The release from Lake Powell during Water Year 2015 was 9.0 maf.

Reservoir storage in Lake Mead decreased during Water Year 2015 from 10,121,000 acre-feet to 9,854,000 acre-feet, which is 37.7% of capacity. The total Colorado River System experienced a gain in storage during Water Year 2015 of approximately 419,000 acre-feet and ended the year at 50.9% of capacity.

Table 1 on page 11 shows the statistical data for principal reservoirs in the Upper Colorado River Basin. Table 2 on page 12 shows the same information for the Lower Colorado River Basin reservoirs.

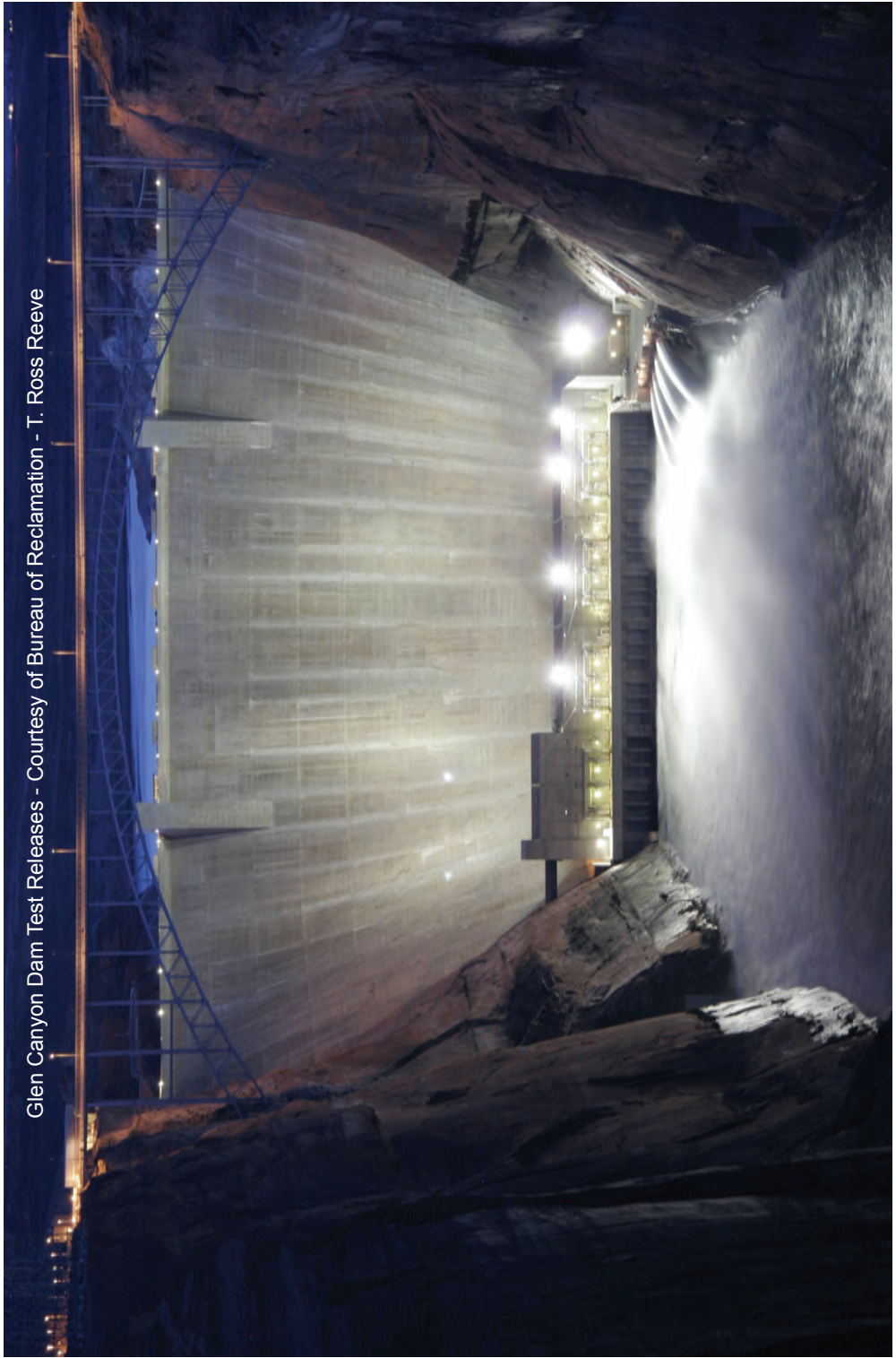
The results of the long-range reservoir operation procedures and the Interim Guidelines for Lower Basin Shortage and Coordinated Reservoir Operating Criteria as adopted by the Secretary of the Interior for Powell, Flaming Gorge, Fontenelle, Navajo, and Blue Mesa Reservoirs in the Upper Colorado River Basin and Lake Mead in the Lower Basin are illustrated on pages 13 through 19 for the 2015 Water Year.

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<sup>1</sup> Virgin flow is the estimated flow of the stream if it were in its natural state and unaffected by the activities of man.

<sup>2</sup> Lee Ferry, Arizona is the division point between the upper and lower basins of the Colorado River as defined in the Colorado River Compact. It is located about one mile downstream from the mouth of the Paria River and about 16 miles downstream from Glen Canyon Dam.

<sup>3</sup> Based on provisional records subject to revision.



Glen Canyon Dam Test Releases - Courtesy of Bureau of Reclamation - T. Ross Reeve

**Table 1**  
**STATISTICAL DATA FOR PRINCIPAL RESERVOIRS IN COLORADO RIVER BASIN**  
**UPPER BASIN**

Colorado River Storage Project  
(Total Surface Capacity)  
(Units: Elevation = feet; Capacity = 1,000 acre-feet)

	Fontenelle		Flaming Gorge		Taylor Park		Blue Mesa		Morrow Point		Crystal		Navajo		Lake Powell	
	Elev.	Cap.	Elev.	Cap.	Elev.	Cap.	Elev.	Cap.	Elev.	Cap.	Elev.	Cap.	Elev.	Cap.	Elev.	Cap.
River elevation at dam (average tailwater)	—	—	5,603	0	9,174	0	7,160	0	6,775	0	6,534	0	5,720	0	3,138	0
Dead Storage	6,408	0.56	5,740	40	—	—	7,358	111	6,808	0	6,670	8	5,775	13	3,370	1,893
Inactive Storage																
(minimum power pool)	—	—	5,871	273	—	—	7,393	192	7,100	75	6,700	12	5,990 <sup>4</sup>	673	3,490	5,890
Rated Head	6,491	234	5,946	1,102	—	—	7,438	361	7,108	80	6,740	20	—	—	3,570	11,000
Maximum Storage	6,506	345	6,040	3,789	9,330	106	7,519	941	7,160	117	6,755	25	6,085	1,709	3,700	26,215

<sup>4</sup> The elevation for inactive storage for Navajo Reservoir is required for the Navajo Indian Irrigation Project.

Table 2

STATISTICAL DATA FOR PRINCIPAL RESERVOIRS IN COLORADO RIVER BASIN

LOWER BASIN

(Usable Surface Capacity)

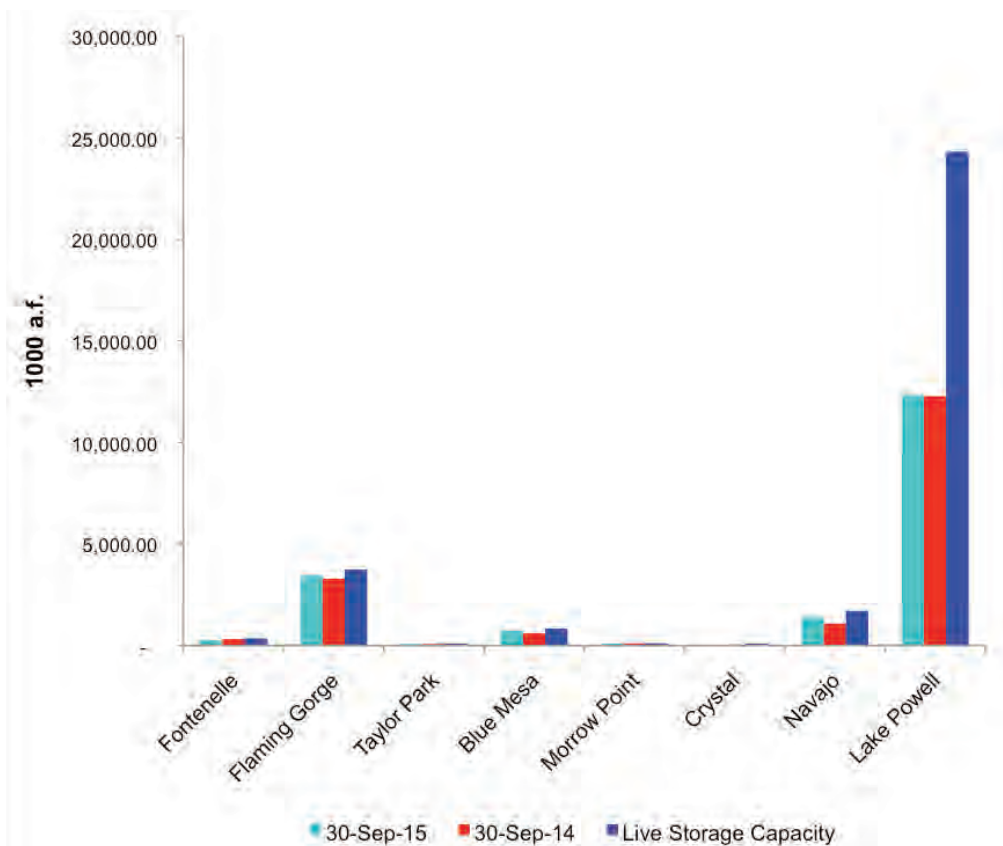
(Units: Elevation = feet; Capacity = 1,000 acre-feet)

	Lake Mead		Lake Mohave		Lake Havasu	
	Elev.	Capacity	Elev.	Capacity	Elev.	Capacity
River elevation at dam (average tailwater)	646	-2,378	506	-8.5	370	-28.6
Dead Storage	895	0	533.39	0	400	0
Inactive Storage (minimum power pool)	1,050	7,471	570	217.5	440 <sup>5</sup>	439.4
Rated Head	1,122.80	13,633	-	-	-	-
Maximum Storage (without surcharge)	1,221.40	26,159	647	1,809.80	450	619.4

<sup>5</sup> The elevation for inactive storage for Lake Havasu is the contractual minimum for delivery to Metropolitan Water District's Colorado River Aqueduct.

**Storage in Principle Reservoirs at the End of Water Year 2015**  
**Upper Basin**  
**Live Storage Contents**

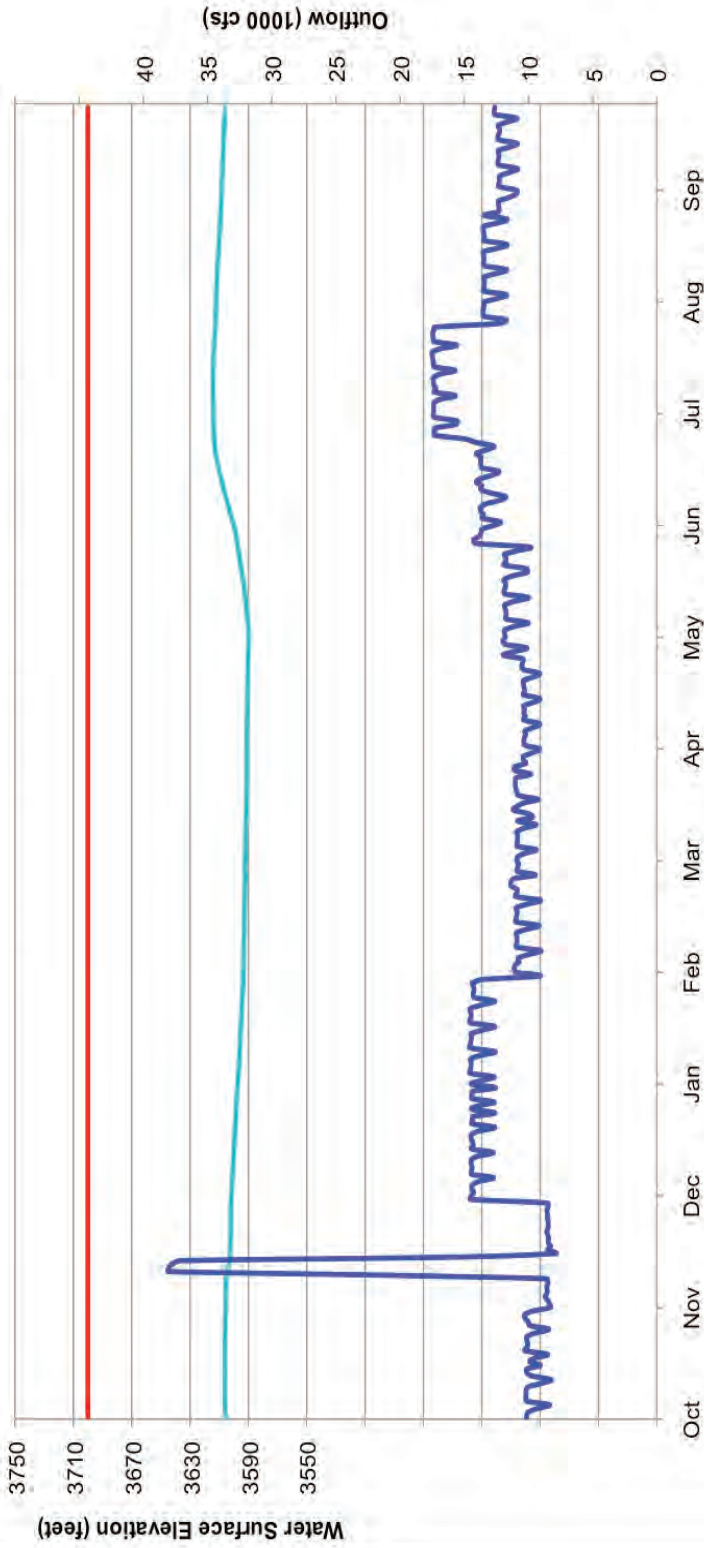
<b>Reservoir</b>	<b>Sept 30, 2015 (acre-feet)</b>	<b>Percent Live Capacity</b>	<b>Sept 30, 2014 (acre-feet)</b>	<b>Percent Live Capacity</b>	<b>Change in Contents (acre-feet)</b>
Fontenelle	253,700	91.0%	313,900	91.0%	(60,200)
Flaming Gorge	3,450,100	87.7%	3,288,100	87.7%	162,000
Taylor Park	71,700	72.3%	76,800	72.3%	(5,100)
Blue Mesa	725,600	72.3%	599,200	72.3%	126,400
Morrow Point	104,500	95.7%	112,000	95.7%	(7,500)
Crystal	14,600	87.8%	15,400	87.8%	(800)
Navajo	1,391,800	62.3%	1,060,600	62.3%	331,200
Lake Powell	12,332,900	50.5%	12,285,600	50.5%	47,300
<b>Total</b>	<b>18,344,900</b>	<b>58.8%</b>	<b>17,751,600</b>	<b>56.9%</b>	<b>593,300</b>



# Lake Powell - Glen Canyon

Live Storage Capacity - 24,322,000 acre-ft  
Power Generation Capacity - 1,320,000 KW  
Live Storage 9/30/15 - 12,332,900acre-feet

- Water Surface Elevation (ft)
- Maximum Storage Elev = 3700 ft  
(Content 27,000,000 af)
- Outflow (1000 cfs)



Lake Powell  
Water Year 2015



# Flaming Gorge

Live Storage Capacity - 3,749,000 acre-feet  
Power Generation Capacity - 151,500 KW  
Live Storage 9/30/15 - 3,450,100 acre-feet

- Water Surface Elevation (ft)
- Maximum Storage Elev = 6040 ft  
(Content = 3,789,000 af)
- Outflow (1000 cfs)

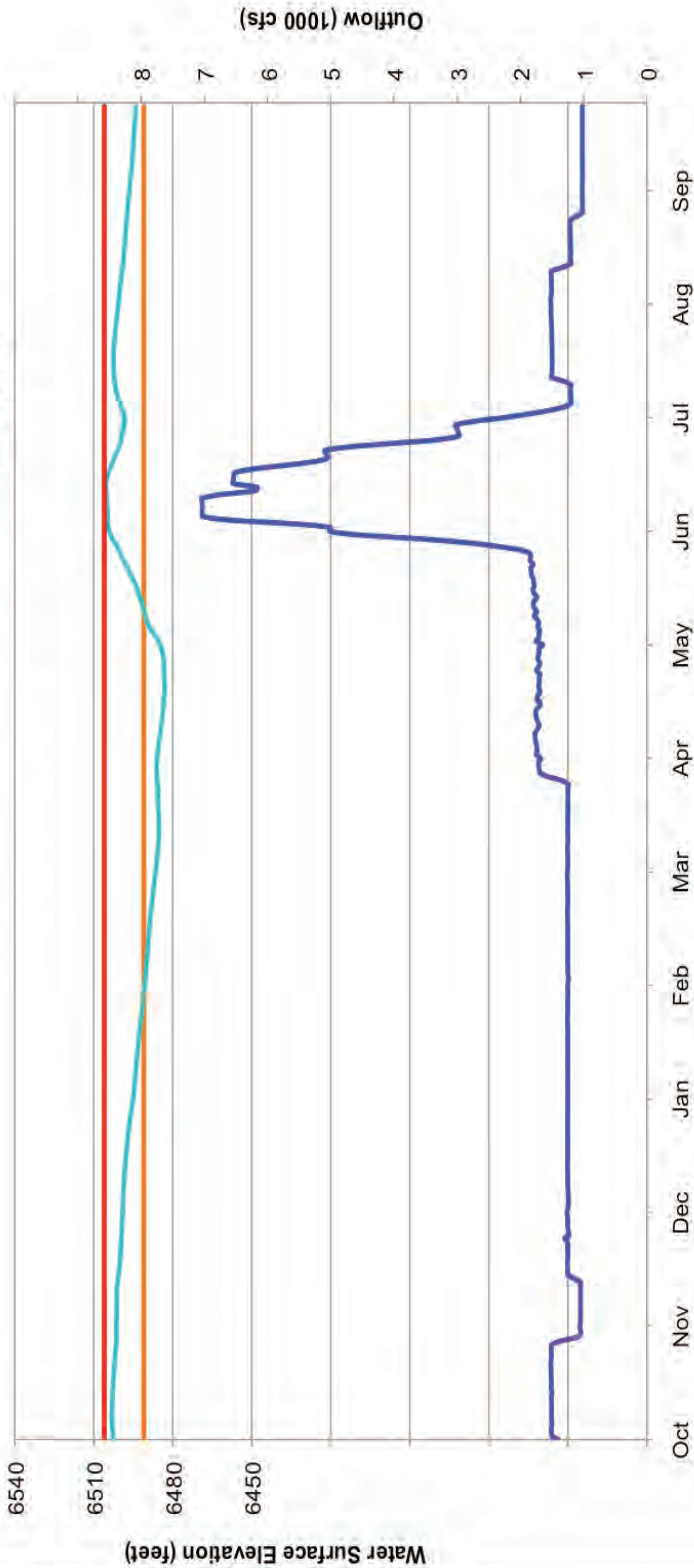


Flaming Gorge Reservoir  
Water Year 2015

# Fontenelle

Live Storage Capacity - 344,800 acre-feet  
Power Generation Capacity - 10,000 KW  
Live Storage 9/30/15 - 253,700 acre-feet

- Rated Head Elev. = 6491 ft (Content = 234,000 af)
- Water Surface Elevation (ft)
- Maximum Storage Elev. = 6506 ft (Content = 345,000 af)
- Outflow (1000 cfs)



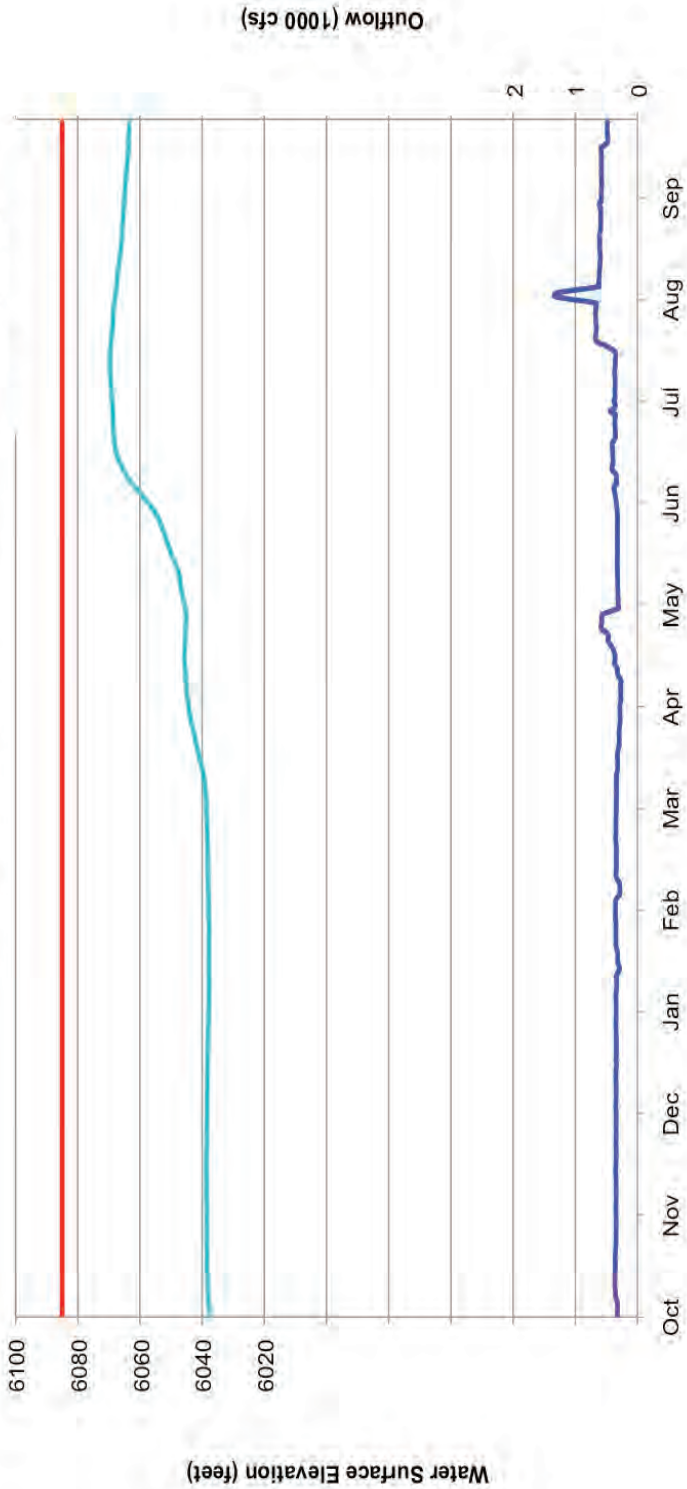
Fontenelle Reservoir  
Water Year 2015



# Navajo

Live Storage Capacity - 1,701,300 acre-feet  
Power Generation Capacity - 0 KW  
Live Storage 9/30/15 - 1,391,800 acre-feet

Maximum Storage Elev = 6085 ft  
(Content = 1,709,000 af)  
Outflow (1000 cfs)

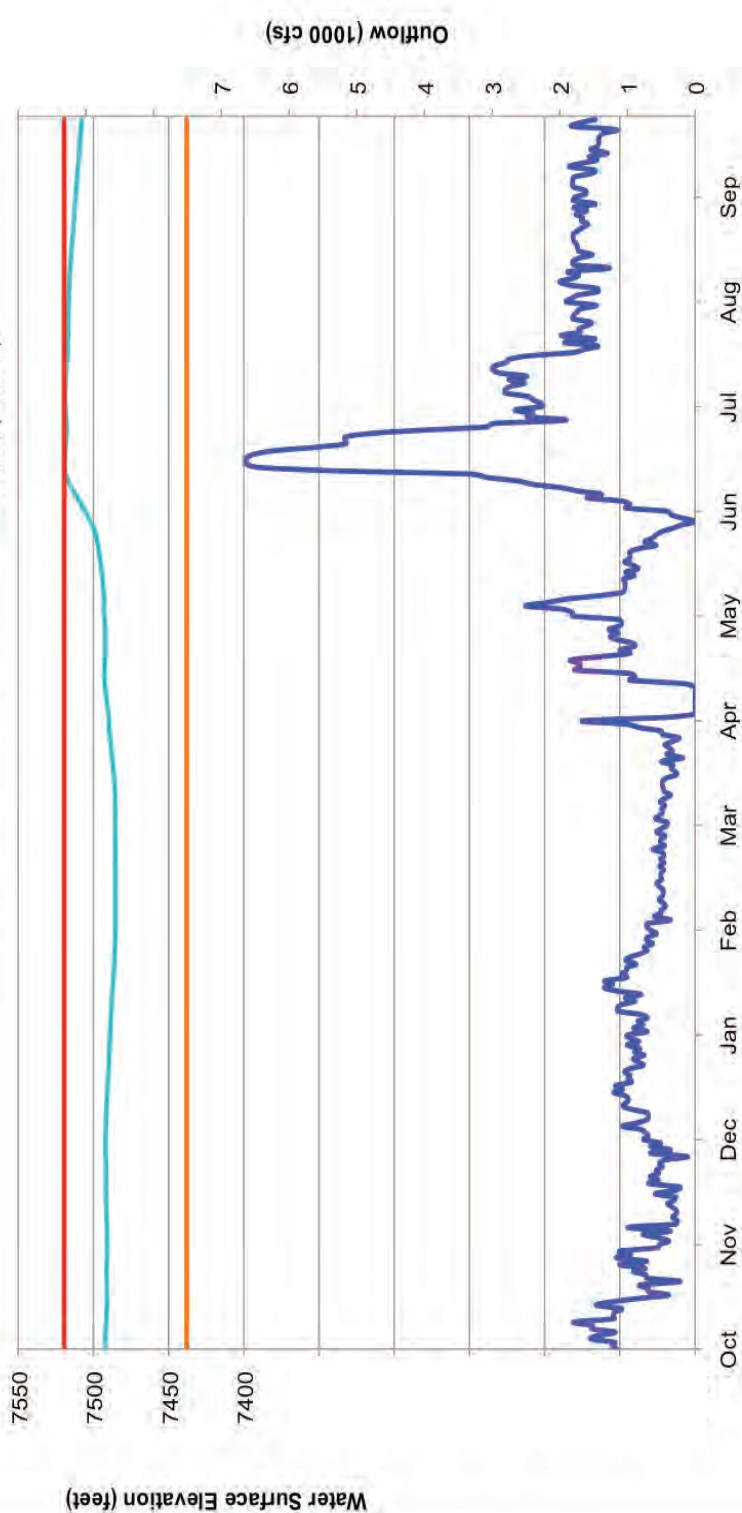


Navajo Reservoir  
Water Year 2015

Blue Mesa

Live Storage Capacity - 829,000 acre-feet  
Power Generation Capacity - 86,400 KW  
Live Storage 9/30/15 - 725,600 acre-feet

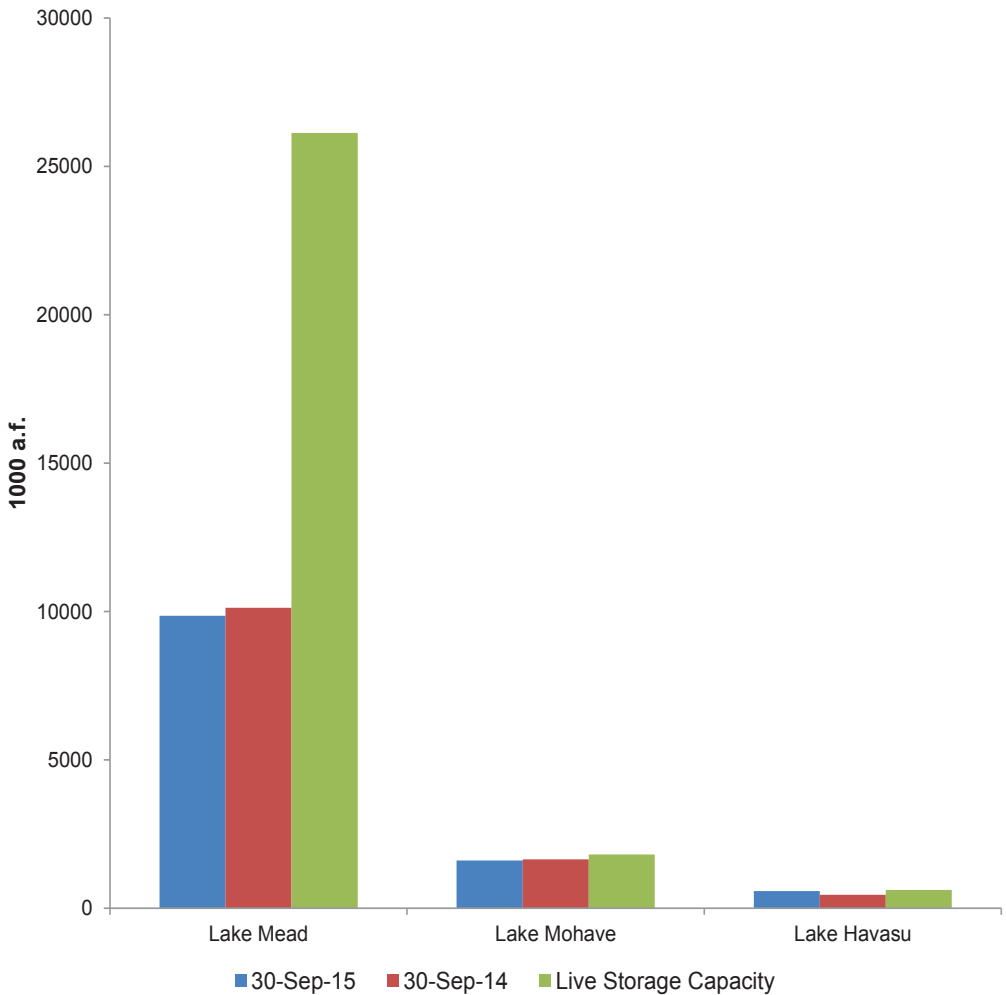
- Water Surface Elev (ft)
- Maximum Storage Elev = 7519.4 ft (Content = 940,700 af)
- Rated Head Elev = 7438 ft (Content = 360,627 af)
- Outflow (1000 cfs)



## Storage in Principle Reservoirs – End of Water Year 2015

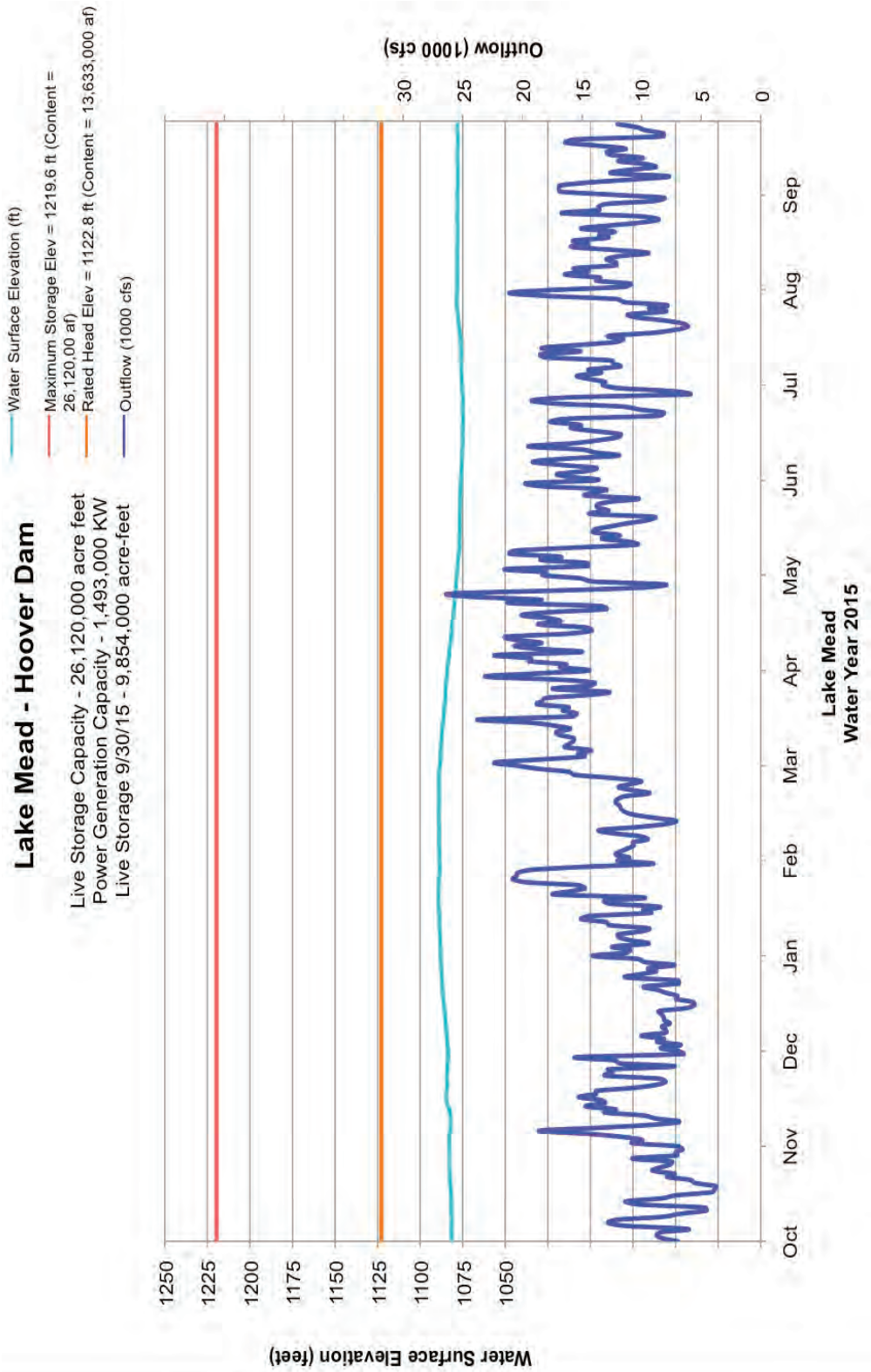
### Lower Basin Live Storage Contents

Reservoir	Sept 30, 2015 (acre-feet)	Percent Live Capacity	Sept 30, 2014 (acre-feet)	Percent Live Capacity	Change in Contents (acre-feet)
Lake Mead	9,854,000	37.7%	10,121,000	38.7%	(267,000)
Lake Mohave	1,605,800	88.8%	1,645,200	91.0%	(39,400)
Lake Havasu	580,700	93.8%	448,170	72.4%	132,530
Total	12,214,370	42.2%	14,536,000	42.8%	(173,870)



## Lake Mead - Hoover Dam

Live Storage Capacity - 26,120,000 acre feet  
Power Generation Capacity - 1,493,000 KW  
Live Storage 9/30/15 - 9,854,000 acre-feet



### 3. Flows of Colorado River

Table 3 on pages 24 and 25 shows the estimated virgin flow of the Colorado River at Lee Ferry, Arizona for each water year from 1896 through 2015. Column (4) of the table shows the average virgin flow for any given year within the period computed through Water Year 2015. Column (5) shows the average virgin flow for a given year within the period computed since Water Year 1896. Column (6) shows the average virgin flow for each progressive ten-year period beginning with the ten-year period ending on September 30, 1905. The difference between the virgin flow for a given year and the average flow over the 120-year period, 1896 through 2015 is shown in column (7)

Article III (d) of the Colorado River Compact stipulates that “the States of the Upper Division will not cause the flow of the river at Lee Ferry to be depleted below an aggregate of 75,000,000 acre-feet for any period of ten consecutive years reckoned in a continuing progressive series beginning with the first day of October next succeeding the ratification of this Compact.” Prior to the storage of water in the Colorado River Storage Project reservoirs, which began in 1962, the flow of the river at Lee Ferry in any ten consecutive years was greatly in excess of the 75,000,000 acre-feet required by the Compact. Beginning in 1962, Colorado River Storage Project reservoirs have regulated the river above Glen Canyon Dam. Table 4 on page 26, shows the historic flow at Lee Ferry for the period 1954 through 2015. The historic flow for each progressive ten-year period from 1954 through 2015, beginning with the ten-year period ending September 30, 1962, the commencement of storage in Colorado River Storage Project reservoirs, is shown in Column (3).

In each consecutive ten-year period, the total flow equaled or exceeded the 75,000,000 acre-feet required by the Compact. The flow at Lee Ferry during the ten-year period ending September 30, 2015 was 90,750,000 acre-feet. The graphs on pages 27 and 28 illustrate some of the pertinent historical facts related to the amounts of water produced by the Colorado River System above Lee Ferry, Arizona, the compact division point between the Upper and Lower Colorado River Basins. The first graph on page 27 is entitled Colorado River Flow at Lee Ferry, Arizona. The top of each vertical bar represents the estimated virgin flow of the river, i.e., the flow of the river in millions of acre-feet past Lee Ferry for a given year had it not been depleted by activities of man. Each vertical bar has two components: The lower shaded part represents the estimated or measured historic flow at Lee Ferry, and the difference between the two sections of the bar in any given year represents the stream depletion, or the amount of water estimated to have been removed by man from the virgin supply upstream from Lee Ferry. It is worth noting that in 1977, and again in 1981, the historic flow at Lee Ferry exceeded the virgin flow. Beginning in 1962, part of this depletion at Lee Ferry was caused by the retention and storage of water in storage units of the Colorado River Storage Project. The horizontal line (at approximately 14.6 million acre-feet) shows the long-term average virgin flow from 1896 through 2015. Because the Colorado River Compact is administered based on running averages covering periods of ten years, the progressive ten-year average historic and virgin flows are displayed on this graph.

The second graph on page 28, entitled Lee Ferry Average Annual Virgin Flow for Selected Periods, is a graphical representation of historic and virgin flow averages for several periods of record. The periods of water years selected were those to which reference is usually made for various purposes in documents pertaining to the Colorado River System.

Several important hydrologic facts are apparent from these two graphs on pages 27 and 28.

- (1) A vast majority of the high flows occurred prior to 1929.
- (2) Since the 1924-1933 decade, the progressive ten-year average virgin flow has not exceeded the average virgin flow except in the 1941-1950 and the exceptionally wet 1975-1984 through 1984-1993 decades.
- (3) For the period 1896-1921, which is prior to the Colorado River Compact of 1922, the average virgin flow was estimated to be 16.8 million acre-feet per year, which is considerably greater than for any other period selected, including the long-term average. A stream-gaging station at Lees Ferry, Arizona was not installed until 1921. Thus, the virgin flow at Lees Ferry prior to the 1922 Compact is estimated based upon records obtained at other stations, e.g. the stream gage on the Colorado River at Yuma, Arizona for the period 1902-1921.
- (4) For the longest period shown, 1896-2015, the estimated average annual virgin flow is 14.6 million acre-feet, and the average annual historic flow is 11.7 million acre-feet.
- (5) For the next longest period, 1906-2015, the estimated average annual virgin flow is 14.7 million acre-feet, and the average annual historic flow is 11.6 million acre-feet. Many of the early records for this series of years as well as for the 1896-2015 period are based upon the estimates of flows made at other gaging stations, as mentioned in (3) above. This average is about equal to the 15.0 million acre-feet estimated for the 1906-1967 period, which was used as the basis for justification of a water supply for the Central Arizona Project authorized in 1968.
- (6) The estimated average annual virgin flow during the 1914-2015 periods is 14.4 million acre-feet. This period is an extension of the 1914-1965 period used in the Upper Colorado Region Comprehensive Framework studies of 1971. The average annual virgin flow for the 1914-1965 periods is 14.6 million acre-feet.
- (7) The average annual virgin flow for the period 1914-1945 is 15.6 million acre-feet. This was the period of record used by the negotiators of the Upper Colorado River Basin Compact of 1948.
- (8) For the period 1922-2015, which is the period of record since the signing of the Colorado River Compact, the average annual virgin flow is 14.1 million acre-feet, and the average annual historic flow is 10.7 million acre-feet. Records for this series of years are based upon actual measurements of flows at Lees Ferry. The ten-year moving average flow since 1922 is considerably less than the ten-year moving average flow prior to 1922.
- (9) Two completely unrelated ten-year periods of minimum flows have occurred since 1930. During these periods, 1931-1940 and 1954-1963, the average annual virgin flow amounts to only 11.8 million acre-feet and 11.6 million acre-feet.
- (10) For a 12-year period, 1953-1964, the average annual virgin flow amounts to only 11.6 million acre-feet.

(11) Since Glen Canyon Dam's closure in 1963, the estimated virgin flow for the subsequent 50 years is 14.2 million acre-feet. The estimated historical flow for the same period (1964-2015) is 9.8 million acre-feet.

**4. Colorado River Salinity Program**

The Upper Colorado River Commission has continued its interest and involvement in the Colorado River Basin salinity problem. The Commission staff has worked with representatives of the Commission's member States, particularly the Colorado River Basin Salinity Control Forum, which is composed of representatives from the seven Colorado River Basin States. The Forum has developed water quality standards and a plan of implementation to meet the Environmental Protection Agency Regulation (40 CFR Part 120 Water Quality Standards-Colorado River System: Salinity Control Policy and Standards Procedures).

Section 303 of the Clean Water Act requires that water quality standards be reviewed from time to time and at least once during each three-year period. The Forum in 2011 reviewed the existing State-adopted and Environmental Protection Agency-approved numeric salinity criteria and found no reason to recommend changes for the three lower mainstem stations which are as follows:

The values are:

	<u>Salinity in (mg/l)</u>
Below Hoover Dam .....	723
Below Parker Dam .....	747
Imperial Dam.....	879

It then updated its plan of implementation. The Forum has now begun its 2014 Review process. For several years, the States, the Upper Colorado River Commission and the Forum have been working with Reclamation as it has updated its river model that can reproduce flows and salinity concentrations of the past and predict probabilities of flows and salinity concentrations in the future. This model is used as a tool in preparation of the reviews.

The Salinity Control Program has been successful in implementing controls that have reduced the average concentrations at Imperial Dam by 90-100/L. The salinity standards are based on long-term average flows, and the river model can assist with the analysis of future salinity control needs. The 2011 Review recognized measures in place which control about 1.2 million tons of salt annually and need to control about 650,000 additional tons by the year 2030. The Salinity Control Program is not designed to offset short-term variances caused by short-term hydrologic variances from the norm.



**Table 3**  
**ESTIMATED VIRGIN FLOW AT LEE FERRY**  
(million acre-feet)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Years to 2015	Year Ending Sept. 30	Estimated Virgin Flow	Average to 2015	Average Since 1896	Progressive 10-year Moving Average	Virgin Flow Minus 120-year Average
120	1896	10.1	14.6	10.1		-4.5
119	1897	18.0	14.7	14.1		3.4
118	1898	13.8	14.7	14.0		-0.8
117	1899	15.9	14.7	14.5		1.3
116	1900	13.2	14.7	14.2		-1.4
115	1901	13.6	14.7	14.1		-1.0
114	1902	9.4	14.7	13.4		-5.2
113	1903	14.8	14.7	13.6		0.2
112	1904	15.6	14.7	13.8		1.0
111	1905	16.0	14.7	14.0	14.0	1.4
110	1906	19.1	14.7	14.5	14.9	4.5
109	1907	23.4	14.7	15.2	15.5	8.8
108	1908	12.9	14.6	15.1	15.4	-1.7
107	1909	23.3	14.6	15.7	16.1	8.7
106	1910	14.2	14.5	15.6	16.2	-0.4
105	1911	16.0	14.5	15.6	16.5	1.4
104	1912	20.5	14.5	15.9	17.6	5.9
103	1913	14.5	14.4	15.8	17.6	-0.1
102	1914	21.2	14.4	16.1	18.1	6.6
101	1915	14.0	14.4	16.0	17.9	-0.6
100	1916	19.2	14.4	16.1	17.9	4.6
99	1917	24.0	14.3	16.5	18.0	9.4
98	1918	15.4	14.2	16.4	18.2	0.8
97	1919	12.5	14.2	16.3	17.2	-2.1
96	1920	22.0	14.2	16.5	17.9	7.4
95	1921	23.0	14.2	16.8	18.6	8.4
94	1922	18.3	14.1	16.8	18.4	3.7
93	1923	18.3	14.0	16.9	18.8	3.7
92	1924	14.2	14.0	16.8	18.1	-0.4
91	1925	13.0	14.0	16.6	18.0	-1.6
90	1926	15.9	14.0	16.6	17.7	1.3
89	1927	18.6	14.0	16.7	17.1	4.0
88	1928	17.3	13.9	16.7	17.3	2.7
87	1929	21.4	13.9	16.8	18.2	6.8
86	1930	14.9	13.8	16.8	17.5	0.3
85	1931	7.8	13.8	16.5	16.0	-6.8
84	1932	17.2	13.8	16.6	15.9	2.6
83	1933	11.4	13.8	16.4	15.2	-3.2
82	1934	5.6	13.8	16.1	14.3	-9.0
81	1935	11.6	13.9	16.0	14.2	-3.0
80	1936	13.8	14.0	16.0	14.0	-0.8
79	1937	13.7	14.0	15.9	13.5	-0.9
78	1938	17.5	14.0	16.0	13.5	2.9
77	1939	11.1	13.9	15.8	12.5	-3.5
76	1940	8.6	14.0	15.7	11.8	-6.0
75	1941	18.1	14.0	15.7	12.9	3.5
74	1942	19.1	14.0	15.8	13.1	4.5
73	1943	13.1	13.9	15.7	13.4	-1.5
72	1944	15.2	13.9	15.7	14.1	0.6
71	1945	13.4	13.9	15.7	14.4	0.6
70	1946	10.4	13.9	15.6	14.0	-1.2
69	1947	15.5	14.0	15.6	14.2	-4.2
68	1948	15.6	13.9	15.6	14.0	0.9
67	1949	16.4	13.9	15.6	14.5	1.8
66	1950	12.9	13.9	15.6	15.0	-1.7
65	1951	11.6	13.9	15.5	14.3	-3.0
64	1952	20.7	13.9	15.6	14.5	6.1
63	1953	10.6	13.8	15.5	14.2	-4.0
62	1954	7.7	13.9	15.4	13.5	-6.9
61	1955	9.2	14.0	15.3	13.1	-5.4
60	1956	10.7	14.0	15.2	13.1	-3.9
59	1957	20.1	14.1	15.3	13.6	5.5
58	1958	16.5	14.0	15.3	13.6	1.9



**Table 3**  
**ESTIMATED VIRGIN FLOW AT LEE FERRY**  
(million acre-feet)

p(1)	(2)	(3)	(4)	(5)	(6)	(7)
Years to 2011	Year Ending Sept. 30	Estimated Virgin Flow	Average to 2012	Average Since 1896	Progressive 10-year Moving Average	Virgin Flow Minus 114-year Average
57	1959	8.6	13.9	15.2	12.9	-6.0
56	1960	11.3	14.0	15.1	12.7	-3.3
55	1961	8.5	14.1	15.0	12.4	-6.1
54	1962	17.3	14.2	15.0	12.1	2.7
53	1963	8.4	14.1	15.0	11.8	-6.2
52	1964	10.2	14.2	14.9	12.1	-4.4
51	1965	18.9	14.3	14.9	13.1	4.3
50	1966	11.2	14.2	14.9	13.1	-3.4
49	1967	11.9	14.3	14.8	12.3	-2.7
48	1968	13.7	14.3	14.8	12.0	-0.9
47	1969	14.4	14.4	14.8	12.6	-0.2
46	1970	15.4	14.4	14.8	13.0	0.8
45	1971	15.1	14.3	14.8	13.7	0.5
44	1972	12.2	14.3	14.8	13.1	-2.4
43	1973	19.4	14.4	14.9	14.2	4.8
42	1974	13.3	14.3	14.8	14.6	-1.3
41	1975	16.6	14.3	14.9	14.3	2.0
40	1976	11.6	14.2	14.8	14.4	-3.0
39	1977	5.8	14.3	14.7	13.8	-8.8
38	1978	15.2	14.5	14.7	13.9	0.6
37	1979	17.9	14.5	14.8	14.3	3.3
36	1980	17.5	14.4	14.8	14.5	2.9
35	1981	8.2	14.3	14.7	13.8	-6.4
34	1982	16.2	14.5	14.7	14.2	1.6
33	1983	24.0	14.4	14.8	14.6	9.4
32	1984	24.5	14.1	14.9	15.8	9.9
31	1985	20.8	13.8	15.0	16.2	6.2
30	1986	21.9	13.6	15.1	17.2	7.3
29	1987	16.9	13.3	15.1	18.3	2.3
28	1988	11.5	13.1	15.1	17.9	-3.1
27	1989	9.4	13.2	15.0	17.1	-5.2
26	1990	8.6	13.4	14.9	16.2	-6.0
25	1991	12.3	13.5	14.9	16.6	-2.3
24	1992	11.0	13.6	14.9	16.1	-3.6
23	1993	18.5	13.7	14.9	15.5	3.9
22	1994	10.4	13.5	14.9	14.1	-4.2
21	1995	19.7	13.6	14.9	14.0	5.1
20	1996	13.8	13.3	14.9	13.2	-0.8
19	1997	21.0	13.3	15.0	13.6	6.4
18	1998	16.8	12.9	15.0	14.2	2.2
17	1999	16.1	12.7	15.0	14.8	1.5
16	2000	10.3	12.4	14.9	15.0	-4.3
15	2001	10.9	12.6	14.9	14.9	-3.7
14	2002	5.5	12.7	14.8	14.3	-9.1
13	2003	10.5	13.3	14.8	13.5	-4.1
12	2004	9.1	13.5	14.7	13.4	-5.5
11	2005	17.0	13.9	14.7	13.1	2.4
10	2006	13.1	13.6	14.7	13.0	-1.5
9	2007	12.5	13.6	14.7	12.2	-2.1
8	2008	16.4	13.8	14.7	12.1	1.8
7	2009	14.3	13.4	14.7	12.0	-0.3
6	2010	12.9	13.2	14.7	12.2	-1.7
5	2011	20.4	13.3	14.8	13.2	5.8
4	2012	8.1	11.5	14.7	13.4	-6.5
3	2013	9.1	12.7	14.6	13.3	-5.6
2	2014	14.8	14.5	14.7	13.9	0.1
1	2015	14.2	14.2	14.6	13.6	-0.4
<b>Maximum</b>		24.5			18.8	9.9
<b>Minimum</b>		5.5			11.8	-9.1
<b>Average</b>		14.6			14.7	0.0

**Table 4**  
**HISTORIC FLOW AT LEE FERRY**  
**1954-2015**

Water Year Ending Sept. 30	Historic Flow (1,000 a.f.)	Progressive 10- Year Total (1,000 a.f.)
1954	6,116	
1955	7,307	
1956	8,750	
1957	17,340	
1958	14,260	
1959	6,756	
1960	9,192	
1961	6,674	
1962	14,790	
1963	2,520	93,705
1964	2,427	90,016
1965	10,835	93,544
1966	7,870	92,664
1967	7,824	83,148
1968	8,358	77,246
1969	8,850	79,340
1970	8,688	78,836
1971	8,607	80,769
1972	9,330	75,309
1973	10,141	82,930
1974	8,277	88,780
1975	9,274	87,219
1976	8,494	87,843
1977	8,269	88,288
1978	8,369	88,299
1979	8,333	87,782
1980	10,950	90,044
1981	8,316	89,753
1982	8,323	88,746
1983	17,520	96,125
1984	20,518	108,366
1985	19,109	118,201
1986	16,866	126,573
1987	13,450	131,754
1988	8,160	131,545
1989	7,995	131,207
1990	8,125	128,382
1991	8,132	128,198
1992	8,023	127,898
1993	8,137	118,515
1994	8,306	106,303
1995	9,242	96,436
1996	11,530	91,100
1997	13,873	91,523
1998	13,441	96,804
1999	11,540	100,349
2000	9,530	101,754
2001	8,361	101,983
2002	8,348	102,308
2003	8,372	102,543
2004	8,348	102,585
2005	8,395	101,738
2006	8,508	98,716
2007	8,422	93,265
2008	9,180	89,004
2009	8,406	85,870
2010	8,436	84,777
2011	13,227	89,643
2012	9,534	90,829
2013	8,289	90,746
2014	7,590	89,988
2015	9,157	90,750

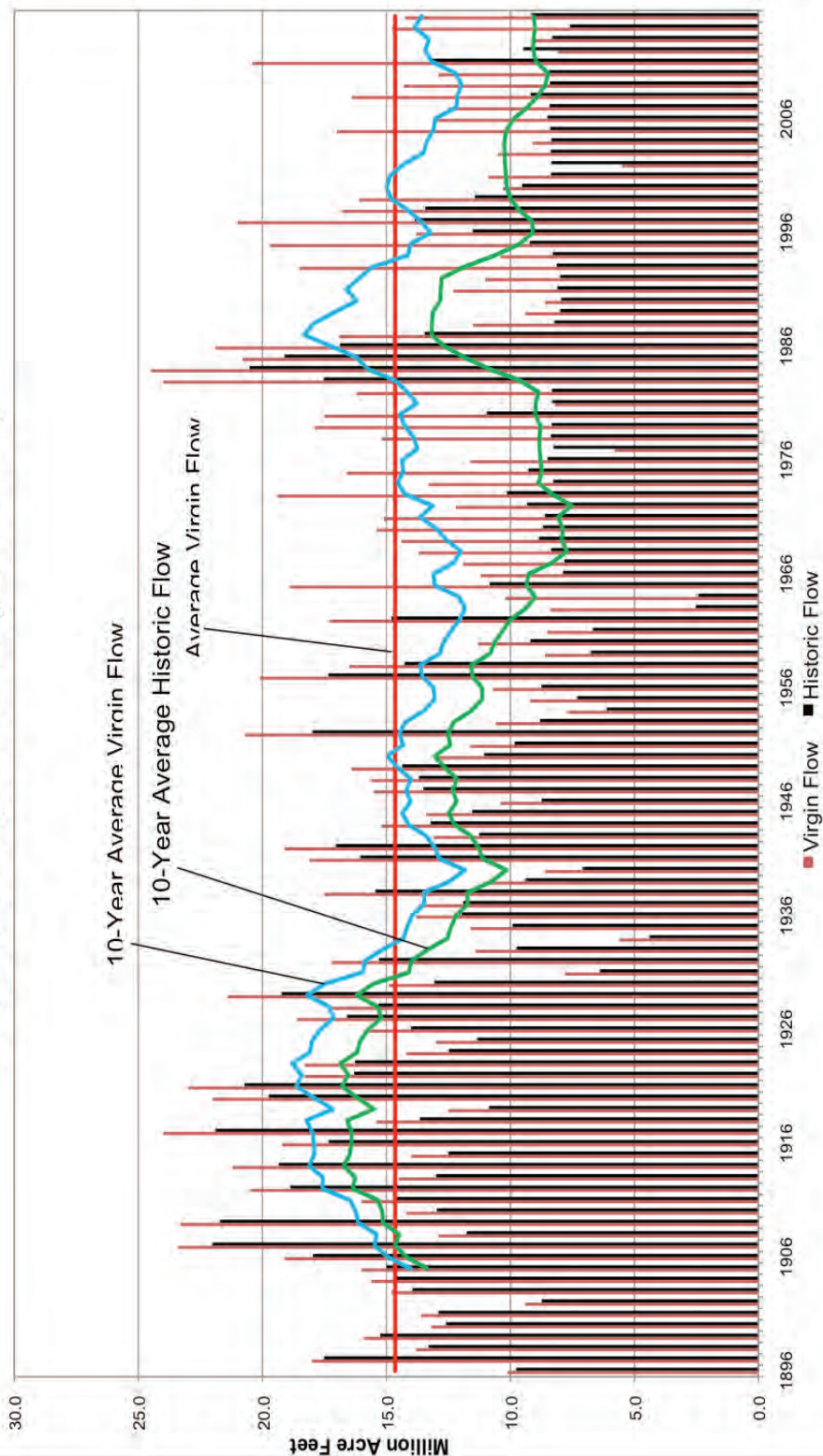
Storage in Flaming Gorge and Navajo Reservoirs began in 1962.

Storage in Glen Canyon Reservoir began in 1963.

Storage in Fontenelle reservoir began in 1964.

Based upon provisional streamflow records subject to revision.\*

# Colorado River Flow At Lee Ferry, Arizona (W.Y. 2015)



**Lee Ferry Average Annual Virgin Flow**  
For Selected Periods



## **B. LEGAL**

### **1. Water Newsletter**

The legal staff continues to inform the Commissioners, their advisers and other interested parties about developments in the courts, Congress and certain Federal agencies through the Water Newsletter. Current information can be found in the newsletter. In addition, the legal staff has prepared legal memoranda on matters needing more detailed treatment.

### **2. Legislation**

In the First Session of the 114<sup>th</sup> Congress, Congress enacted the following statute that is important to the Upper Colorado River Basin States:

Public Law 114-57, approved September 30, 2015, to make technical corrections to the Navajo water rights settlement in the State of New Mexico.

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# **COLORADO RIVER STORAGE PROJECT AND PARTICIPATING PROJECTS**

## **A. AUTHORIZED STORAGE UNITS**

*Information relative to storage units and participating projects has been provided by the United States Department of the Interior, Bureau of Reclamation.*

The guiding force behind development and management of water in the Upper Basin is the Colorado River Storage Project (CRSP). Authorized by the Colorado River Storage Project Act of 1956 (Public Law 485, 84<sup>th</sup> Congress, 70 Stat 105), the CRSP allows for the comprehensive development of water resources of the Upper Basin states by providing for long-term regulatory storage of water to meet the entitlements of the Lower Basin. The CRSP is one of the most complex and extensive river resource developments in the world and was integral to the development of the arid West.

Four storage units were authorized by the 1956 Act: the Glen Canyon Unit on the Colorado River in Arizona and Utah; the Flaming Gorge Unit on the Green River in Utah and Wyoming; the Navajo Unit on the San Juan River in Colorado and New Mexico; and the Wayne N. Aspinall Unit, formerly named the Curecanti Unit and rededicated in July 1981, on the Gunnison River in Colorado. The Aspinall Unit consists of Blue Mesa, Morrow Point, and Crystal dams and reservoirs. Combined, the four main storage units provide about 30.6 million acre-feet of live water storage capacity. The initial CRSP Act of 1956 also authorized the construction of 11 participating projects. Additional participating projects have been authorized by subsequent Congressional legislation.

Key benefits of the CRSP include regulating the flow of the Colorado River, storing water for beneficial consumptive use, providing for reclamation of arid and semi-arid lands, providing flood control, providing recreation, and generating clean and renewable hydroelectric power. Benefits are also provided for fish and wildlife needs and other environmental considerations per the Colorado River Basin Project Act of 1968, National Environmental Policy Act of 1969, Endangered Species Act of 1973, and Grand Canyon Protection Act of 1992.

The CRSP storage units and authorized participating projects are described in this 67<sup>th</sup> report and earlier annual reports of the Upper Colorado River Commission. Progress on construction along with updates on operation and maintenance, power generation, recreational use, planning investigation activities, reservoir operations, and appropriations of funds for the storage units and participating projects accomplished during the past water year (October 1, 2014, to September 30, 2015), fiscal year (October 1, 2014, to September 30, 2015), and calendar year (2015) are outlined below. Significant upcoming or projected information is also included for some storage units and projects.

### **1. Glen Canyon Unit**

Glen Canyon Dam and reservoir (Lake Powell) comprises the key storage unit of the CRSP and is the largest of the initial four, providing about 80 percent of the storage and generating capacity. Construction of the dam was completed in 1963. In addition to water storage for flood control and consumptive uses, Glen Canyon Dam was built as a hydroelectric peaking power facility, permitting it to move from low electrical output during low power demand to high electrical output in peak demand periods by adjusting water releases through the powerplant to respond to variances in electrical demand.

At optimum operations, the eight generators at Glen Canyon Dam are capable of producing 1,320 megawatts of power. Water is drawn into the power penstock intakes about 200-230 feet below the surface of Lake Powell at full pool, which results in clear cold water with year-round temperatures of 45 to 50 degrees F being released from Glen Canyon Dam. During protracted droughts, such as has occurred from 2000-2015, Lake Powell elevations decline to levels where warmer water is drawn through the penstocks and released downstream. The recreation, irrigation, and hydropower benefits introduced to the southwest by Glen Canyon Dam are extensive and continue to expand.

Since the damming of the river in 1963, there has been only one flow release that approached average pre-dam spring floods. In 1983, a combination of unanticipated hydrologic events in the Upper Colorado River Basin, combined with a lack of available storage space in Lake Powell, resulted in emergency releases from Glen Canyon Dam that reached 93,000 cubic feet per second (cfs). Except for the flood events of the mid-1980s, historic daily releases prior to the preparation of the final 1995 Glen Canyon Dam environmental impact statement (EIS) generally ranged between 1,000 cfs and 25,000 cfs, with flows averaging between 5,000 cfs and 20,000 cfs.

As a result of the construction and operation of Glen Canyon Dam, the Colorado River ecosystem below the dam has changed significantly from its pre-dam natural character. In addition, the dam's highly variable flow releases from 1964 to 1991 caused concern over resource degradation resulting from dam operations. Because of these concerns, the Secretary of the Interior (Secretary) adopted interim operating criteria in October 1991 that narrowed the range of daily powerplant fluctuations. Since the signing of the final operating criteria in February 1997, powerplant releases do not exceed 25,000 cfs, other than during occasional experimental flows or emergency situations, and have most often averaged between 10,000 cfs and 20,000 cfs. Experimental high flows have not exceeded 45,000 cfs.

Responding to concerns that changes to the Colorado River ecosystem were resulting from dam operations, Reclamation launched the Glen Canyon Environmental Studies program in 1982. The research program's first phase (1982-1988) focused on developing baseline resource assessments of physical and biotic resources. The second phase (1989-1996) introduced experimental dam releases and expanded research programs in native and non-native fishes, hydrology and aquatic habitats, terrestrial flora and fauna, cultural and ethnic resources, and social and economic impacts.

By the late 1980s, sufficient knowledge had been developed to raise concerns that downstream impacts were occurring, and that additional information needed to be developed to quantify the effects and to develop management actions that could avoid and/or mitigate the impacts. This collective information, and other factors, led to a July 1989 decision by the Secretary to direct Reclamation to prepare an EIS on the operation of Glen Canyon Dam. The intent was to evaluate alternative dam operation strategies to lessen the impacts of operations on downstream resources.

In October 1992, the President signed into law the Reclamation Projects Authorization and Adjustment Act, Public Law (P.L.) 102-575. Responding to continued concerns over potential impacts of Glen Canyon Dam operations on downstream resources, Congress included the Grand Canyon Protection Act (GCPA) as Title 18 of this Act. Section 1802(a) of the GCPA requires the Secretary to operate Glen Canyon Dam:

. . . in accordance with the additional criteria and operating plans specified in Section 1804 and exercise other authorities under existing law in such a manner as to protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established, including, but not limited to natural and cultural resources and visitor use.



The GCPA directs the Secretary to implement this section in a manner fully consistent with all existing laws that govern allocation, appropriation, development, and exportation of the waters of the Colorado River Basin.

Section 1804 of the GCPA required preparation of an EIS, adoption of operating criteria and plans, reports to Congress, and allocation of costs. The Operation of Glen Canyon Dam Final Environmental Impact Statement was filed with the Environmental Protection Agency in March 1995 and a Record of Decision (ROD) was signed in October 1996. The ROD changed two flow parameters from those shown in the preferred alternative of the EIS. They were (1) increasing the normal maximum flow from 20,000 cfs to 25,000 cfs and (2) increasing the upramp rate (the hourly rate of increase in releases to meet hydropower demands) from 2,500 cfs/hour to 4,000 cfs/hour. The ROD also changed the triggering mechanisms for conducting beach/habitat-building flows (experimental flows above powerplant capacity). Instead of conducting them in years when Lake Powell storage was low on January 1, they would be conducted in years when Lake Powell storage was high and reservoir releases in excess of powerplant capacity were required for dam safety purposes. Following the signing of the ROD, the Secretary adopted a formal set of operating criteria (February 1997) and the 1997 Annual Plan of Operations. This action terminated the 1991 interim operating criteria.

The signing of the 1996 ROD began a new chapter in the history of Glen Canyon Dam. In addition to meeting traditional water and power needs, the dam is now being operated in a more environmentally sensitive manner. The EIS process demonstrated the value of a cooperative, integrative approach to dealing with complex environmental issues. The inclusion of stakeholders resulted in a process that will serve to guide future operations of Glen Canyon Dam and become a template for other river systems.

### **a. Glen Canyon Dam Operations During 2015**

For detailed information on the operations of Glen Canyon Dam and reservoir, see the RESERVOIR OPERATIONS section of this report (Section H).

### **b. Adaptive Management**

The Glen Canyon Dam Adaptive Management Program (AMP) was implemented following the 1996 Record of Decision on the Operation of Glen Canyon Dam Final Environmental Impact Statement (FEIS) to comply with consultation requirements of the Grand Canyon Protection Act of 1992. It provides an organization and process to ensure the use of scientific information in decision making for Glen Canyon Dam operations and protection of downstream resources consistent with the GCPA. The AMP includes the Glen Canyon Dam Adaptive Management Work Group (AMWG), Secretary's Designee, Technical Work Group, U.S. Geological Survey's (USGS) Grand Canyon Monitoring and Research Center (GCMRC), and independent scientific review panels. Department of the Interior Regional Directors also facilitate communication and cooperation in the AMP. The program is primarily funded by hydropower revenues. A major initiative of the AMP is developing a set of desired future conditions for important resources within the Glen Canyon National Recreational Area and Grand Canyon National Park that will provide opportunities to balance the competing demands on dam operations. The AMWG makes recommendations to the Secretary of the Interior on dam operations and other management actions that will likely meet those objectives.

Adaptive management is founded in monitoring, research, and scientific experimentation. Long-term monitoring is used to track trends and compare current resource status with baseline conditions. Monitoring protocols are carefully established to ensure consistency and compatibility among data sets and to reveal when resource expectations are not met. Experiments are designed to better understand the ecological processes at work and

resource responses. They are resource-integrated and target the complex interactions among the numerous pieces of the resource puzzle. Currently, efforts are focused on improving the status of the endangered humpback chub and the conservation of fine sediments, most of which are now retained in Lake Powell and not delivered to Grand Canyon National Park. The endangered humpback chub population in Grand Canyon was in decline in the 1990s, and reached a low of about 5,000 adult fish in 2001, but has stabilized and increased since that time. The 2008 population estimate compiled by the USGS was about 7,650 adult fish and the most recent estimate (2014) is that the population size has grown to 11,000 fish. The exact cause of the population increase is unknown, but removal of non-native fish, endangered fish translocation efforts, experimental water releases, and recent drought-induced warmer dam releases likely have contributed.

A diverse group of 25 stakeholders comprises the AMP and each has a voice in formal recommendations. AMP stakeholders have divergent views on the interpretation of the GCPA, particularly with regard to how it may or may not amend previous statutes related to the operation of Glen Canyon Dam. While each stakeholder represents their own interests, they also work together for the common good of protecting the ecosystem downstream from Glen Canyon Dam and meeting provisions of the GCPA.

The AMP effort continues to make progress in forming partnerships among participants, understanding resource issues, and experimenting with dam operations and other management actions to better accomplish the intent of the FEIS Record of Decision and the GCPA. It is, of necessity, a long-term commitment.

### **c. Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead**

Against the backdrop of the worst drought in over a century on the Colorado River, and pursuant to a Secretarial directive to finish this effort by 2007, Reclamation worked through a National Environmental Policy Act process to develop interim operational guidelines for Lake Powell and Lake Mead to address drought and low reservoir conditions. These operational guidelines provide Colorado River water users and managers in the United States a greater degree of certainty about how the two large reservoirs on the Colorado River will be operated under low water conditions, and when – and by how much – water deliveries will be reduced in the Lower Basin to the states of Arizona, California, and Nevada in the event of drought or other low reservoir conditions. In a separate, cooperative process, Reclamation worked through the State Department to consult with Mexico regarding potential water delivery reductions to Mexico under the 1944 Treaty with the United States.

A Record of Decision was signed by the Secretary of the Interior at the Colorado River Water Users Association's Annual Conference in Las Vegas, Nevada, on December 13, 2007. The ROD implements the interim operational guidelines that will be in place through 2026. The key components of the guidelines are: (1) a shortage strategy for Lake Mead and the Lower Division states, (2) coordinated operations of Lakes Powell and Mead through a full-range of operations, (3) a mechanism for the creation and delivery of conserved system and non-system water in Lake Mead (Intentionally Created Surplus), and (4) the modification and extension of the existing Interim Surplus Guidelines.

### **d. Experimental Releases from Glen Canyon Dam**

Reclamation has been conducting experimental releases from Glen Canyon Dam to protect, mitigate adverse impacts to, and improve downstream environmental resources consistent with the Grand Canyon Protection Act of 1992. These experimental releases are coordinated through the Glen Canyon Dam Adaptive Management Program.

## **(i). High-Flow Experiments**

Pre-Protocol high-flow experiments were conducted in 1996, 2004, and 2008. Each experimental release added to the understanding of the river ecosystem below the dam and the impacts of high-flow releases. Long-term monitoring has revealed an ongoing loss of fine sediment in the Grand Canyon. Nearly 90 percent of the sediment that once entered the Grand Canyon is now deposited in Lake Powell. Scientific evaluation of the 1996 high-flow experiment revealed that (1) more sediment was exported than was conserved; (2) while beaches were built, the sediment was mined from the river channel and eddy complexes; and (3) a week-long high flow was not necessary to effectively build beaches. Scientific understanding gained from the 1996 experiment and subsequent geomorphic studies resulted in the hypothesis that conducting high-flow experiments following tributary inputs that produce sediment-enriched conditions can result in overall sediment conservation. Data collected from the 2008 high-flow experiment showed that considerable building of sandbars occurred; however, sandbars created are subsequently subject to erosion. The erosion rate varies greatly depending upon such factors as bar location and the subsequent flow regime, where higher flows and fluctuating flows result in greater erosion rates. High-flow releases also create backwater habitats along shorelines which are important for native fish. Sand deposits created or deepened from high-flow releases are hypothesized to protect archaeological sites as well through deposition of sand on those sites.

## **(ii). Steady-Flow Experiments**

Steady-flow experiments from Glen Canyon Dam have been conducted periodically since 2000. A five-year experiment with steady flows during September and October was initiated in 2008 and continued through 2012. The purpose of this experiment was to evaluate how steady flows influence juvenile native fish growth and survival, assess habitat use and movement of juvenile native fish in response to steady flows, and identify the source of juvenile native fish found in the mainstem. The Near Shore Ecology (NSE) project found that survival of juvenile humpback chub did not differ significantly between the fluctuating flows and the experimental steady flow treatments. The NSE project also documented that juvenile humpback chub were able to survive and rear in the mainstem Colorado River even at small sizes.

## **(iii). Environmental Compliance for Experimental Releases**

A final Environmental Assessment for Experimental Releases from Glen Canyon Dam, Arizona, 2008 through 2012, and Finding of No Significant Impact (FONSI) covering the 2008 high-flow experiment and five years of fall steady flows were issued on February 29, 2008. Continuing scientific studies and a synthesis report released by the USGS's GCMRC in February 2011 compared the 1996, 2004, and 2008 high-flow experiments and have served to assist the Glen Canyon Dam Adaptive Management Work Group in formulating recommendations on future experimental flows. In 2012, environmental compliance was completed for a new 10-year high-flow protocol as described below. The Department of the Interior remains committed to involving the AMWG and the public in the decision-making process for experimental releases at Glen Canyon Dam.

### **e. Environmental Assessment (EA) for an Experimental Protocol for High-Flow Releases from Glen Canyon Dam (Protocol)**

On December 10, 2009, the Secretary of the Interior announced that the Department of the Interior would undertake an important experimental initiative to improve the management of Glen Canyon Dam and the Colorado River as it flows through Grand Canyon National Park. The Secretary identified the initiative as the development of a High-Flow Experimental Protocol for conducting additional high-flow experiments at the dam, building on knowledge accrued during previous experiments.

National Environmental Policy Act compliance was initiated in December 2009, and following two periods of public comment on the draft EA, a final EA was published in December 2011. The EA analyzes the effects of implementing a Protocol to conduct multiple high-flow experiments from Glen Canyon Dam during the period 2011-2020. It also includes a biological opinion rendered by the U.S. Fish and Wildlife Service (Service) and a science plan written by the GCMRC to measure resources from high-flow experiments conducted under the Protocol. The primary purpose of the Protocol is to learn, through adaptive management, how to better conserve the limited sand supply to the Colorado River below Glen Canyon Dam, while also ensuring that no significant impacts occur to other resources affected by the high releases. The Department's effort to develop and implement the Protocol is a component of its efforts to comply with the requirements and obligations established by the Grand Canyon Protection Act of 1992.

In May 2012, the Department released a FONSI on the Protocol. Concurrent with that release, a Directive was issued by the Secretary to establish a Glen Canyon Leadership Team comprised of members from the five Department bureaus engaged in the AMP (Bureau of Reclamation, National Park Service [NPS], U.S. Fish and Wildlife Service, Bureau of Indian Affairs, and U.S. Geological Survey) and the Offices of the Assistant Secretaries for Water and Science and for Fish and Wildlife and Parks. The Leadership Team is tasked with making a decision on high-flow experiments under the Protocol based on input from a Technical Team having representation from the same bureaus and offices. The first high-flow release under the new Protocol was conducted in November 2012. The second and third high-flow experiments were conducted in November 2013 and 2014, respectively.

#### **f. Environmental Assessment for Non-Native Fish Control in the Colorado River Below Glen Canyon Dam**

Biological opinions for the Colorado River Interim Guidelines and operation of Glen Canyon Dam include control of non-native fishes, and more specifically, removal of non-native fishes to benefit endangered humpback chub. Consequently, the 2010/2011 Glen Canyon Dam Adaptive Management Program work plan contained provisions for one to two non-native fish removal trips to take place near the mouth of the Little Colorado River in each of the two years. The Pueblo of Zuni and other AMP tribes expressed concern over the proposed removal trips at the April 2009 Glen Canyon Dam Adaptive Management Work Group meeting. In June and July 2009, the Pueblo of Zuni wrote letters to Reclamation, the GCMRC, and the Service expressing concern over the killing of non-native fish and the location of the activity, which has cultural significance for the Zuni and other tribes. In order to resolve the conflict between the need to control non-native fish and address tribal concerns, Reclamation cancelled the planned 2010 removal trips, reinitiated Endangered Species Act (ESA) Section 7 consultation with the Service over cancellation of the trips, and began an effort to develop an EA to analyze potential alternatives to meet this need.

The Non-Native Fish Control EA evaluates possible actions that could reduce predation on endangered fish in the Colorado River below Glen Canyon Dam. Some means of control are necessary to satisfy commitments for biological opinions on the operation of Glen Canyon Dam to ensure compliance with the Endangered Species Act. Mechanical removal has been used for this purpose previously, but other methods were evaluated in the EA to address the concerns of some Native American tribes for what they perceive to be an unnecessary sacrifice of life in a sacred area.

Reclamation finalized the EA on December 30, 2011. Reclamation received a final biological opinion on the proposed action from the Service on December 23, 2011. In May 2012, concurrent with the FONSI on the Protocol, the Department released a FONSI on non-

native fish control below Glen Canyon Dam. Reclamation, the NPS, and the Service, with the assistance and cooperation of AMP members, are coordinating the non-native fish control program. Reclamation is committed to developing additional non-native fish control options and the NPS has developed a management plan for native and non-native fish downriver from Glen Canyon Dam. All of these actions are also being considered in the development of the Long-Term Experimental and Management Plan (LTEMP) EIS.

#### **g. Environmental Impact Statement for a Long-Term Experimental and Management Plan for Glen Canyon Dam**

On December 17, 2010, the Secretary of the Interior announced at the annual conference of the Colorado River Water Users Association the initiation of efforts to work with stakeholders on the development of a Long-Term Experimental and Management Plan for Glen Canyon Dam. A Notice of Intent was published in the *Federal Register* on July 6, 2011, that identified Reclamation and the NPS as co-leads in keeping with their respective authorities for dam operations and park management. Scoping was completed early in 2012.

The purpose of the proposed action in the EIS is to provide a comprehensive framework for adaptively managing Glen Canyon Dam over the next 20 years consistent with the GCPA and other provisions of applicable federal law. The proposed action will help determine specific dam operations and actions that could be implemented to improve conditions and continue to meet the GCPA's requirements and to minimize – consistent with law – adverse impacts on the downstream natural, recreational, and cultural resources in Glen Canyon National Recreation Area and Grand Canyon National Park, including resources of importance to American Indian Tribes.

The need for the proposed action stems from the need to use scientific information developed since the 1996 ROD to better inform the public of Department of the Interior decisions on dam operations and other management and experimental actions so that the Secretary of the Interior may continue to meet statutory responsibilities for protecting downstream resources for future generations, conserving Endangered Species Act-listed species, avoiding or mitigating impacts on National Register of Historic Properties-eligible properties, and protecting the interests of American Indian Tribes, while meeting obligations for water delivery and the generation of hydroelectric power.

The draft EIS assesses the potential environmental effects of seven alternatives being considered: the No-Action Alternative and six Action Alternatives. Reaction to the proposed LTEMP EIS by Glen Canyon Dam Adaptive Management Program members has been positive. Public reaction determined through the scoping process and subsequent outreach efforts was instrumental in assuring a full range of alternatives. An administrative draft EIS was distributed to the 15 cooperating agencies (including six tribes) on June 29, 2015; a 90-day review period expired on September 30, 2015.

The draft EIS was filed with the Environmental Protection Agency on January 8, 2016, and a Notice of Availability published in the *Federal Register* on that same day, initiating a 90-day public comment period ending April 7, 2016. Reclamation and the NPS will conduct two public meetings (Flagstaff and Phoenix, Arizona) and two public webinars during February-March 2016. Public meetings will include presentations by resource experts from Reclamation and the NPS and will provide a forum to solicit further comments from the public. The joint-lead agencies worked closely with stakeholders through the development of the draft EIS.

The Department of the Interior plans to issue a final EIS and ROD in fiscal year 2016.

#### **h. Lake Powell Pipeline Project**

The Utah State Legislature authorized the Lake Powell Pipeline Project in 2006 to meet the future water needs of a rapidly growing southwestern Utah. This proposed state project will deliver approximately 86,249 acre-feet of water per year from Lake Powell to two counties in Utah (~4,000 acre-feet to Kane County and ~82,249 acre-feet to Washington County) via a 139-mile pipeline. The water diverted into the pipeline will be a portion of Utah's Upper Colorado River Compact allocation and will consist of water rights to be held or acquired by two Utah water districts (one representing each county) and the Board of Water Resources. Energy generation components for the project include a potential 300-megawatt pumped storage component and 51 megawatts of conventional hydro generating capacity.

The Federal Energy Regulatory Commission (FERC) is the lead federal agency for the federal environmental compliance required for this State Project. Reclamation, the Bureau of Land Management, and the National Park Service are cooperating agencies. In March 2008, the State of Utah filed a Preliminary Application Document and Notice of Intent with FERC to begin the federal licensing, permitting, and environmental compliance processes for the project. While FERC will only license the hydropower portions, it will work with the other three federal agencies to prepare an environmental impact statement. The pre-application part of the process is expected to be finished in the winter of 2016. At that time, the license application will be filed and the EIS process will begin. The EIS process is expected to last through 2018.

The proposed project will require rights-of-way and other approvals from each federal agency. The project will also require the State to enter into a water service contract with Reclamation and a license agreement for the use of Reclamation lands for the proposed intake and pumping plant at Lake Powell.

The State supports this project as part of its state-wide water plan. The State will build the project and the two participating water districts will repay the costs through water sales.

#### **i. Drought Contingency Planning**

The Upper and Lower Colorado River Basin states were tasked by the Secretary of the Interior in June 2013 to develop drought contingency plans by December 2014. Since that time, states in the two basins have been working separately but in coordination with Reclamation to develop these plans. The Upper Basin Plan protects power generation at Glen Canyon Dam and provides limited protection against a Colorado River Compact call. The Upper Basin Plan includes three major components: (1) extended operations of CRSP reservoirs above Lake Powell to release water to Lake Powell during critically low periods; (2) voluntary demand management (e.g., reduction of diversion or consumptive use); and (3) augmentation (primarily weather modification and cloud seeding). A situation where Lake Powell would drop to critical power generation elevation and require implementation of the Upper Basin Plan is a low probability but would have significant impacts.

#### **j. Recreational Use**

The extensive use of the Glen Canyon National Recreation Area (NRA), which surrounds Lake Powell, is demonstrated by the annual visitation of 2,273,587 people as of October 30, 2015, the latest figure available. This increase from 2014 numbers is probably due to the recovering national economy and represents an increase of over 8 percent. The



National Park Service has concession-operated facilities at Wahweap, Dangling Rope, Halls Crossing, Hite, and Bullfrog Basin on the reservoir, and at Lees Ferry located 15.8 miles below Glen Canyon Dam on the Colorado River. The Navajo Nation operates a marina at Antelope Point where a successful Catch A Special Thrill (C.A.S.T.) fishing and boating event for children with disabilities was held on October 3, 2015.

Visitation at Rainbow Bridge as of September 30, 2015, was reported by the National Park Service to be 4,950 (latest figures available). This is a decrease of 91 percent from 2014. Reduced visitation is likely due to the low water level. At this time, Rainbow Bridge is not visible from the water surface and requires up to a two-mile hike to view it. In addition, the trail to the bridge was closed in March 2015 for a two-week period due to flood damage. This was after a month-long closure in January 2015 to perform trail fixes from flooding that occurred in September 2014. Rainbow Bridge is considered a sacred site by Native Americans and many go to the site to pray and hold religious ceremonies. The National Park Service has requested that visitors voluntarily respect the site and keep from approaching too closely or walking under the bridge. Personal watercraft use in the Rainbow Bridge area has been banned since 2000.

The Carl B. Hayden Visitor Center, adjacent to Glen Canyon Dam and powerplant in Page, Arizona, is owned and maintained by Reclamation and operated by the National Park Service. The Glen Canyon Natural History Association conducts public tours of the dam and operates the book sales area in the visitor center. Public guided tours will continue as long as the security threat advisory stays at “yellow” or below. Self-guided tours of the dam and powerplant were discontinued after September 11, 2001. As of January 5, 2009, a fee for guided tours is being charged to offset, in part, increased costs associated with public visitation to the visitor center. A \$1.5 million contract to upgrade the interpretive exhibits in the visitor center was awarded in May 2013 to Pacific Studio, Inc., of Seattle, Washington. Development of final text and photographs for the new exhibits is being done by the contractor and core interagency team. However, installation has been delayed due to extensive revisions made to the contractor’s initial submittals. Installation is now scheduled for the end of the 2016 summer season.

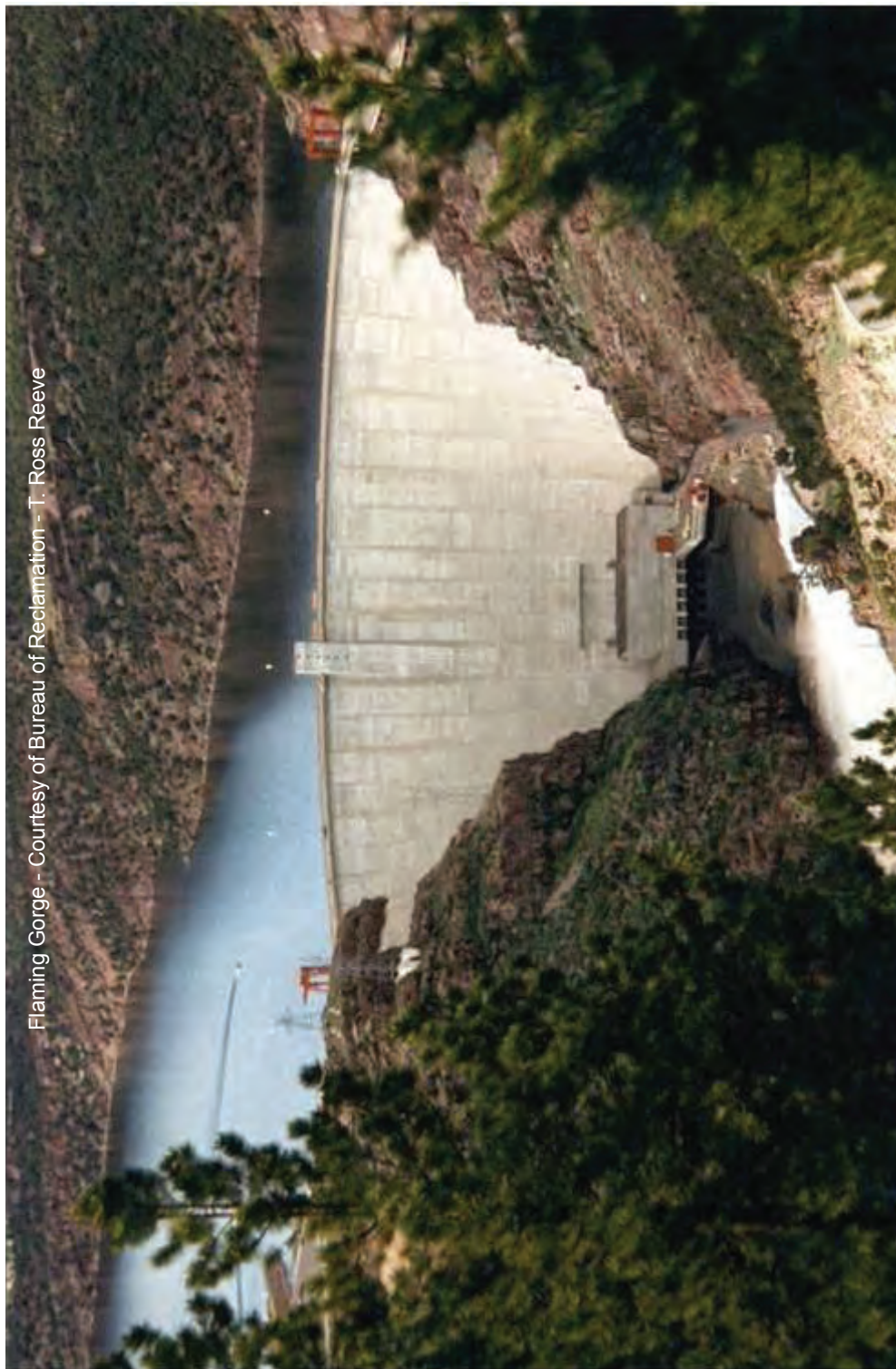
According to a peer-reviewed analysis and report published by economists from the U.S. Geological Survey and the National Park Service, 2014 tourism expenditures at both Glen Canyon and Rainbow Bridge generated \$155 million in direct local spending with a cumulative benefit of \$175 million for the local area. Tourism also supported 2,218 local jobs.

Glen Canyon NRA has a strong volunteer program and one of the activities is a year-long “Trash Tracker” program where volunteers clean up the lake shoreline. This year marked the 26<sup>th</sup> since this program was implemented. Volunteers went out 25 times in 2015, working a total of 2,640 hours to pick up 36,239 pounds of trash along 676 miles of shoreline. Items collected and properly disposed of included 22 mattresses, 3,210 aluminum cans, 3,727 plastic bottles, 983 golf balls, and 7,863 pieces of spent fireworks.

### **(i). Invasive Mussel Control**

Quagga Mussel DNA (deoxyribonucleic acid) has been detected in Lake Powell through sampling for several years and lower water levels have exposed shorelines that were previously inundated. Biologists from the Utah Division of Wildlife Resources discovered mussels colonized along some of the rocky shorelines in the lower part of lake that number in the thousands. Mussels were found as far south as Glen Canyon Dam in Arizona and as far north as Bullfrog marina in Utah. Biologists also found quagga mussels on canyon walls in the lower part of the lake. Lake Powell is now considered to be infested. Veligers (young mussels) are passing through the dam and small numbers of adult mussels have been found in the Glen Canyon stretch of the river.

Flaming Gorge - Courtesy of Bureau of Reclamation - T. Ross Reeve





In 2015, a substantial increase in the number of quagga mussels was observed. During a fixed wheel gate inspection, the number of attached quagga mussels was too large to effectively count. Additionally, small colonies of quagga mussels have been found within the plant piping systems. At this point in time the mussels have not adversely affected the operation of the powerplant and dam; however, they are expected to have negative impacts in the future. The Glen Canyon Field Division has chosen to mitigate the problem by installing new strainer baskets and micro-filtration on the plant piping systems. The Field Division has entered into a service agreement with the Denver Technical Service Center to develop a design and specification. It is hoped that installation will be complete by the end of 2017.

An Upper Colorado Region Invasive Mussel Response Plan has been developed. The program focuses on four areas: monitoring and sampling, engineering solutions, maintenance techniques, and operational practices. In addition, Reclamation has launched an extensive public outreach campaign to educate the public with radio and television spots as well as print advertisements in local tourism magazines. The National Park Service has also implemented mandatory boat inspections and continues to monitor park waters.

Although Lake Powell is extensively monitored and boat inspections are mandatory, the public bears the majority of the responsibility for preventing the spread of invasive species through cleaning, draining, and drying their boats. Boat inspections and decontamination only capture a small percentage of the boats entering the lake due to lack of staffing and other resources. Both Utah and Arizona state laws require boat owners to decontaminate their boats to avoid transporting mussels to other uninfested waters. Any boats entering the State of New Mexico from Lake Powell are required to be inspected and decontaminated before launching into any body of water in New Mexico.

## **2. Flaming Gorge Unit**

Flaming Gorge Dam and powerplant were completed in 1963. Upgrading of the units in 1992 increased the plant nameplate capacity from 108 megawatts to about 151 megawatts.

In September 2000, a final report entitled Flow and Temperature Recommendations for Endangered Fishes in the Green River Downstream of Flaming Gorge Dam was published by the Upper Colorado River Endangered Fish Recovery Program (Upper Colorado Recovery Program). The report, prepared by a multi-disciplinary team, synthesizes research conducted on endangered fish in the Green River under the Upper Colorado Recovery Program and presents flow recommendations for three reaches of the Green River. In 2006, Reclamation completed a National Environmental Policy Act process for implementation of an operation at Flaming Gorge Dam that meets the flow recommendations. A draft environmental impact statement was published in September 2004 and the Operation of Flaming Gorge Dam Final Environmental Impact Statement was published in November 2005. A Record of Decision was signed in February 2006. Flaming Gorge Dam is operated in accordance with the 2006 ROD and the September 2005 Biological Opinion on the Operation of Flaming Gorge Dam.

Fiscal year 2015 was the fifth year in which Reclamation worked with the Upper Colorado Recovery Program to implement the Larval Trigger Study Plan, which involves timing spring peak flows to entrain larval razorback sucker in floodplain wetlands. Reclamation is working with the Recovery Program in evaluating the flow and temperature recommendations for the effectiveness in recovery of endangered fish and a report is expected toward the end of 2016 or beginning of 2017.

### **a. Flaming Gorge Dam Operations During 2015**

For detailed information on the operations of Flaming Gorge Dam and reservoir, see the RESERVOIR OPERATIONS section of this report (Section H).

## **b. Recreational Use**

The interagency agreement between the Bureau of Reclamation and Ashley National Forest (U.S. Forest Service) for joint management of facilities within the primary jurisdiction area expired December 31, 2013, and the U.S. Forest Service declined to enter into another agreement. Operation of the visitor center is now Reclamation's sole responsibility. Reclamation has contracted with the Intermountain Natural History Association to staff the center and is negotiating a Memorandum of Understanding with the U.S. Forest Service on various roles and responsibilities.

Public tours of the dam are conducted March 15 through October 15 of each year through a contract with Choice Services, Inc. Tours of the inside of the dam are conducted when the security threat advisory is low. When the security threat advisory is high, tours of the inside of the dam are suspended and tourists are taken to a dam overlook area where guides present information about construction and operation of the dam.

The Flaming Gorge National Recreation Area, located in the states of Utah and Wyoming, is administered by the Ashley National Forest. A visitation estimate for the entire Ashley National Forest was compiled in fiscal year 2012 and resulted in a use figure of 654,000 for that year. The U.S. Forest Service does not estimate visitor use statistics by feature, so no estimated figures are available for the Flaming Gorge NRA.

Due to budget restraints, low visitation, and high maintenance, the U.S. Forest Service is currently planning the closure of 12 recreation sites on the east side of the forest from Sweetwater County, Wyoming, to Uintah County, Utah. Ten of the sites are within the boundaries of the Flaming Gorge NRA and include the Upper Marsh Creek boat ramp; Lucerne Group campground; Antelope Flat, Sheep Creek Bay, Red Canyon, Greendale, Skull Creek, and Red Springs campgrounds, and the Navajo Cliffs picnic area. The Ashley National Forest issued a legal notice and public scoping document in February 2015, conducted public meetings throughout March, and a final decision is expected in January 2016 with implementation to begin shortly thereafter.

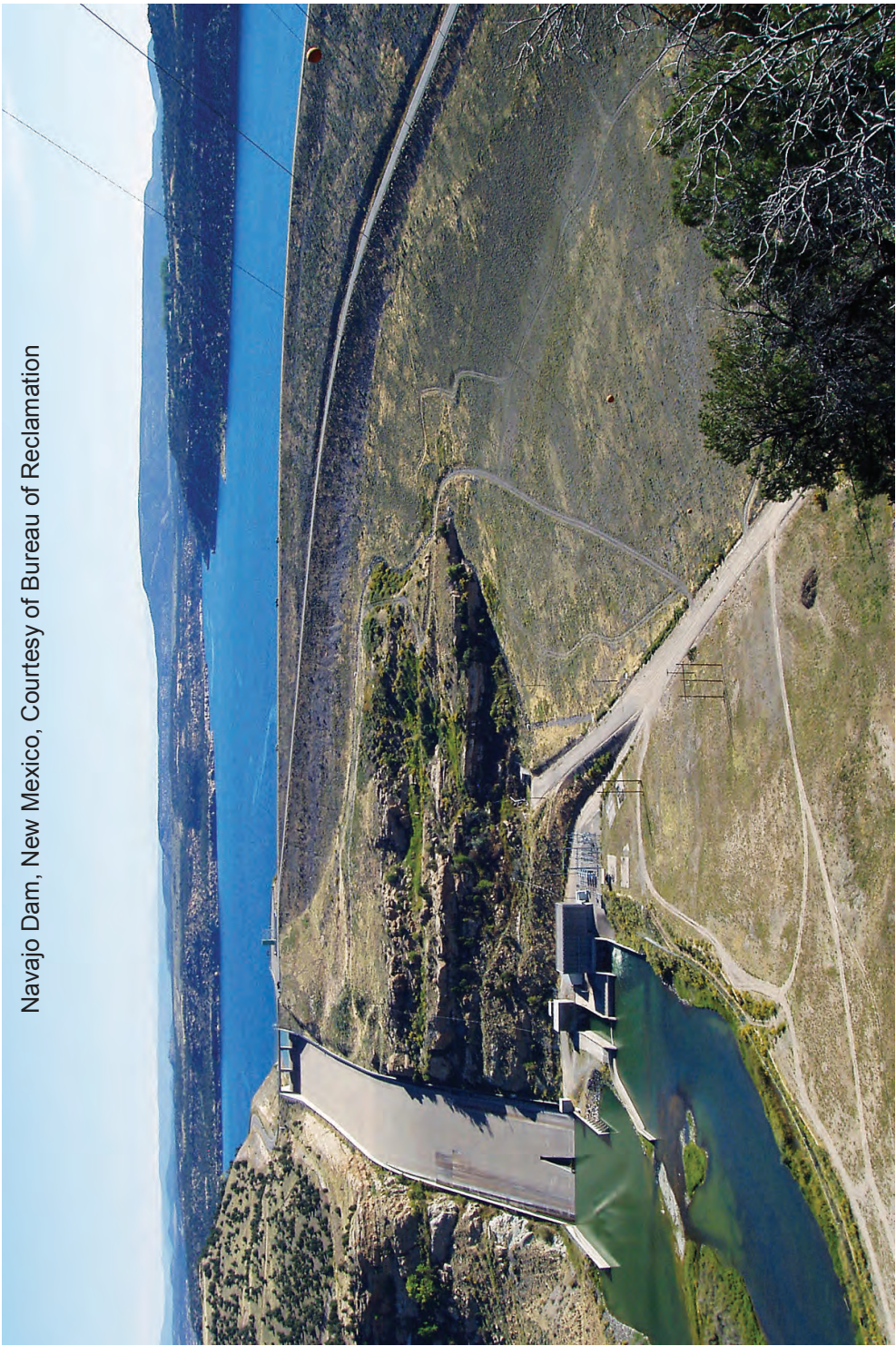
### **(i). Invasive Mussel Control**

Invasive mussel control at Flaming Gorge Reservoir is the responsibility of the states of Utah and Wyoming as well as marina owners and visitors. The Bureau of Reclamation periodically performs plankton towing and sends the samples to its labs in Denver where a couple of different tests are completed in an effort to discover the presence of veliger (larvae). The Utah Division of Wildlife Resources reports that DNA has been picked up at Flaming Gorge during sampling at least once, but the lake is not considered to be infested at this time. Continued monitoring in 2015 shows that the reservoir is free of invasive mussels.

## **3. Navajo Unit**

Navajo Dam was completed in 1963. The water stored behind Navajo Dam pursuant to the Colorado River Storage Project Act provides a water supply for the Navajo Indian Irrigation Project near Farmington, New Mexico, and the Hammond participating project. In addition, water for the Jicarilla Apache Nation is also available in Navajo Reservoir pursuant to the December 8, 1992, contract between the Jicarilla Apache Nation and the United States which was executed as part of the Jicarilla Apache Nation Water Rights Settlement Act of January 3, 1992 (P.L. 102-441). The water supply for the Navajo-Gallup Water Supply Project will also be provided in part by Navajo Reservoir, as was provided in the Omnibus Public Land Management Act of March 30, 2009 (P.L. 111-11).

Navajo Dam, New Mexico, Courtesy of Bureau of Reclamation





Reclamation published the Navajo Reservoir Operations Final Environmental Impact Statement on April 20, 2006, and the Record of Decision was signed on July 31, 2006. Reclamation's decision was to implement the preferred alternative that is identified in the 2006 ROD with reservoir releases ranging from 250 to 5,000 cfs. The preferred alternative, to the extent possible, implements criteria needed to assist in meeting flow recommendations for the endangered fish in the San Juan River, while assisting both current and future water development in the San Juan River Basin to proceed in compliance with the Endangered Species Act and other state and federal laws. Navajo Dam is operated in accordance with the 2006 Record of Decision.

#### **a. Navajo Dam Operations During 2015**

For detailed information on the operations of Navajo Dam and reservoir, see the RESERVOIR OPERATIONS section of this report (Section H).

#### **b. Recreational Use**

Recreation at Navajo Reservoir is under the jurisdiction of the states of Colorado and New Mexico through contracts with Reclamation. The Colorado portion of the reservoir, or Navajo State Park, is managed by the Colorado Division of Parks and Wildlife (CDPW). The New Mexico portion of the reservoir, or Navajo Lake State Park, is managed by the New Mexico State Parks Division (New Mexico State Parks). New Mexico State Parks will be returning a large portion of the lands around Navajo Reservoir back to Reclamation for management once the new statewide recreation lease agreement is signed (expected in 2016). New Mexico State Parks wants to reduce its footprint and responsibility in developed areas due to reduced resources. They will, however, continue boating patrols for enforcement of boating laws outside their formal boundary.

Visitation for Navajo Reservoir was reported to be 241,475 on the Colorado side from July 1, 2013, through June 30, 2014, and 531,630 on the New Mexico side during the state's fiscal year of July 1, 2014, through June 30, 2015.

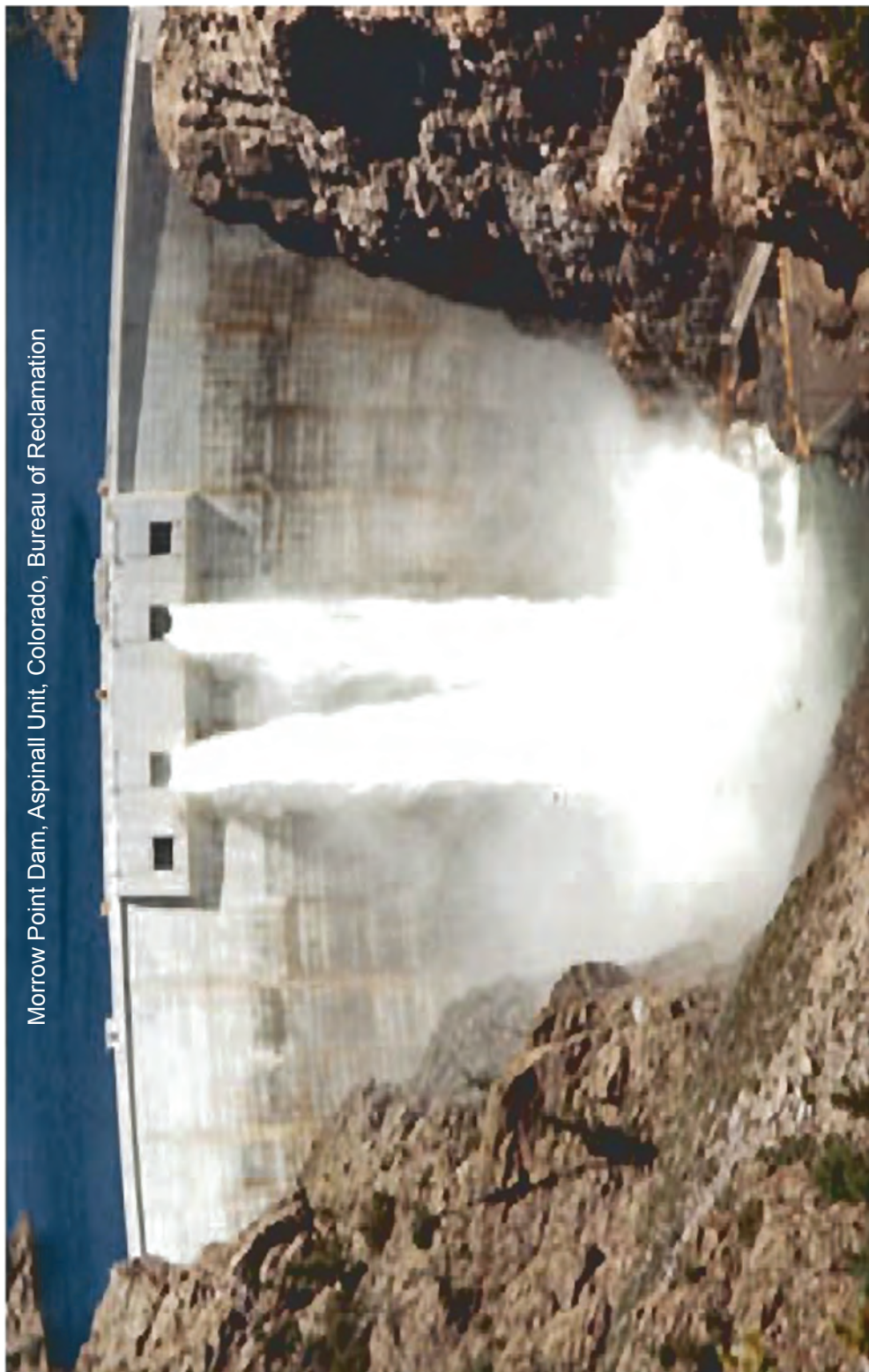
##### **(i). Invasive Mussel Control**

Reclamation is working with both recreation managing entities to develop effective solutions to manage the spread of invasive mussels including educating the public and providing materials such as signs and brochures. The CDPW is conducting boat inspections and has a portable boat wash and decontamination unit at Arboles. Due to funding limitations, staffing reductions, and liability issues, New Mexico State Parks will no longer perform boat inspections/decontaminations for invasive mussels at any of the reservoirs they manage for Reclamation. The New Mexico Department of Game and Fish (NMDGF) has authority under state law for mussel control and the agency started an inspection and decontamination program in 2013. To date, mussel testing results have been negative. Reclamation is working with New Mexico State Parks and the NMDGF for design and construction of boat inspection and decontamination facilities at Navajo Lake State Park. Construction is expected to begin in the fall of 2016. Reclamation is also working on a fee-for-service private sector contract to assist the NMDGF with boat inspection and decontamination services at Navajo Reservoir.

#### **4. Wayne N. Aspinall Unit**

The Wayne N. Aspinall Unit (Aspinall Unit) includes Blue Mesa, Morrow Point, and Crystal dams, reservoirs, and powerplants. Construction of the three Aspinall Unit dams was completed in 1976. The Aspinall Unit is located in Gunnison and Montrose counties,

Morrow Point Dam, Aspinall Unit, Colorado, Bureau of Reclamation



Colorado, on the Gunnison River upstream from Black Canyon of the Gunnison National Park. At optimum operations, the generators at Blue Mesa, Morrow Point, and Crystal powerplants are capable of producing a total of 283 megawatts of power.

Similar to Glen Canyon, Flaming Gorge, and Navajo dams, the Aspinall Unit is being evaluated to determine how operations can be modified to assist in the recovery of downstream endangered fish. Flow recommendations for endangered fish in the Gunnison River were completed in 2003. Reclamation prepared a draft EIS on Aspinall Unit operations to provide an operational pattern to assist in the conservation of endangered fish while continuing to meet Aspinall Unit purposes. The draft EIS was published in February 2009. The Aspinall Unit Operations Final Environmental Impact Statement was published in February 2012. The preferred alternative provides operational guidance for the Aspinall Unit for specific downstream spring peak and duration flows that are dependent on forecasted inflow to the Aspinall Unit reservoirs. It also provides base flows outside of the spring runoff period. The U.S. Fish and Wildlife Service completed a programmatic biological opinion for the EIS which addresses proposed operation changes as well as coverage of existing water uses in the Gunnison Basin. The biological opinion also completes Endangered Species Act compliance for the Dallas Creek and Dolores projects. The Record of Decision was issued in May 2012.

On January 8, 2009, the Colorado Water Court issued a decree quantifying the 1933 federal reserved water right for the Gunnison River through Black Canyon of the Gunnison National Park. The decree quantifies the March 2, 1933, priority date water right as a year-round minimum flow and variable peak and “shoulder” flows for each year, the magnitude of which are dependent upon current Gunnison River Basin hydrologic conditions. The negotiations for the right were discussed in the Aspinall Unit draft EIS. Now that the right is in place, additional detail is included in the final EIS. Reclamation will operate the Aspinall Unit with the intent of meeting the water right, the flow recommendations, and authorized Aspinall Unit purposes every year. The reserved right will be considered equally along with flow recommendations and authorized purposes of the Aspinall Unit. Because the reserved right is now decreed, it is considered to be a common element in the No Action and action alternatives cited in the final EIS.

#### **a. Aspinall Unit Operations During 2015**

For detailed information on the operations of Aspinall Unit dams and reservoirs, see the RESERVOIR OPERATIONS section of this report (Section H).

#### **b. Recreational Use**

Recreation use for the Aspinall Unit is managed by the National Park Service as the Curecanti National Recreation Area. Visitation to the NRA from October 1, 2014, through September 30, 2015 was reported to be 951,601. Visitation to the Black Canyon of the Gunnison located below Crystal Dam and adjacent to the Curecanti NRA was reported to be 204,356 for this same time period.

In 1965, the National Park Service entered into an agreement with the Bureau of Reclamation to construct and manage recreational facilities and to manage natural and cultural resources and recreation on, and adjacent to, the three reservoirs. This area became known as the Curecanti National Recreation Area. The NRA is currently identified by an administrative boundary that has not been established by legislation. Draft legislation has been written and may be introduced in 2016 by Senator Michael Bennet (D-CO). has been written and may be introduced in 2016 by Senator Michael Bennet (D-CO).

## **(i). Invasive Mussel Control**

The State of Colorado has instituted an aggressive program to prevent the spread of quagga and zebra mussels into its waters. The three Aspinall Unit reservoirs are being treated under the state's containment protocol for watercraft inspection procedures which requires watercraft exiting the water to be inspected (this is in addition to inspections required upon arrival). Any boats found to be suspicious will be decontaminated. All motorized watercraft leaving the Curecanti NRA will undergo a second inspection to ensure that the craft has been cleaned, drained, and dried according to Colorado's protocol. Continued monitoring has resulted in a couple of positive tests for veligers; however, these tests have not been backed up by microscopy and no adult mussels have been found.

## **B. STORAGE UNITS FISHERY INFORMATION**

The Glen Canyon, Flaming Gorge, Navajo, and Wayne N. Aspinall storage units continue to provide excellent warm- and cold-water fishing both in the reservoirs and in the tailwater streams below the dams.

Lake Powell is almost exclusively a warm-water fishery with bluegill, striped bass, crappie, walleye, channel catfish, and smallmouth and largemouth bass as the harvested species. Lake Powell is consistently a high-quality fishery, even during lower water elevations. It is unknown at this time how the presence of invasive mussels will impact the fishery at Lake Powell, although if impacts from other lakes where they are present is any indication, the fishery may fall off over the next few years, with less fish and less robust game species available. Mussels remove phytoplankton from the water column causing disruptions to the food web, and their waste products alter the ecosystem.

The cool, clear depths of Flaming Gorge Reservoir are ideal for several species of trout. These famous angling waters have produced fish of state and world record size including lake trout (mackinaw) over 50 pounds, German brown trout over 30 pounds, and rainbow trout over 25 pounds. Flaming Gorge also supports numerous cutthroat trout, kokanee salmon, smallmouth bass, and channel catfish. Due to illegal stocking, the reservoir also has an established population of burbot. Because the burbot is a voracious predator, its presence could seriously affect populations of sport fish in the reservoir. The Utah Division of Wildlife Resources requires any burbot caught to be killed and there is no limit on the number of fish that can be taken from either the Utah or Wyoming sides of the reservoir. Every year since 2012, the agency, in addition to many local businesses and fishing organizations, has sponsored a "Burbot Bash" which draws anglers from surrounding states and results in the removal of thousands of these invasive predatory fish. In addition to lessening the pressure on trout species, biologists are able to collect valuable information that will assist them in understanding and managing the population.

Navajo Reservoir provides both cold- and warm-water fisheries including catfish, crappie, and smallmouth bass in the shallows and near the lake surface. Kokanee salmon, northern pike, and many varieties of trout are found in the deeper, colder waters. Annually, during the late fall and early winter months, there is a snagging season for kokanee after the spawn and before the fish die.

The Aspinall Unit reservoirs are exclusively cold-water fisheries with six species of sports fish available: rainbow, mackinaw, brown, lake, and brook trout, as well as kokanee salmon. At one time, the Aspinall Unit reservoirs boasted the largest kokanee salmon fishery in the United States. However, due to an increasing lake trout population and predation of kokanee, the current population has fallen to about one third of what it was a decade ago. Blue Mesa Reservoir is being stocked with 3.5 million kokanee annually and anglers



are encouraged to keep the lake trout they take, with no limit on the number of lake trout measuring less than 38 inches in length. Angler reports from Blue Mesa indicate that lake trout in excess of 25 pounds are regularly taken and in 2007, a state record lake trout weighing 50 pounds was caught. A 2004 study estimates the economic impact of fishing at Blue Mesa at \$8 million for Gunnison County, the majority of this being generated from kokanee fishing. In addition, the harvesting of kokanee eggs from Blue Mesa supplies about 60 percent of the fingerlings stocked in waters throughout the State of Colorado.

The four tailwaters (the Colorado River below Glen Canyon Dam, the Green River below Flaming Gorge Dam, the San Juan River below Navajo Dam, and the Gunnison River below Crystal Dam) have provided excellent trout fishing that many view as some of the best in the western United States. The Flaming Gorge tailwater is designated a “blue ribbon” fishery by the Utah Division of Wildlife Resources and fish populations in the river have been counted as high as 22,000 per river mile; the highest concentration in the West. The seven miles between the dam and Little Hole accommodate approximately 80 percent of the estimated 150,000 anglers who fish the Green River every year. The 26 miles of the Gunnison River below Crystal through the Black Canyon are designated a “gold medal” fishery by the Colorado Division of Parks and Wildlife.

With the discovery of invasive adult mussels in the Colorado River below Glen Canyon Dam, it is unknown at this time how they might affect the fishery there. Another invasive, the green sunfish, was discovered in the summer of 2015 about four miles below Glen Canyon Dam. Due to concerns for endangered native fish species, rotenone was placed in the backwater where the sunfish were found. An impermeable barrier was installed between the backwater and the main river channel to keep the chemical localized and a chemical that neutralizes rotenone was placed in the water downstream of the treatment area. The backwater received two treatments of rotenone during the fall of 2015.

### **C. TRANSMISSION DIVISION**

The CRSP is one of Reclamation’s key hydropower producing projects. The CRSP’s combined installed capacity is over 1,800 megawatts with Glen Canyon Dam accounting for 1,320 megawatts alone. On average, the CRSP generates 5.6 billion kilowatt-hours per year, which accounts for about 15 percent of Reclamation’s total annual production of approximately 40 billion kilowatt-hours. The CRSP provides power to nearly six million people living in Arizona, Colorado, Nebraska, Nevada, New Mexico, Utah, and Wyoming.

The CRSP power system includes high voltage transmission lines that interconnect to the Colorado River Storage Project hydro-powerplants and delivers power to major load centers or other delivery points. The system is interconnected with adjacent federal, public, and private utility transmission systems. The Transmission Division was transferred to the Department of Energy, Western Area Power Administration (Western), in fiscal year 1978, who markets and delivers the hydroelectric power.

During fiscal year 2014, generation at CRSP powerplants amounted to 4.16 billion kilowatt-hours. The major portion, 3.12 billion kilowatt-hours, was produced at Glen Canyon Dam. The balance was produced at Flaming Gorge, Blue Mesa, Morrow Point, Crystal, Fontenelle, McPhee, and Towaoc powerplants.

Table 5 lists the gross generation for fiscal years 2014 and 2015 and the percentage of change:

**Table 5**  
**Gross Generation (Kilowatt-Hours)**  
**and Percentage of Change for**  
**Fiscal Years 2014 and 2015**

Powerplant	Fiscal Year 2014	Fiscal Year 2015	Percent Change
Glen Canyon	3,119,859,000	3,875,392,000	+24.2
Flaming Gorge	361,789,000	506,722,000	+40.1
Blue Mesa	199,332,000	244,497,000	+22.7
Morrow Point	269,793,000	324,020,000	+20.1
Crystal	123,761,000	156,947,000	+26.8
Fontenelle	59,014,000	75,924,000	+28.7
McPhee	2,902,000	5,017,000	+72.9
Towaoc	18,189,000	16,300,000	-10.4
<b>Total</b>	<b>4,154,639,000</b>	<b>5,204,819,000</b>	<b>+25.3</b>

#### **D. AUTHORIZED PARTICIPATING PROJECTS**

Twenty-two participating projects were *originally* authorized by Congress between 1956 and 1968. Eleven were authorized by the initial authorizing Act of April 11, 1956 (70 Stat. 105), one was authorized in the 1956 Act by terms of its authorizing Act of June 28, 1949 (63 Stat. 277), two were authorized by the Act of June 13, 1962 (76 Stat. 96), three were authorized by the Act of September 2, 1964 (78 Stat. 852), and five were authorized by the Act of September 30, 1968 (82 Stat. 886). Of the 22 originally authorized participating projects, ten are in Colorado, two in New Mexico, two in Utah, three in Wyoming, three in both Colorado and New Mexico, one in both Colorado and Wyoming, and one in both Utah and Wyoming. In the 1968 Act, the Pine River Extension Project was deleted, leaving 21 participating projects authorized by Congress. On March 30, 2009, the Omnibus Public Land Management Act (123 Stat. 991) amended the Colorado River Storage Project Act of 1956 to include the Navajo-Gallup Water Supply Project in New Mexico as a participating project, increasing the number to 22 participating projects *currently* authorized by Congress.

Participating projects develop, or would develop, water in the Upper Colorado River system for irrigation, municipal and industrial uses, and other purposes, and participate in the use of revenues from the Upper Colorado River Basin Fund to help repay the costs of irrigation features that are beyond the ability of the water users to repay. The Basin Fund is provided revenues from hydropower and water service sales.

To date, 17 of the currently authorized 22 participating projects have either been completed or are in the process of completion. The five remaining participating projects were deemed infeasible or economically unjustified and were never constructed.

A list of the 23 participating projects that have been authorized by Congress is shown below:

The 11 participating projects originally authorized in 1956 are:

1. Central Utah (Initial Phase), Utah,
2. Emery County, Utah,
3. Florida, Colorado,
4. Hammond, New Mexico,
5. La Barge, Wyoming,
6. Lyman, Utah and Wyoming,
7. Paonia, Colorado (works additional to existing project),
8. Pine River Extension, Colorado and New Mexico,
9. Seedskaadee, Wyoming,
10. Silt, Colorado, and
11. Smith Fork, Colorado.
12. In the 1956 Act, the Eden Project in Wyoming, by terms of its authorizing Act of June 28, 1949, became financially related to the Colorado River Storage Project as a participating project.

In 1962, authorizing legislation named the following two as participating projects:

13. Navajo Indian Irrigation, New Mexico (being constructed for the Bureau of Indian Affairs by the Bureau of Reclamation), and
14. San Juan-Chama, Colorado and New Mexico.

In 1964, authorizing legislation named an additional three as participating projects:

15. Bostwick Park, Colorado,
16. Fruitland Mesa, Colorado, and
17. Savery-Pot Hook, Colorado and Wyoming.

The Colorado River Basin Project Act of September 30, 1968, authorized five additional projects as participating projects, but deleted the Pine River Extension Project as a participating project:

18. Animas-La Plata, Colorado and New Mexico,
19. Dallas Creek, Colorado,
20. Dolores, Colorado,
21. San Miguel, Colorado, and
22. West Divide, Colorado.

The Omnibus Public Land Management Act of 2009 amended the Colorado River Storage Project Act of 1956 to include the following as a participating project:

23. Navajo-Gallup Water Supply, New Mexico.

Table 6 shows the 17 participating projects that have been completed or are in the process of completion:

**Table 6**  
**CRSP Participating Projects**  
**Completed or in the Process of Completion**

#	Project	State(s)	Dam	Year Completed
1.	Eden	Wyoming	Big Sandy	1952
---	Eden	Wyoming	Eden	1959
2.	Central Utah (Vernal Unit)	Utah	Steinaker	1962
3.	Hammond	New Mexico	---	1962
4.	Paonia	Colorado	Paonia	1962
5.	Smith Fork	Colorado	Crawford	1962
6.	Florida	Colorado	Lemon	1963
7.	Emery County	Utah	Joes Valley	1966
8.	Silt	Colorado	Rifle Gap	1966
9.	Seedskaadee	Wyoming	Fontenelle	1968
---	*Central Utah (Bonneville Unit)	Utah	Starvation	1970
10.	Bostwick Park	Colorado	Silver Jack	1971
11.	Lyman	Utah and Wyoming	Meeks Cabin	1971
12.	San Juan-Chama	Colorado and New Mexico	Heron	1971
---	*Central Utah (Bonneville Unit)	Utah	Soldier Creek	1973
---	*Central Utah (Bonneville Unit)	Utah	Currant Creek	1975
---	Lyman	Utah and Wyoming	Stateline	1979
---	*Central Utah (Jensen Unit)	Utah	Red Fleet	1980
---	*Central Utah (Bonneville Unit)	Utah	Upper Stillwater	1987
13.	Dallas Creek	Colorado	Ridgway	1991
---	*Central Utah (Bonneville Unit)	Utah	Jordanelle	1993
14.	Dolores	Colorado	McPhee	1998
---	*Central Utah (Uintah Basin Replacement Project)	Utah	Big Sand Wash (enlarged)	2006
15.	*Animas-La Plata	Colorado and New Mexico	Ridges Basin	2011
16.	*Navajo Indian Irrigation	New Mexico	---	---
17.	*Navajo-Gallup Water Supply	New Mexico	---	---

\*In the process of completion.

The present status of construction, investigation, and recreational facilities for the 23 authorized CRSP participating projects is as follows:

## **1. Colorado**

### **a. Bostwick Park Project**

The Bostwick Park Project is located in west-central Colorado near the city of Montrose. The project develops flows of Cimarron Creek, a tributary of the Gunnison River, for irrigation and for benefits to sport fishing and recreation. A full and supplemental supply of irrigation water is available for 6,100 acres of land. Silver Jack Dam (completed in 1971) is located on Cimarron Creek about 20 miles above the junction with the Gunnison River. Project water stored in Silver Jack Reservoir is released to Cimarron Creek. The releases, along with usable natural flows, are diverted from the creek into the existing Cimarron Canal 2.5 miles below the dam and conveyed 23 miles to the vicinity of the project land. The U.S. Forest Service developed recreation facilities under a cooperative arrangement with Reclamation. Facilities include access roads, campgrounds (60 units in three loops), two group areas, picnicking facilities, restrooms, a boat dock, trails, fences, landscaping, and an administration site. At 8,900 feet in elevation, use is seasonal. The reservoir is managed as a non-motorized boating lake with three species of trout. Access for anglers is fairly easy at designated access points around the 250-acre lake.

### **b. Dallas Creek Project**

The Dallas Creek Project is located on the Uncompahgre River in west-central Colorado. The area served by the project comprises most of the Uncompahgre River Basin and includes lands in Montrose, Delta, and Ouray counties. Ridgway Dam and reservoir, the primary features of the project, are located on the Uncompahgre River a few miles north of the town of Ridgway.

Block notice number one was issued for the Dallas Creek Project on May 31, 1989, covering all municipal and industrial water use. The notice involved 28,100 acre-feet of water. Repayment on that notice began in 1990. Block notice number two was issued on March 21, 1990. The notice included all irrigation waters for the project, involving 11,200 acre-feet. The notice was issued to Tri-County Water Conservancy District. The first payment under the repayment contract was made in February 1993 and will continue until February 2042.

On June 2, 2010, Reclamation issued a *Federal Register* Notice to accept proposals, select a lessee, and contract for hydroelectric power development at Ridgway Dam under a lease of power privilege.<sup>6</sup> Reclamation received one proposal, from Tri-County Water Conservancy District (Tri-County). On March 10, 2011, Reclamation made the selection of Tri-County as a potential lessee and executed a cost-recovery memorandum of understanding and contributed funds agreement. National Environmental Policy Act compliance for the proposed hydroelectric power development was completed in December 2011 and a 40-year lease between Tri-County and the United States was signed on February 6, 2012. Construction of the hydropower facility began in December 2012 and was completed in early

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<sup>6</sup> A lease of power privilege is an alternative to federal hydroelectric power development. It is a contractual right given to a non-federal entity to use a Reclamation facility for electric power generation consistent with Reclamation project purposes. Leases of power privilege have terms not to exceed 40 years. The general authority for lease of power privilege under Reclamation law includes, among others, the Town Sites and Power Development Act of 1906 (43 U.S.C. Sec. 522) and the Reclamation Project Act of 1939 (43 U.S.C. Sec. 485h(c)).

2014; operation of the powerplant began on April 3, 2014. The hydropower facility has a capacity of 7 megawatts and generates approximately 22,000 megawatt-hours per year.

Recreation at Ridgway Reservoir is managed by the Colorado Division of Parks and Wildlife under an agreement with Reclamation. Boating, scuba diving, water skiing, windsurfing, mountain biking, hiking, and swimming are some of the offerings at the park. The CDPW has assumed responsibility for marina operations and has recently made significant boat-related facility improvements. In addition, there are numerous picnicking and campsites available including miles of trails around the reservoir and downstream of Ridgway Dam. The existing trail system was recently lengthened by five miles; the new section of trail is located on the east side of Highway 550. Three miles of the new system compliment an adjacent Bureau of Land Management trail project, which resulted in 20 miles of new trails in the area. Reclamation and Ridgway State Park have implemented a seasonal closure of the area east of Highway 550 to public access to protect wintering big game.

Reclamation is working closely with CDPW to develop effective solutions to manage the spread of invasive mussels including educating the public and providing materials such as signs and brochures. The CDPW is conducting mandatory boat inspections at Ridgway and boat ramps are closed to trailered boats at the end of September of each year. Reclamation and CDPW are in the process of designing a permanent boat inspection and decontamination area at the reservoir with construction expected to begin in the fall of 2016.

### **c. Dolores Project**

The Dolores Project, located in the Dolores and San Juan River basins in southwestern Colorado, uses water from the Dolores River for irrigation, municipal and industrial use, recreation, fish and wildlife, and production of hydroelectric power. Primary storage of Dolores River flows for all project purposes is provided by McPhee Reservoir, formed by McPhee Dam and Great Cut Dike. Dolores Project construction began in 1976. By fiscal year 1995, all primary project facilities were completed and in operation. In 1996, Reclamation signed petitions allocating the last approximately 1,800 acre-feet of full-service irrigation water to full-service users. Reclamation substantially completed construction of the Dolores Project in fiscal year 1998. The final cost allocation for the project was completed in October 2000 and approved by the Upper Colorado Regional Director by memorandum dated January 25, 2001.

In order to mitigate construction of salinity control modifications to the Upper Hermana, Lone Pine, and Rocky Ford Laterals (parts of the Dolores Project), 55 acres of new wetlands were developed at the Lone Dome wetlands area below McPhee Dam. In order to complete the remaining 20 acres of mitigation, Reclamation developed Simon Draw wetlands near the Totten Reservoir area. A long-term management agreement between Reclamation and the Colorado Division of Parks and Wildlife for operation and maintenance of the Lone Dome wetlands area is in place. Reclamation's Western Colorado Area Office operates and maintains Simon Draw wetlands.

Hydroelectric power generation is a component of the Dolores Project with McPhee and Towaoc Canal powerplants. McPhee Powerplant is located at the downstream toe of McPhee Dam along the left abutment with an installed capacity of 1.3 megawatts. Towaoc Canal Powerplant is located on the Towaoc Canal, five miles north of Cortez, Colorado, in Montezuma County with an installed capacity of 11.5 megawatts.

Recreation at McPhee Reservoir is under the jurisdiction of the U.S. Forest Service through an agreement with Reclamation, and through legislation that expanded the boundary of the San Juan National Forest to include the reservoir. The reservoir has 50 miles of shoreline and two recreation complexes with campgrounds, day-use areas, and boat launch

ramps. There is also a marina concession to serve visitors. Montezuma County is exploring the potential for legislation to transfer title of the recreation areas at McPhee Reservoir to the county.

The Lone Dome Recreation Area is located below McPhee Dam and includes 12 miles of public access to the Dolores River. This area is comprised of lands administered by the U.S. Forest Service, Bureau of Land Management, and Colorado Division of Parks and Wildlife.

Reclamation is working with its recreation managing entities to develop effective solutions to manage the spread of invasive mussels. In 2009, Reclamation conducted a mussel facility risk assessment at McPhee Reservoir and the reservoir has been identified as being at high risk for infestation.

#### **d. Florida Project**

Lemon Dam is the principal feature of the Florida Project. The dam, completed in 1963, is located in southwestern Colorado on the Florida River, approximately 14 miles northeast of the city of Durango in La Plata County. Flows in the Florida River are stored in the reservoir formed by the dam, and regulated releases can provide supplemental irrigation water for 19,450 acres. In addition to the construction of Lemon Dam, Reclamation work included rebuilding the Florida Farmers Diversion Dam, enlarging 3.9 miles of the Florida Farmers Ditch to its junction with the Florida Canal, enlarging 1.8 miles of the Florida Canal, and building a new lateral system to serve about 3,360 acres of land on the southwest portion of Florida Mesa. Project funds were advanced to the Florida Water Conservancy District to rehabilitate, enlarge, and extend portions of the Florida Farmers Ditch and Florida Canal distribution systems that serve remaining lands on Florida Mesa. The 1,190 acres of project land located in the Florida River Valley will continue to be served by numerous small ditches without the expenditure of project funds.

Lemon Powerplant, completed in 1989, has a capacity of 0.12 megawatts. The powerplant was constructed and is operated by the Florida Water Conservancy District under a lease of power privilege contract.

A conversion contract for 2,500 acre-feet of Florida Project water to be available for municipal and industrial purposes was negotiated and is expected to be executed in early 2014. A similar contract for 114 acre-feet was executed in 2009, which made water originally tied to the land inundated by the reservoir available for augmentation purposes.

Lemon Reservoir provides important recreation and fish and wildlife benefits; however, its primary purpose is to provide irrigation water and flood control. Recreation at Lemon Reservoir is under the jurisdiction of the U.S. Forest Service through an agreement with Reclamation. This is a high-elevation reservoir (8,500 feet) with seasonal use. The Miller Creek Campground has 12 campsites, restrooms, potable water, boat launch ramp and parking area, and a day-use picnic area. The Upper Lemon Day-Use Area provides access for fishing and hiking and includes restrooms and a parking area.

Reclamation is working closely with the U.S. Forest Service to develop effective solutions to manage the spread of invasive mussels including educating the public and providing materials such as signs and brochures. In addition, Reclamation is working with the U.S. Forest Service and Florida Water Conservancy District for design and construction of boat inspection and decontamination facilities at the reservoir. Construction is expected to begin in the fall of 2016.



#### **e. Fruitland Mesa Project**

The Fruitland Mesa Project was found to be infeasible and was not constructed.

#### **f. Paonia Project**

The Paonia Project, located in west-central Colorado, provides full and supplemental irrigation water supplies for 15,300 acres of land in the vicinity of Paonia and Hotchkiss. Project construction includes Paonia Dam and reservoir and enlargement and extension of Fire Mountain Canal. Paonia Dam controls and regulates the runoff of Muddy Creek, a tributary of the North Fork of the Gunnison River.

Recreation at Paonia Reservoir is managed by the Colorado Division of Parks and Wildlife under an agreement with Reclamation. The original recreation facilities were built in 1963 and CDPW assumed management in 1965. There are two campgrounds (13 sites), a picnic area, and boat launching facilities. Recreational attractions at Paonia Reservoir include the landscape surrounding the park, waterskiing, and camping. The park's abundance of wildflowers makes it a destination for photographers and native plant hobbyists. The geology of the area includes fossilized palm fronds, willow, and elm leaves which can be seen in some of the boulders in the area. Paonia Reservoir is also known for northern pike fishing (best from late June through late August).

Reclamation is working closely with CDPW to develop effective solutions to manage the spread of invasive mussels including educating the public and providing materials such as signs and brochures. The CDPW is currently conducting boat inspections.

#### **g. San Miguel Project**

The San Miguel Project was found to be economically unjustified and was not constructed.

#### **h. Silt Project**

The Silt Project is located in west-central Colorado near the towns of Rifle and Silt. The project stores the flows of Rifle Creek and pumps water from the Colorado River to supply irrigation water for approximately 7,000 acres of land. Principal features of the project are Rifle Gap Dam and reservoir, a pumping plant, and a lateral system.

Recreation at Rifle Gap Reservoir is managed by the Colorado Division of Parks and Wildlife under an agreement with Reclamation. Recreation facilities include numerous campgrounds, picnic sites, a boat ramp, group use area, restrooms, and parking areas. Recreation activities include motorized water sports, swimming, sailing, windsurfing, and fishing. Although Rifle Gap is a small reservoir (350 surface acres), it is a popular one with five camp loops and 89 campsites; several campsites are accessible to persons with disabilities. Reservations are taken for the campsites from May 1 to October 31 of each year and the campgrounds remain open year round. Anglers take rainbow and German brown trout, walleye, pike, smallmouth and largemouth bass, and yellow perch from the reservoir's waters. Recreation facilities have been upgraded and expanded through a joint recreation rehabilitation program undertaken by CDPW and Reclamation. The remaining work was completed in 2014.

Reclamation is working closely with CDPW to develop effective solutions to manage the spread of invasive mussels including educating the public and providing materials such as signs and brochures. The CDPW is currently conducting boat inspections.

## **i. Smith Fork Project**

The Smith Fork Project, located about 30 miles southeast of Delta, Colorado, supplements the irrigation water supply for approximately 8,200 acres in Delta and Montrose counties and provides a full water supply for 1,423 acres of land previously not irrigated. Constructed features of the project include Crawford Dam and reservoir, Smith Fork Diversion Dam, Smith Fork Feeder Canal, Aspen Canal, Clipper Canal, and recreation facilities. Recreation at Crawford Reservoir is managed by the Colorado Division of Parks and Wildlife under an agreement with Reclamation. Boating, scuba diving, water skiing, jet skiing, windsurfing, swimming, fishing, and camping are some of the offerings at the park. There are two campgrounds with 66 sites, a group day-use area, and 30 sites for day use. Several years ago, the facilities were expanded and rehabilitated under the Rehabilitation Recreation Program. Several campsites are accessible to persons with disabilities.

Reclamation is working closely with CDPW to develop effective solutions to manage the spread of invasive mussels including educating the public and providing materials such as signs and brochures. The CDPW is currently conducting boat inspections.

## **j. West Divide Project**

The West Divide Project was found to be economically unjustified and was not constructed.

# **2. New Mexico**

## **a. Hammond Project**

The Hammond Project is located in northwestern New Mexico along the southern bank of the San Juan River and opposite the towns of Blanco, Bloomfield, and Farmington, New Mexico. The project provides an irrigation supply for 3,933 acres. Major project works consist of the Hammond Diversion Dam on the San Juan River (completed in 1962), the Main Gravity Canal, a hydraulic-turbine-driven pumping plant and an auxiliary pumping plant, three major laterals, minor distribution laterals, and the drainage system. Most of the irrigation supply is obtained from direct diversions of the natural streamflow of the San Juan River. When necessary, these flows are supplemented by storage releases from Navajo Reservoir, a major feature of the CRSP. Water is diverted from the river by the Hammond Diversion Dam and turned into the 27.4-mile-long Main Canal. Major diversions from the canal are made by the East and West Highline laterals, which are served by the Hammond Pumping Plant, and the Gravity Extension lateral. Small diversions are made by minor laterals.

## **b. Navajo-Gallup Water Supply Project**

The Navajo-Gallup Water Supply Project was authorized for construction by the Omnibus Public Land Management Act of 2009 (P.L. 111-11) and is the cornerstone of the Navajo Nation water rights settlement in the San Juan River Basin in New Mexico. The legislation identified prerequisites for construction that included completion of an environmental impact statement and Record of Decision, execution of a Water Rights Settlement Agreement and Settlement Contract with the Navajo Nation, execution of repayment contracts with project beneficiaries, and execution of a cost-share agreement with the State of New Mexico. In addition, Section 10401 of the 2009 Act amended the Colorado River Storage Project Act of 1956 to include the Navajo-Gallup Water Supply Project as a participating project and to allow the Secretary of the Interior to create and operate a top water bank within the available capacity of Navajo Reservoir. Section 10602(e) of the 2009 Act directed the Secretary of the Interior to reserve, from existing reservations of Colorado River Storage Project power

for Reclamation projects, up to 26 megawatts of power for use by the Navajo-Gallup Water Supply Project. The Act also set the appropriations ceiling for the project at \$870 million (2007 price level), adjustable for inflation.

By the spring of 2012, all legislated construction prerequisite documents were completed and the first construction contract was awarded on April 16, 2012. A groundbreaking ceremony featuring the Secretary of the Interior and other federal, tribal, and local dignitaries was held on June 2, 2012.

The Navajo-Gallup Water Supply Project will consist of two water treatment plants, 280 miles of pipeline, numerous pumping plants, and water regulation and storage facilities. The project will convey a reliable municipal and industrial water supply to the eastern section of the Navajo Nation; the southwestern part of the Jicarilla Apache Nation; and the City of Gallup, New Mexico, via diversions from the San Juan River in northern New Mexico. Navajo Nation communities and the City of Gallup rely on a rapidly depleting groundwater supply that is inadequate to meet present needs and anticipated growth. Other water sources are needed to meet the current and future municipal and industrial demands of more than 43 Navajo chapters including the communities of Fort Defiance and Window Rock in Arizona, the City of Gallup, and the Teepee Junction area of the Jicarilla Apache Nation. Based on expected populations in the year 2040, the project would serve approximately 203,000 people in the Navajo Nation, 1,300 people in the Jicarilla Apache Nation, and approximately 47,000 people in the City of Gallup.

In 2011, the Navajo-Gallup Water Supply Project was identified as one of 14 projects nationwide that will be expedited through permitting and environmental review processes as described in a Presidential Memorandum dated August 31, 2011. The project will still comply with all environmental compliance and permitting requirements, but will be streamlined. Design and construction work will be carried out by Reclamation as well as the Navajo Nation, the City of Gallup, and the Indian Health Service. The Claims Resolution Act of 2010 contains a provision for Navajo-Gallup Water Supply Project funding from the Reclamation Water Settlements Fund in the amount of \$180 million over three years starting with \$60 million in fiscal year 2012.

Construction of the project is well underway. In 2015, Reclamation continued construction on the first pumping plant of the project (Tohlakai Pumping Plant) and awarded a construction contract on Reach 22A of the Cutter Lateral. In addition, the City of Gallup continued construction on Reach 13 and the Navajo Nation continued construction on Reaches 24.1 and 25. Both of these contracts are being completed under financial assistance agreements between Reclamation and both entities. Also in 2015, Reclamation and the Western Area Power Administration entered into an interagency agreement for brining power to the project. Reclamation and Western will work collaboratively with the Navajo Tribal Utility Authority and other local power providers to ensure necessary facilities are in place to serve electrical power to the project. In 2016, Reclamation anticipates awarding additional contracts, including a design-build contract for the Cutter Water Treatment Plan. Construction of the project is scheduled to be completed in 2024.

### **c. Navajo Indian Irrigation Project**

The Navajo Indian Irrigation Project (NIIP) was authorized in 1962 by P.L. 87-483 to develop the necessary infrastructure to deliver San Juan River water to approximately 110,630 acres of farmland in the northeastern part of the Navajo Reservation near Farmington, New Mexico. In a 1962 Memorandum of Agreement (MOA) which defined the roles and

responsibilities of the Bureau of Indian Affairs (BIA) and Reclamation, Reclamation was designated to design, construct, and initially operate and maintain the project. The 1962 MOA required that construction funding for the project be sought by the BIA in its budget appropriation.

The project has been under construction for over 51 years and is now only approximately 70 percent complete with many of the project features now requiring rehabilitation. The primary issue affecting NIIP completion is insufficient construction funding which has been inconsistent throughout the history of the project and has ranged from a peak of \$28.555 million in 1967 to \$0 in 1984 and 1986. The present funding levels are minimally sufficient to cover costs associated with the operation and maintenance of facilities still remaining in construction status. Insufficient funding adversely impacts Reclamation's ability to maintain adequate staffing levels, needed expertise, and established schedules for the design and construction of the NIIP. Lack of funding has also impacted the ability to transfer completed features and accomplish correction of construction deficiencies identified in the 1988 Office of the Inspector General's Audit Report.

The NIIP facilities are being constructed in 11 blocks of approximately 10,000 acres each. Blocks 1 through 8 have been completed and Block 9 is about 28 percent complete. Approximately 77,700 acres of land are currently available for irrigation. The farmland served by the NIIP is operated by the Navajo Agricultural Products Industry, an enterprise of the Navajo Nation, charged with managing and operating a commercial farm on lands held in trust for the Navajo Nation. During 2015, the farm produced high value crops including potatoes, wheat, corn, and beans processed and marketed under the "Navajo Pride" brand.

The fiscal year 2012 Office of Management and Budget (OMB) passback language stated that the Navajo Nation, BIA, and OMB should meet to negotiate an equitable settlement for reasonable compensation to the Navajo Nation in lieu of completion, or develop options for completing the NIIP. Pending these negotiations, the BIA suspended future Block 9 work and reduced the fiscal year 2011 NIIP funding transferred to Reclamation to \$3 million.

The fiscal year 2015 BIA appropriation transferred to Reclamation was \$2,469,560. The total fiscal year 2016 funding level is expected to remain at approximately the same level as the 2015 level. The fiscal year 2016 construction budget will be used to fund the correction of construction deficiencies, correct transfer inspection punch list items, perform operation and maintenance functions for features still in construction status, and continue design work for canal and pumping plant automation.

It is important to note that Reclamation remains committed to completing the project as funding is made available and to provide technical support to the BIA.

### **3. Utah**

#### **a. Central Utah Project**

The Central Utah Project (CUP), located in the central and east central part of Utah, was constructed in part by the Bureau of Reclamation and is now being completed by the Central Utah Water Conservancy District in Orem, Utah, the local project sponsor. It is the largest water resources development program ever undertaken in the State of Utah. The CUP provides water for irrigation and municipal and industrial uses. In 2002, Congressional action restored hydropower generation as an authorized project purpose. Benefits include recreation, fish and wildlife, flood control, water conservation, water quality control, and area development. The Initial Phase, authorized in 1964, originally consisted of four units: Bonneville, Jensen, Upalco, and Vernal. An Ultimate Phase consisted of the Ute Indian Unit.

A sixth unit; the Uintah Unit, was authorized by separate legislation in 1968. The largest of the six units is the Bonneville Unit which involves the diversion of water from the Uintah Basin, a part of the Colorado River Basin, to the Great Basin, with associated resource developments in both basins. The other units – Jensen, Uintah, Upalco, Ute Indian, and Vernal – were intended to provide for local development in the Uintah Basin. Work on the Uintah and Upalco units was discontinued, in major part due to objections from the Ute Indian Tribe. The Ute Indian Unit was deauthorized by Congress in the Central Utah Project Completion Act (CUPCA) of 1992.

### (i). **Bonneville Unit**

The completed Bonneville Unit will deliver a permanent supply of 42,000 acre-feet of irrigation water and 157,750 acre-feet of municipal and industrial water. A key feature of the Bonneville Unit is the trans-basin diversion of 101,900 acre-feet (annual average) of water from the Uintah Basin to the Wasatch Front (Utah County cities and the Salt Lake City metropolitan area).

Central Utah Project Completion Act of 1992. Legislation enacted in 1992 (P.L. 102-575, CUPCA), significantly reformed implementation of the CUP. Among many changes, the Act increased the ceiling to allow completion of the Bonneville Unit of the CUP, authorized new portions and deauthorized old portions of the original plan, provided Indian water rights settlement benefits, and more. The legislation provides that the project's local sponsor, the Central Utah Water Conservancy District (District), will plan and construct the remaining CUP-Bonneville Unit features; the Utah Reclamation Mitigation and Conservation Commission, an independent federal commission created under CUPCA, will complete the associated fish and wildlife mitigation; the Secretary of the Interior will oversee implementation of CUPCA; and the District and/or Department of the Interior may contract with Reclamation for technical services. The Department of the Interior's CUPCA Office and the District completed a Definite Plan Report in 2004 that will ensure that the Bonneville Unit is completed under the remaining ceiling.

Utah Lake Drainage Basin Water Delivery System (Utah Lake System). The final component of the Bonneville Unit to be constructed is the Utah Lake System. The Department of the Interior published the Utah Lake System Final Environmental Impact Statement on September 30, 2004, and on December 22, 2004, the Assistant Secretary for Water and Science signed the Record of Decision. Due to recent reductions in construction funding, the Utah Lake System is expected to be significantly delayed. Utah Lake System project pipelines that have been completed or that are currently under construction include:

<b>Feature</b>	<b>Diameter (Inches)</b>	<b>Design Capacity</b>	<b>Length</b>	<b>Construction Status</b>
Spanish Fork Canyon (three separate reaches)	96	365 cfs	7 miles	Complete
Spanish Fork – Provo Reservoir Canal Under Construction (five separate reaches)	60	120 cfs	20 miles	Mapleton, Springville, and Provo reaches are complete. Orem reaches are under construction.
Mapleton – Springville Lateral	54	125 cfs	5.5 miles	Phase 1 is complete and Phase 2 is under construction

Utah Lake System project pipelines that are to be constructed in the future include:

Feature	Diameter (Inches)	Design Capacity	Length	Construction Status
Spanish Fork – Santaquin	60	120 cfs	18 miles	---
Santaquin – Mona Reservoir	24	20 cfs	7.7 miles	---

The Utah Lake System includes a plan for hydroelectric power generation in the Diamond Fork area. The 2004 Definite Plan Report described this development as project facilities to be constructed with federal funds. The Department of the Interior is now considering non-federal development of power generation at Diamond Fork. This would include the following projects:

Feature	Rating	Construction Status
Sixth Water	45 megawatts	Feasibility study is underway
Upper Diamond Fork	5 megawatts	Feasibility study is underway

Bonneville Unit Pilot Program. Public Law 107-366, enacted December 19, 2002, amended CUPCA and, among other things, authorized implementation of the Bonneville Unit Pilot Program (Pilot Program). The Pilot Program is intended to develop a relationship among the Secretary of the Interior, Central Utah Water Conservancy District, Utah Reclamation Mitigation and Conservation Commission, and Reclamation for long-term management of the CUP. Although the Pilot Program officially ended in 2007, the parties continue to cooperatively manage the CUP following the Pilot Program model.

Lease of Power Privilege at Jordanelle Dam. As early as 1979, Bonneville Unit environmental documents specifically described the construction and operation of a hydroelectric facility below Jordanelle Dam. By 1987, Reclamation had decided to defer construction of the Jordanelle Hydropower Project until the construction and operation could be accomplished under a lease of power privilege – a partnership among federal and non-federal entities to provide for the non-federal generation of power on Reclamation facilities. In 2000, through a competitive process of requesting and reviewing proposals, the Department of the Interior selected the Central Utah Water Conservancy District and Heber Light & Power as joint lessees for power development at Jordanelle. The Department of the Interior and the lessees executed a lease agreement in 2005 after approval of an environmental assessment for the project. Fabrication of the turbines and generators began late in 2005 and construction of the building began in late 2006. The hydropower facility, which has been certified by the Low Impact Hydropower Institute, began generating power on July 1, 2008.

Lease of Power Privilege at the Spanish Fork Flow Control Structure. A *Federal Register* Notice for hydropower development under a lease of power privilege at the Spanish Fork Flow Control Structure was issued on May 11, 2011. On March 9, 2012, a joint proposal submitted by the Central Utah Water Conservancy District, Strawberry Water Users Association, and South Utah Valley Electric Service District was selected as the potential lessee. The potential lessee has a five- year period in which to negotiate a lease contract with the United States.

Olmsted Hydroelectric Powerplant Replacement Project. In 1990, Reclamation acquired the Olmsted facilities and water rights in order to secure water for the Bonneville Unit of the Central Utah Project. PacifiCorp continued to operate the Olmsted Powerplant under terms of a settlement agreement until September 2015, when, operation, maintenance, and replacement responsibilities were assumed by the United States. In order to maintain a full water supply for the Bonneville Unit, the Olmsted water rights must be protected through continuous power generation. The Olmsted Powerplant has been in operation for over 100





Jordanelle Dam, Bonneville Unit, CUP, courtesy of Bureau of Reclamation



years and is in a state of disrepair. The Replacement Project work will include lining the existing rock tunnel, replacing the pressure box and penstocks, and construction of a new powerplant. An environmental assessment has been completed and the Department of the Interior, Reclamation, and Central Utah Water Conservancy District have finalized agreements for implementation and funding of the project. Final design is scheduled to be completed in the spring of 2016 and construction completion is scheduled for the spring of 2018.

**Reservoirs and High Mountain Lakes.** The Bonneville Unit includes five reservoirs constructed by Reclamation as storage facilities for project irrigation, municipal and industrial storage, and recreational use. The five reservoirs are Jordanelle, Strawberry, Starvation, Currant Creek, and Upper Stillwater. In addition, three high mountain lakes were reconstructed to provide storage in conjunction with the municipal and industrial system.

**Jordanelle Reservoir** is the newest reservoir with recreation facilities completed in 1998. Recreation and public use is managed by the Utah Division of Parks and Recreation under an agreement with Reclamation. There are two main developed recreation areas: Hailstone and Rock Cliff. Hailstone is a large developed campground and day-use area located on the west side of the reservoir. Rock Cliff is located on the southeast side of the reservoir and offers a quieter experience with walk-in campgrounds.

Due to intense private development pressure around the reservoir, a resource management planning process concluded in 2012. The resource management plan guides the development and management of land and recreation resources around the reservoir that are under Reclamation's jurisdiction.

Phase I of a recreation rehabilitation program at Jordanelle was put out for bid in December 2013. Construction of this phase modified and expanded the Hailstone entrance facilities and roadway including remodeling the existing entrance station, constructing a new entrance station, and creating three inbound lanes that will feature a card swipe kiosk.

The Utah Division of Wildlife Resources has taken aggressive steps to prevent the spread of invasive mussel species (quagga and zebra) throughout its waters. The State of Utah has an active interdiction and inspection program and waters are regularly sampled and sent to Reclamation's laboratory in Denver, Colorado, for analysis to detect the presence of larval mussels. Jordanelle's current status is listed as "not detected." One of the 2013 samples was determined to be "inconclusive," which means that a plankton sample showed an initial finding of veligers although veliger DNA could not be confirmed. No adult mussels have been found.

**Strawberry Reservoir** was enlarged in 1974 under authority of the Colorado River Storage Project Act of 1956 (before the enactment of CUPCA). Soldier Creek Dam, completed in 1973, expanded the capacity of Strawberry Reservoir from 283,000 acre-feet to a maximum capacity of 1,106,500 acre-feet and a total surface area of 17,163 acres. The original Strawberry Dam, constructed by Reclamation in 1922, was deliberately breached in 1985. As part of Reclamation's commitment to provide recreation opportunities, new facilities were built. There are four main developed areas: Strawberry Bay, Soldier Creek, Renegade Point, and Aspen Grove.

Recreation management at Strawberry Reservoir is under the jurisdiction of the U.S. Forest Service, Uinta National Forest. The managed recreation season is May through October and there is high use on holidays and weekends. Ice fishing is very popular during the winter months. Available fish species include rainbow and cutthroat trout and kokanee salmon. Strawberry Reservoir is considered by many to be Utah's premier trout fishing lake, with trout up to 24 inches taken regularly.

Ongoing monitoring efforts for invasive mussel species have not resulted in any positive results and the lake is considered to be free of mussels at this time.

**Starvation Reservoir** is a large reservoir on the Strawberry River in the Uintah Basin. The reservoir, filled by surplus winter and spring flows from the Duchesne and Strawberry rivers, is large enough for all water sports and has a state park with a campground. Starvation State Park was established in 1972, two years after construction of Starvation Dam. The Utah Division of Parks and Recreation manages recreation at Starvation Reservoir under an agreement with Reclamation. Facilities in the main park were modernized in 2013 and expanded under a state-wide recreation rehabilitation program, which is a 50-50 cost-share partnership between the State of Utah and Reclamation.

Ongoing monitoring efforts for invasive mussel species have not resulted in any positive results and the lake is considered to be free of mussels at this time.

**Currant Creek Reservoir** is a high elevation lake (7,680 feet) with a mixed open and timbered setting. Development began in 1977 with construction of Currant Creek Dam. Currant Creek Reservoir finished filling in 1982. The reservoir shoreline is 85 percent under the jurisdiction of the U.S. Forest Service while the remaining 15 percent is private with restricted access. Recreation management at Currant Creek is under the jurisdiction of the U.S. Forest Service, Uinta National Forest. Winter access is restricted as the canyon access road is not plowed.

Ongoing monitoring efforts for invasive mussel species have not resulted in any positive results and the lake is considered to be free of mussels at this time.

**Upper Stillwater Reservoir** is another high mountain reservoir that has one main campground. The reservoir serves as a popular trailhead into the High Uintas Wilderness with the boundary located only one mile north of the dam near the high water line for the reservoir. Recreation management is under the jurisdiction of the U.S. Forest Service, Ashley National Forest. A new memorandum of agreement between Reclamation and the U.S. Forest Service was signed in 2009. The managed recreation season at Upper Stillwater Reservoir is from June through September with high use on holidays and weekends. Boating use is restricted to non-motorized craft and fishing is not allowed from any watercraft.

**High Mountain Lakes** include Washington Lake, Trial Lake, and Lost Lake with a total reservoir capacity of 5,788 acre-feet. Located in the Wasatch Cache National Forest, these lakes were reconstructed to provide irrigation water for Summit County, Utah. Recreation at the lakes is managed by the U.S. Forest Service and allows non-motorized boating and fishing. The lakes are at an elevation of over 9,500 feet and are only accessible during the summer months. The CUPCA also authorized the stabilization of additional high mountain lakes. As part of the Uintah Basin Replacement Project, the Utah Reclamation and Mitigation Commission stabilized 13 lakes. Authorization still remains for additional lake stabilization in the Uinta Mountains.

## **(ii). Jensen Unit**

The Jensen Unit in northeastern Utah provides about 5,300 acre-feet of water for municipal and industrial uses and 4,600 acre-feet for irrigation. Key project features include Red Fleet Dam and reservoir, Tyzack Aqueduct Reach 1, and Tyzack Aqueduct Reach 2.

Recreation at Red Fleet Reservoir is managed by the Utah Division of Parks and Recreation under an agreement with Reclamation. In 2008, plankton sampling at Red Fleet showed evidence of quagga mussels. By early 2014, all forms of listing for quagga mussel

contamination were lifted. It is the objective of the State of Utah to decontaminate all boats prior to their leaving Red Fleet Reservoir. A resource management plan was completed for Red Fleet Reservoir in 2013. Planning for recreation facility rehabilitation and enhancement is underway with construction scheduled to begin in 2016.

### **(iii). Uintah and Upalco Units**

Section 203(a) of the CUPCA of 1992 provided for the construction of the Uintah Basin Replacement Project to replace, in part, the Uintah and Upalco units which had never been constructed. Public Law 107-366, enacted December 19, 2002, deauthorized the Uintah and Upalco units, transferring the unexpended budget authority to units of the CUP for construction of the Uintah Basin Replacement Project, Utah Lake System, and other CUPCA purposes. The Central Utah Water Conservancy District has completed construction of the primary features (including the enlarged Big Sand Wash Dam) of the Uintah Basin Replacement Project. The Big Sand Wash Feeder Diversion Structure and Pipeline was completed in March of 2004. The Big Sand Wash Reservoir enlargement was completed in September 2006 followed by completion of the Big Sand Wash Roosevelt Pipeline in September 2008.

Ongoing monitoring efforts for invasive mussel species have not resulted in any positive results and the lake is considered to be free of mussels at this time.

### **(iv). Ute Indian Unit**

The Ute Indian Unit was deauthorized in 1992 by Section 201(b) of the Central Utah Project Completion Act.

### **(v). Vernal Unit**

The Vernal Unit in northeastern Utah supplies supplemental irrigation water to about 14,700 acres and approximately 1,600 acre-feet of municipal and industrial water annually to the communities of Vernal, Naples, and Maeser. Key project features include Steinaker Dam and reservoir, Fort Thornburgh Diversion Dam, Steinaker Service Canal, and Steinaker Feeder Canal.

Following observed “sloughing” of riprap on the Steinaker Dam face, a Level 1 Emergency Response was issued on September 24, 2014, and subsequently terminated on October 10, 2014. Enhanced monitoring of the dam began immediately upon notification of the sloughing and continues. A corrective action study is underway. The Uintah Water Conservancy District continues to operate the reservoir under a reservoir elevation restriction. Corrective action is expected to be implemented in 2018 to reduce risk of failure associated with the sloughing incident.

Steinaker State Park was opened to the public in 1964. Recreation at Steinaker Reservoir is managed by the Utah Division of Parks and Recreation under an agreement with Reclamation. A resource management plan for the reservoir was completed in 2013. Planning for recreation facility rehabilitation is underway with construction scheduled to begin in 2016. Steinaker’s location makes it a popular base for exploring the surrounding geologic and paleontologic features of northeastern Utah and Flaming Gorge National Recreation Area.

Ongoing monitoring efforts for invasive mussel species have not resulted in any positive results and the lake is considered to be free of mussels at this time.

## **b. Emery County Project**

The Emery County Project is located in east-central Utah near the towns of Huntington, Castle Dale, and Orangeville. The project, which includes an irrigable area of almost 19,000 acres, is in the Green River Basin. Principal construction features of the project are Joes Valley Dam and reservoir on Seely Creek; Swasey Diversion Dam 10 miles downstream from Joes Valley Dam; Cottonwood Creek-Huntington Canal; Huntington North Service Canal; and Huntington North Dam and East and West Dikes which form Huntington North Reservoir. The project provides an estimated average of 28,100 acre-feet of water annually for irrigation of 18,755 acres, of which 771 acres is land previously unirrigated. In the mid-1970s, the irrigable acreage was reduced to 14,171 with 4,604 acres designated "not for service." In 1981, the irrigable area was increased to 16,170 acres with 2,605 acres in the "not for service" category. The project supplies 6,000 acre-feet of water for industrial and municipal purposes.

Recreation facilities have been constructed at both Joes Valley and Huntington North reservoirs. Recreation facilities at Joes Valley are operated by the U.S. Forest Service and recreation at Huntington North is managed by the Utah Division of Parks and Recreation, both under agreements with Reclamation. Although both Joes Valley and Huntington North tested inconclusive for invasive mussels in 2008, subsequent sampling efforts have not detected their presence in either water body.

## **4. Wyoming**

### **a. Eden Project**

The Eden Project furnishes an irrigation water supply for 17,010 acres. Project lands are in the vicinity of the towns of Farson and Eden in southwestern Wyoming about 40 miles north of Rock Springs. Project features include Big Sandy Dam and reservoir, Eden Dam and reservoir, Little Sandy Feeder Canal, Big Sandy Feeder Canal, Means Canal, Eden Canal, and a lateral and drainage system. Big Sandy Dam (completed in 1952) was constructed to replace some storage in the existing off-stream Eden Reservoir and to supply water for additional project lands. The Means Canal conveys water from Big Sandy Reservoir to the Westside Lateral, which serves lands on the west side of Big Sandy Creek, and to the Eden Canal which serves lands on the east side of the creek. Little Sandy Diversion Dam diverts water into the Little Sandy Feeder Canal. Water can be diverted from Big Sandy Dam to Eden Reservoir through the Big Sandy Feeder Canal. Water is drawn from Eden Reservoir to serve Eden Canal and Farson Lateral.

The Wyoming Water Development Office (WWDO) is evaluating the potential to increase the storage of Big Sandy Reservoir. The WWDO would like to increase the storage by raising the top of active conservation three to five feet. WWDO entered into an agreement with Reclamation in 2015 to gather design data, develop design alternatives, and select a preferred alternative for modifications. Collection of design data has included geotechnical investigations through drilling and development of a geology report. A LIDAR survey was also completed to obtain detailed ground elevations and cross-sections required for hydrologic modeling. Additionally, preliminary National Environmental Policy Act work has begun to obtain the necessary permits and clearances required for the modifications.

Recreation facilities at Big Sandy Reservoir are administered by the Bureau of Reclamation's Provo Area Office. In 2010, the Wyoming Game and Fish Commission implemented emergency regulations to stop the spread of aquatic invasive species in Wyoming waters. Under this regulation, all watercraft are required to purchase and display an aquatic invasive species decal. Funds raised from purchase of the decals are used to pay for

public education programs and prevention efforts to keep invasive quagga and zebra mussels from being introduced. Efforts include watercraft inspections, decontamination if warranted, and possible criminal and civil penalties for anyone found violating the regulations. To date, no mussels have been detected in Wyoming waters.

#### **b. La Barge Project**

The La Barge Project was found to be infeasible and was not constructed.

#### **c. Seedskadee Project**

The Seedskadee Project is located in the Upper Green River Basin in southwestern Wyoming. It provides storage and regulation of the flows of the Green River for power generation, municipal and industrial use, fish and wildlife, and recreation. Principal features of the project are the Fontenelle Dam, powerplant, and reservoir. The reservoir is operated for municipal and industrial water use, power production, flood control, and the downstream fishery and wildlife refuge.

Recreation facilities at Fontenelle Reservoir are managed by the Bureau of Land Management under an agreement with Reclamation. Fontenelle Creek Recreation Area is the only developed site on the reservoir, although there are three other campgrounds (Tailrace, Weeping Rock, and Slate Creek) located below Fontenelle Dam that are more primitive.

In 2010, the Wyoming Game and Fish Commission implemented emergency regulations to stop the spread of aquatic invasive species in Wyoming waters. Efforts include watercraft inspections, decontamination if warranted, and possible criminal and civil penalties for anyone found violating the regulations. No high risk inspections or decontaminations were conducted and no presence of mussels was detected.

Reclamation manages approximately 135,000 acres of withdrawn land adjacent to and downstream of Fontenelle Dam and reservoir that are no longer needed for project purposes. Reclamation submitted a request to revoke its withdrawal of these lands to the Bureau of Land Management on December 31, 2014. The Bureau of Land Management is reviewing the revocation request and expects to complete its review in the spring or summer of 2016. If acceptable, the withdrawal will be relinquished and the lands returned to the public trust to be managed by the Bureau of Land Management.

### **5. Colorado and New Mexico**

#### **a. Animas-La Plata Project**

The Animas-La Plata Project is located in southwestern Colorado and northwestern New Mexico and was first authorized by the Colorado River Basin Project Act of 1968 (P.L. 90-537). In 1988, it was incorporated into the Colorado Ute Indian Water Rights Settlement Act (P.L. 100-585). The Colorado Ute Settlement Act Amendments of 2000 (Title III of P.L. 106-554, December 21, 2000) provide for implementation and completion of the project. Approval to begin construction was granted in October 2001 and initial site work started in April 2002. Construction of Ridges Basin Dam, Durango Pumping Plant, and Lake Nighthorse (formerly called Ridges Basin Reservoir) will provide the Southern Ute Indian and Ute Mountain Ute Tribes with a reliable water supply for their future needs, while protecting scarce water resources for existing water users in southwestern Colorado and northwestern New Mexico. It remains a priority of the Secretary of the Interior to complete the Animas-La Plata Project in a cost effective and efficient manner.



Fontenelle Power Plant, Wyoming - Courtesy of Bureau of Reclamation



The Animas-La Plata Project consists of four major components: Ridges Basin Dam, Durango Pumping Plant, and Ridges Basin Inlet Conduit located in Colorado; and the Navajo Nation Municipal Pipeline (NNMP) located in New Mexico. The NNMP consists of approximately 30 miles of 24-inch diameter pipeline running from Farmington, New Mexico, to Shiprock, New Mexico, and will provide for the conveyance of 4,680 acre-feet of municipal water per year to Navajo Nation communities. The project consists of various other elements including multiple utility and road relocations; fish, wildlife, and wetlands mitigation; a permanent operating facility; and cultural resources investigations. The reservoir formed by Ridges Basin Dam was named Lake Nighthorse in honor of Senator Ben Nighthorse Campbell who played an instrumental role in the Colorado Ute settlement and construction of the Animas-La Plata Project.

The Colorado portion of the project is 100 percent complete and the New Mexico portion (NNMP) is 90 percent complete. Project closeout work is continuing utilizing carryover funding from previous years.

All Colorado features of the Animas-La Plata project are currently operational. In August 2012, water was released from Lake Nighthorse down Basin Creek to successfully test the Basin Creek features. An operation and maintenance contract has been signed with the Animas-La Plata Operations, Maintenance and Replacement Association (ALP OM&R Association) that allows project sponsors to operate Colorado project features. Transfer of OM&R responsibilities to the ALP OM&R Association occurred on April 1, 2013. Lake Nighthorse began filling on May 4, 2009, and filled for the first time on June 29, 2011. The maximum water surface elevation of 6,882 feet equates to 123,541 acre-feet in storage and a water surface area of approximately 1,500 acres.

In New Mexico, pipe laying operations on the NNMP were completed in July 2012; however, all NNMP features will not be complete until 2016. In May 2014, a landslide occurred on a hillside above the San Juan River near the NNMP and damaged a section of the pipeline. In fiscal year 2015, money was transferred from other Reclamation programs to provide funding for repair of the damaged section of pipe. Additional funds are being sought to complete closeout of the NNMP. The repair work and completion of all NNMP features is anticipated to occur in fiscal year 2016.

The Bureau of Reclamation, Animas-La Plata Water Conservancy District, and community of Durango developed a Recreation Master Plan for Lake Nighthorse in 2011. The City of Durango developed a subsequent recreation plan in 2014. A National Environmental Policy Act compliance review and analysis to determine the recreation plan is now being completed. A Cultural Resource Management Plan is also being completed for compliance with the National Historic Preservation Act. Presently, the area in and around Lake Nighthorse remains closed to public use until Reclamation secures a recreation manager and appropriate recreation facilities are in place to provide for public safety and protect land and water resources from damage due to uncontrolled use. The City of Durango has expressed interest in developing the initial recreation facilities and in managing these facilities. Negotiations among the City, Reclamation, and the ALP OM&R Association are ongoing.

When a managing partner is secured for Lake Nighthorse, Reclamation will work closely with them to develop effective solutions to manage the spread of invasive mussels. In 2009, Reclamation conducted a mussel facility risk assessment at Ridges Basin Dam to determine future risk of infestation; however, no additional assessments have been conducted since the lake is not open to the public. Reclamation is working on design and construction



of an entrance station for boat inspection and decontamination facilities. Construction is anticipated to begin in 2016. A site plan for an inspection/decontamination station has been completed and the inspection station will be among the initial recreation facilities developed. Once the lake is open to public boating, inspections will begin.

## **b. Pine River Extension Project**

The Pine River Extension Project was found to be infeasible and was deleted in the 1968 Colorado River Basin Project Act.

## **c. San Juan-Chama Project**

The San Juan-Chama Project consists of a system of diversion structures and tunnels for transmountain movement of water from the San Juan River Basin to the Rio Grande Basin. Primary purposes of the San Juan-Chama Project are to furnish a water supply to the middle Rio Grande Valley for municipal, domestic, and industrial uses. The project is also authorized to provide supplemental irrigation water and incidental recreation and fish and wildlife benefits. The regulating and storage reservoir is formed by Heron Dam on Willow Creek just above the point where Willow Creek enters the Rio Chama. Heron Reservoir is operated by Reclamation in compliance with applicable federal and state laws including the San Juan-Chama Project authorization and the Rio Grande and Colorado compacts. Under these laws, only imported San Juan-Chama Project water may be stored in Heron Reservoir; there are no provisions for storing native Rio Grande water. Thus, all native Rio Grande water is released to the river below Heron Dam.

The Pojoaque Irrigation Unit, made up of Nambe Falls Dam and storage reservoir, provides supplemental irrigation water for about 2,800 acres in the Pojoaque Valley. It serves the Pojoaque Valley Irrigation District and the Indian pueblos of San Ildefonso, Nambe, and Pojoaque.

Reclamation, in coordination with the Western Area Power Administration, is considering hydroelectric power development on the San Juan-Chama Project under a lease of power privilege at up to four conduit drops along the project. The station drops are all located downstream of the Azotea Tunnel Outlet along Willow Creek and are all features of the San Juan-Chama Project. Western would have the first opportunity to purchase and/or market the power that would be generated and no federal funds will be made available for power development. A *Federal Register* Notice soliciting public interest was published on August 7, 2013, and proposals were due by January 6, 2014. Reclamation selected Albuquerque Bernalillo County Water Utility Authority as the preliminary lessee and is working to execute a preliminary lease and funding agreement for the development of non-federal hydropower on the project.

Recreation at Heron Reservoir is managed by New Mexico State Parks under an agreement with Reclamation. Recreation at Nambe Falls Reservoir is managed by the Nambe Pueblo under an agreement with Reclamation.

In April 2009, New Mexico's governor signed the Aquatic Invasive Species Control Act. The Act allows the New Mexico Department of Game and Fish to take actions to protect New Mexico's waters from the negative impacts of aquatic invasive species. The Act requires that all boats, personal watercraft, and equipment used in waters infested with invasive species be certified as decontaminated before entering New Mexico waters. Plankton sampling is being conducted at each reservoir and is sent to the Reclamation laboratory in Denver, Colorado, for analysis as part of a state-wide monitoring effort. To date, no evidence of invasive mussels has been found at Heron Reservoir. The Pojoaque Pueblo does not have an active mussel inspection program; therefore, the status of Nambe Falls reservoir is unknown at this time.

## 6. Colorado and Wyoming

### a. Savery-Pot Hook Project

The Savery-Pot Hook Project was found to be infeasible and was not constructed.

## 7. Utah and Wyoming

### a. Lyman Project

The Lyman Project lands are in southwestern Wyoming; however, much of the drainage area and one storage feature are in Utah, just across the Utah-Wyoming state line. The Lyman Project includes Meeks Cabin Dam and reservoir and Stateline Dam and reservoir. The project regulates the flows of Blacks Fork and the east fork of Smiths Fork for irrigation, municipal and industrial use, fish and wildlife conservation, and recreation. Recreation at Meeks Cabin and Stateline dams and reservoirs is the responsibility of the U.S. Forest Service, Wasatch-Cache National Forest, under authority of Public Law 89-72, as amended.

## E. RECREATIONAL USE AT RESERVOIRS

Colorado River Storage Project facilities provide for a host of scenic and recreational opportunities that have significant economic benefits. While exact use figures are not available, it is estimated that recreation use at CRSP initial facilities totaled just under 4 million for calendar year 2015, demonstrating the high value placed on outdoor recreation opportunities in the Intermountain West.

A centralized data base has been developed to monitor recreation use at Reclamation reservoirs. Table 7 shows visitor use figures (most recent data where available) for Colorado River Storage Project reservoirs, participating project reservoirs, and other Reclamation reservoirs located in the Upper Colorado River Basin:

**Table 7**  
**Most Current Visitor Use Figures**  
**for Reclamation Reservoirs with**  
**Recreation Facilities**

Recreation Area	Estimated Visitation	Period of Data Collection
Big Sandy Reservoir	8,001	Oct 1, 2014, through Sept 30, 2015
Crawford Reservoir	105,343	July 1, 2013, through June 30, 2014
Curecanti National Recreation Area (Wayne N. Aspinall Unit)	951,601	Oct 1, 2014, through Sept 30, 2015
Currant Creek Reservoir	---	Data not available from USFS*
Eden Reservoir	---	Data not available
Flaming Gorge National Recreation Area	---	Data not available from USFS
Fontenelle Reservoir	4,201	Oct 1, 2014, through Sept 30, 2015
Fruitgrowers Reservoir	2,500	Oct 1, 2014, through Sept 30, 2015
Glen Canyon National Recreation Area	2,273,587	Jan 1 through Oct 30, 2015
Heron Reservoir	63,751	July 1, 2014, through June 30, 2015
Huntington North Reservoir	25,191	July 1, 2014, through June 30, 2015

**Table 7 continued**

Jackson Gulch Reservoir	35,064	July 1, 2013, through June 30, 2014
Joes Valley Reservoir	----	Data not available from USFS
Jordanelle Reservoir	357,869	July 1, 2014, through June 30, 2015
Lemon Reservoir	---	Data not available from USFS
McPhee Reservoir	---	Data not available from USFS
Meeks Cabin Reservoir	---	Data not available from USFS
Nambe Falls Reservoir	---	Data not available from Nambé Pueblo
Navajo Reservoir (Colorado)	241,475	July 1, 2013, through June 30, 2014
Navajo Reservoir (New Mexico)	531,630	July 1, 2014, through June 30, 2015
Paonia Reservoir	23,422	July 1, 2013, through June 30, 2014
Red Fleet Reservoir	24,319	July 1, 2014, through June 30, 2015
Ridgway Reservoir	347,525	July 1, 2013, through June 30, 2014
Rifle Gap Reservoir	210,626	July 1, 2013, through June 30, 2014
Silver Jack Reservoir	---	Data not available from USFS
Starvation Reservoir	87,196	July 1, 2014, through June 30, 2015
Stateline Reservoir	---	Data not available from USFS
Steinaker Reservoir	30,923	July 1, 2014, through June 30, 2015
Strawberry Reservoir	---	Data not available from USFS
Taylor Park Reservoir	---	Data not available from USFS
Upper Stillwater Reservoir	---	Data not available from USFS
Vallecito Reservoir	7,608	Jan 1, 2015, through Dec 31, 2015 Data for west side of reservoir only. No data available from USFS for east side campgrounds.

\*U.S. Forest Service

## **F. OTHER RECLAMATION PROJECTS IN THE UPPER COLORADO RIVER BASIN**

Significant Reclamation projects in the Upper Colorado River Basin that either use water from the Colorado River or are transbasin water diversion projects are discussed below. While these projects are not part of the CRSP, they are worth noting.

### **1. Colorado**

#### **a. Colorado-Big Thompson Project**

The Colorado-Big Thompson Project is a multipurpose transmountain, transbasin water diversion and delivery project located in Colorado. The project stores, regulates, and diverts water from the Colorado River west of the Rocky Mountains, providing supplemental water for irrigation of 720,000 acres of land east of the Rocky Mountains. The project historically diverts 230,000 acre-feet annually from the headwaters of the Colorado River with a maximum possible diversion of 310,000 acre-feet. The Northern Water Conservancy District apportions the water diverted from the West Slope, which is used for irrigation in more than 120 ditches and 60 reservoirs. Besides irrigation water uses, the project also provides water for industrial, hydroelectric power, recreation, and environmental uses.

Although the Colorado-Big Thompson Project is not a participating project of the CRSP because it does not participate in the Upper Colorado River Basin Fund, it does utilize water diverted from the Upper Colorado River system to the eastern slope of Colorado. Reclamation's Eastern Colorado Area Office, located in Loveland, Colorado, directs the operation and maintenance activities of the Colorado-Big Thompson Project in concert with its partner, the Northern Colorado Water Conservancy District.

The Colorado-Big Thompson Project's principal storage facilities on the West slope include: Lake Granby, Grand Lake, Shadow Mountain, Willow Creek Reservoir, and Green Mountain as a Colorado River replacement reservoir. On the East slope of the Rocky Mountains, the major storage facilities are Carter Lake and Horsetooth Reservoir.

In September 1996, a settlement was executed to resolve a water right case referred to as the Orchard Mesa Check Case. Provisions of the settlement included operating criteria for the 66,000 acre-foot historic users pool of Green Mountain Reservoir. The criteria define the terms and conditions under which water in the historic users pool may be deemed surplus to the needs of historic users pool beneficiaries in western Colorado. The settlement provides for the delivery of surplus historic users pool water to the Grand Valley Powerplant and for other non-consumptive beneficial uses in western Colorado, the return flows from which result in augmenting flows in the 15-Mile Reach of the Colorado River.

National Environmental Policy Act compliance on a project (10,825 Project) to fulfill a commitment of water users who divert from the Colorado River or its tributaries upstream of the Gunnison River was completed in March 2012. The compliance process is outlined in the 1999 Final Programmatic Biological Opinion for Bureau of Reclamation's Operations and Depletions, Other Depletions, and Funding and Implementation of the Recovery Program Actions in the Upper Colorado River Above the Confluence with the Gunnison River. The 10,825 Project provides for 5,412.5 acre-feet per year of water to be released from Granby Reservoir and delivered to an entity in the Grand Valley, allowing the State of Colorado to protect the water during conveyance to and through the 15-Mile Reach of the upper Colorado River.

Contents of reservoirs within the Colorado-Big Thompson Project as of September 30, 2015, were as follows: Lake Granby, 500,100 acre-feet; Grand Lake, 796 acre-feet; Shadow Mountain, 16,862 acre-feet; Willow Creek Reservoir, 9,028 acre-feet; Green Mountain Reservoir, 108,779; Carter Lake, 59,161 acre-feet; and Horsetooth Reservoir, 96,346 acre-feet. During water year 2015, transmountain diversions from the Colorado River Basin in Colorado by the Colorado-Big Thompson Project via the Adams Tunnel totaled 113,856 acre-feet.

#### **b. Dominguez Project (Whitewater)**

The Dominguez Project was found to be infeasible and was not constructed.

#### **c. Fruitgrowers Dam Project**

The Fruitgrowers Dam Project, located in southwestern Colorado, furnishes irrigation water to nearly 2,700 acres of land immediately downstream of Fruitgrowers Dam. Structures built by Reclamation include Fruitgrowers Dam, Dry Creek Diversion Dam, and Dry Creek Diversion Ditch. Other diversion structures and the canal and lateral system were constructed by private interests.

Reclamation manages public use at Fruitgrowers Reservoir. The reservoir and surrounding area has been listed as an “important” bird site by the State of Colorado and it has been determined to be a “globally significant” area under the American Bird Conservancy criteria because of its importance to migrating sandhill cranes and white-faced ibis as well as the presence of some southwestern willow flycatchers. The International Birding Association has determined that the area is an important area for shorebirds and the reservoir is listed on the Colorado Birding Trail website as the “best water birding spot on Colorado’s West Slope.” Fruitgrowers Reservoir also hosts the largest nesting colony of western grebes in Colorado, is one of only a handful of willet nesting sites in the state, and more than 200 species of birds have been sighted in the area. It has been estimated by the Audubon Society that 26 percent of the greater sandhill crane population stops at Fruitgrowers Reservoir during spring migration. In 1993, a watchable wildlife trail and viewing area were constructed near the reservoir and local volunteers from the Black Canyon Audubon Society were utilized during the spring of 2014 for cleanup and trail maintenance. In 2015, Delta County, through a license agreement with Reclamation, constructed an additional parking and viewing area on the north end of the reservoir. Water quality issues are a concern at Fruitgrowers and, as a result, the public has been discouraged from using the reservoir for boating or swimming activities.

#### **d. Fryingpan-Arkansas Project**

The Fryingpan-Arkansas Project is a multipurpose transmountain, transbasin water diversion and delivery project located in Colorado. It makes possible an average annual diversion of 69,200 acre-feet of surplus water from the Fryingpan River and other tributaries of the Roaring Fork River, on the western slope of the Rocky Mountains, to the Arkansas River Basin on the eastern slope. The historical average imports are 52,200 acre-feet. The Fryingpan-Arkansas Project originally provided a supplemental supply of irrigation water for 280,600 acres of farmland and currently provides a supplemental supply of water for 200,000 acres in the Arkansas Valley. Total project supplies may be further increased through use and reuse of project water.

Although the Fryingpan-Arkansas Project is not a participating project of the CRSP because it does not participate in the Upper Colorado River Basin Fund, it does utilize water diverted from the Upper Colorado River system to the eastern slope of Colorado. Reclamation’s Eastern Colorado Area Office, located in Loveland, Colorado, directs the operation and maintenance activities of the Fryingpan-Arkansas Project. A field office in Pueblo, Colorado, coordinates with the Southeastern Colorado Water Conservancy District and the State Division Engineer.

National Environmental Policy Act compliance on the Ruedi Round II Water Marketing Program was completed on January 16, 1990, with the signing of a Record of Decision on the proposed action. The proposed action made 46,500 acre-feet of water available for marketing to western slope contractors. In 1999, the U.S. Fish and Wildlife Service issued a programmatic biological opinion for Reclamation’s operations and depletions, other depletions, and funding and implementation of the Upper Colorado Recovery Program actions in the upper Colorado River above the confluence with the Gunnison River, which was accepted by Reclamation in January 2000. In 2013, to meet the commitment of the West Slope water users under the programmatic biological opinion and as part of the 10,825 Project, Reclamation executed a contract with the Colorado River Water Conservation District for release of up to 5,412.5 acre-feet per year of water from Ruedi Reservoir to enhance flows in the 15-Mile Reach. This water is in addition to water made available as a result of earlier Endangered Species Act consultation on the Ruedi Round II Water Marketing Program (5,000 acre-feet per year withheld from water sales and 5,000 acre-feet made available in four out of five years through reoperation/retiming of releases).

Contents of reservoirs within the Fryingpan-Arkansas Project as of September 30, 2015, were as follows: Ruedi Reservoir, 80,772 acre-feet; Turquoise Lake, 121,234 acre-feet; combined Mt. Elbert Forebay and Twin Lakes Reservoir, 131,966 acre-feet; and Pueblo Reservoir, 189,065 acre-feet. During water year 2015, transmountain diversions from the Colorado River Basin in Colorado by the Fryingpan-Arkansas Project via the Charles H. Boustead Tunnel totaled 72,863 acre-feet.

#### **e. Mancos Project**

The Mancos Project is an off-stream reservoir in southwestern Colorado completed in 1948 at a cost of \$3.9 million, all of which has been repaid by the Mancos Water Conservancy District (District). The project was authorized under the Water Conservation and Utilization Act (P.L. 76-398), as amended. It consists of Jackson Gulch Dam, a 10,000 acre-foot reservoir, an inlet canal, and an outlet canal. The District constructed and operates a 260-kilowatt powerplant at Jackson Gulch Dam under a lease of power privilege contract. The project provides supplementary irrigation water for approximately 13,746 acres and municipal and industrial water for the town of Mancos, the surrounding area, and Mesa Verde National Park. Responsibility for the operation and maintenance of project facilities was transferred to the District by contract in 1963. The term "operation and maintenance" includes replacement, as specified in Reclamation's Report to the Congress, Annual Costs of Bureau of Reclamation Project Operation and Maintenance for Fiscal Years 1993-97, dated September 1998. The Mancos Project is more than 60 years old and many features are reaching the end of their design life. The canal system is in need of extraordinary maintenance and rehabilitation, and delivery of agricultural and municipal and industrial water could be affected if these repairs are not made. The District has completed a study through a private engineering firm to assess the project's needs and repair/replace facilities including canal lining and some canal reconstruction.

Rehabilitation of the Mancos Project was authorized by P.L. 111-11. The total authorized cost of the project is \$8.25 million. The federal cost share is 65 percent and the non-federal reimbursement is 35 percent, not to exceed \$2.9 million. The law also states that "... the Secretary shall credit the District for any amounts it paid before the date of enactment of this Act for engineering work and improvements directly associated with the project." The reimbursement is authorized to be obtained through a 15-year no interest repayment contract. Reclamation provides oversight on operation, maintenance, and replacement; contract compliance; and land management and recreation issues.

Recreation at Jackson Gulch Reservoir, also known as Mancos State Park, is under the administration of the Colorado Division of Parks and Wildlife through a contract with Reclamation. Camping, fishing, boating, hiking, picnicking, wildlife viewing, and winter sports are all popular activities at the park. There is a network of multiple-use trails (foot, horse, bike, and ski) at the reservoir and one (Chicken Creek) that leads into the adjacent San Juan National Forest.

Reclamation is working closely with CDPW to develop effective solutions to manage the spread of invasive mussels including educating the public and providing materials such as signs and brochures. The CDPW is currently conducting boat inspections during the summer season on weekends, but Reclamation is also working with the U.S. Forest Service and Dolores Water Conservancy District to develop additional ways to protect the reservoir from the introduction of mussels.



## **f. Pine River Project**

The Pine River Project consists of Vallecito Dam and reservoir which were constructed to furnish supplemental water to 63,873 acres of project lands and Southern Ute lands. Vallecito Dam is located on the Pine River, 18 miles northeast of Durango, Colorado. The project stores spring floodwaters to provide a supplemental water supply to about 13,000 acres of the Southern Ute lands and about 41,000 acres of land outside the Southern Ute Reservation. Irrigation water is distributed through privately owned systems or through systems under the jurisdiction of the Bureau of Indian Affairs.

A contract between Reclamation and the Pine River Irrigation District for use of 6,700 acre-feet of Pine River Project water for municipal, industrial, and miscellaneous uses was executed on March 16, 2007. Reclamation completed National Environmental Policy Act compliance for an initial quantity of 3,000 acre-feet. Additional National Environmental Policy Act compliance will be required for the remaining 3,700 acre-feet prior to use.

Recreation at Vallecito Reservoir is under the administration of the Pine River Irrigation District, through a contract with Reclamation, with the exception of public campgrounds on the east side of the reservoir which are administered by the U.S. Forest Service. The District issued private boat dock permits through contracts with Reclamation. However, permits for private boat docks at Vallecito Reservoir will not be renewed when they expire. This is in accordance with the 1996 Vallecito Reservoir Resource Management Plan and Reclamation's policy concerning private exclusive use of project lands. Currently, two private boat dock permits remain in effect, but will expire in 2017 and 2018.

Reclamation is working closely with its recreation managing entities to develop effective solutions to manage the spread of invasive mussels including educating the public and providing materials such as signs and brochures. At Vallecito Reservoir, the Colorado Division of Parks and Wildlife provides boat inspection and decontamination facilities and also conducts plankton tow and substrate sampling.

## **g. Uncompahgre Project**

The Uncompahgre Project is located on the western slope of the Rocky Mountains in west-central Colorado. Project lands surround the town of Montrose and extend 34 miles along both sides of the Uncompahgre River to Delta, Colorado. Project features include Taylor Park Dam and reservoir, Gunnison Tunnel, seven diversion dams, 128 miles of main canals, 438 miles of laterals, and 216 miles of drains. The systems divert water from the Uncompahgre and Gunnison rivers to serve over 76,000 acres of project land.

There are six non-federal hydropower facilities either in operation or under development as leases of power privilege on the Uncompahgre Project. The Uncompahgre Valley Water Users Association (UVWUA), in partnership with Delta Montrose Electric Association (the partnership), submitted the only proposal in response to Reclamation's August 2009 *Federal Register* Notice requesting proposals for a lease of power privilege on the South Canal. Environmental compliance was completed and a final EA and Finding of No Significant Impact were issued in February 2012. A lease of power privilege was issued to the partnership in March 2012 and construction and testing was completed in July 2013 followed by full operation of two hydropower units (Drop 1 and Drop 3 of the South Canal) during the summer of 2013. Drop 1 has a capacity of 4 megawatts and generates approximately 14,300 megawatt-hours per year. Drop 3 has a capacity of 3.5 megawatts and generates approximately 12,600 megawatt-hours per year.



The UVWUA is currently working with Reclamation to develop two of the six hydropower sites on the Uncompahgre Project (South Canal Drop 2 and Drop 5). Reclamation executed a lease of power privilege with UVWUA on December 16, 2014, for Drop 2 and on November 5, 2015, for Drop 5. Construction of these two facilities is expected to be completed during the spring of 2016.

The recreation facilities at Taylor Park Reservoir are managed by the U.S. Forest Service under an agreement with Reclamation. The reservoir, with 2,400 acres of surface water, offers good fishing and includes trout species, northern pike, and kokanee salmon. Reclamation is working with its recreation managing entities to develop effective solutions to manage the spread of invasive mussels including educating the public and providing materials such as signs and brochures.

## **G. PLANNING INVESTIGATION ACTIVITIES**

The Upper Colorado Region General Planning Program budget for fiscal year 2015 was \$762,055 with approximately 59 percent being directed within the Upper Colorado River Basin. In fiscal year 2015, funding approved by Congress under General Planning was less than Reclamation's Upper Colorado Region requested. General Planning Program funds are used for Reclamation to conduct critical short-term investigation activities not funded by other projects or programs such as Rural Water or through Reclamation's WaterSMART (Sustain and Manage America's Resources for Tomorrow) programs, including: West Wide Climate Risk Assessments (WWCRA), Basin Studies, Landscape Conservation Cooperatives (LCC), Drought Contingency Planning (DCP), Title XVI Water Reclamation and Reuse Feasibility Studies, Water Conservation Field Services (WCFS), and the Cooperative Watershed Management Program (CWMP).

The WWCRA, Basin Studies, and LCC activities represent a comprehensive approach to incorporating the best available science into planning activities for climate change adaptation planning. The DCP Program provides assistance to water users for drought contingency planning, including consideration of climate change information, and to take actions that will build long-term resiliency to drought. The Title XVI Water Reclamation and Reuse Program focuses on identifying and investigating opportunities to reclaim and reuse wastewater and naturally impaired ground and surface water. The WCFS Program assists with the development or updates of water conservation and management plans to identify water management problems, evaluate options, highlight accomplishments, and plan for improvements. The CWMP supports the formation and development of locally led watershed groups to facilitate the development of multi-stakeholder watershed management projects. Reclamation solicits input from the states on their watershed needs and activities and will continue to consult with the states to tailor the CWMP in accordance with state watershed management plans. Under the WaterSMART Program, approximately \$303,000 was funded toward planning in the Upper Colorado River Basin for 2015. No funding was authorized for the Rural Water Program.

### **1. Utah**

#### **a. San Juan River to Kayenta Pipeline Investigation**

Using monies from a Reclamation Rural Water grant, this investigation is in the final stages of completing an appraisal-level study of a proposed pipeline system that would extend from an existing pump on the San Juan River at Mexican Hat, Utah, south to the community of Kayenta, Arizona. This multi-state system would also serve Navajo communities along the pipeline route, notably in the Monument Valley area in Utah.

## H. RESERVOIR OPERATIONS

### 1. 2015 Hydrology Summary and Reservoir Status

Near average streamflows were observed throughout much of the Colorado River Basin during water year 2015. Unregulated<sup>7</sup> inflow to Lake Powell in water year 2015 was 10.17 million acre-feet (maf), or 94 percent of the 30-year average,<sup>8</sup> which is 10.83 maf. Unregulated inflow to Flaming Gorge, Blue Mesa, and Navajo Reservoirs was 107, 109, and 84 percent of average, respectively.

Precipitation in the Upper Colorado River Basin was below average<sup>9</sup> during the first part of water year 2015 and above average during the second part of the water year. On September 30, 2015, the cumulative precipitation received within the Upper Colorado River Basin for water year 2015 was 102 percent of average.

Snowpack conditions trended below average<sup>10</sup> across most of the Colorado River Basin throughout the snow accumulation season. The basin-wide snow water equivalent measured 62 percent of average on April 1, 2015. Total seasonal accumulation peaked at approximately 74 percent of average on March 9, 2015. On April 1, 2015, the snow water equivalents for the Green River, Upper Colorado River Headwaters, and San Juan River Basins were 74, 81, and 47 percent of average, respectively.

During the 2015 spring runoff period, inflows to Lake Powell peaked on June 15, 2015 at approximately 53,100 cubic feet per second. The April through July unregulated inflow volume for Lake Powell was 6.71 maf which was 94 percent of average.

Lower Basin tributary inflows above Lake Mead were below average for water year 2015. Tributary inflow from the Little Colorado River for water year 2015 totaled 0.082 maf, or 57 percent of the long-term average.<sup>11</sup> Tributary inflow from the Virgin River for water year 2015 totaled 0.090 maf, or 50 percent of the long-term average.

Tributary inflows in the Lower Colorado River Basin below Hoover Dam were below average during water year 2015. Total tributary inflow for water year 2015 from the Bill Williams River was 0.015 maf, or 16 percent of the long-term average, and total tributary inflow from the Gila River was 0.003 maf.<sup>12</sup>

The Colorado River total system storage experienced a net increase of 0.281 maf in water year 2015. Reservoir storage in Lake Powell increased during water year 2015 by

<sup>7</sup> Unregulated inflow adjusts for the effects of operations at upstream reservoirs. It is computed by adding the change in storage and the evaporation losses from upstream reservoirs to the observed inflow. Unregulated inflow is used because it provides an inflow time series that is not biased by upstream reservoir operations.

<sup>8</sup> Inflow statistics throughout this document will be compared to the mean of the 30-year period 1981-2010, unless otherwise noted.

<sup>9</sup> Precipitation statistics throughout this document are provided by the National Weather Service's Colorado Basin River Forecast Center and are based on the mean for the 30-year period 1981-2010, unless otherwise noted.

<sup>10</sup> Snowpack and snow water equivalent statistics throughout this document are provided by the Natural Resources Conservation Service and are based on the median for the 30-year period 1981-2010, unless otherwise noted.

<sup>11</sup> The basis for the long-term average of tributary inflows in the Lower Basin is natural flow data from 1981 to 2010. Additional information regarding natural flows may be found at <http://www.usbr.gov/lc/region/g4000/NaturalFlow/current.html>.

<sup>12</sup> Tributary inflow from the Gila River to the mainstream is very sporadic. These flows occur very seldom and when they do they are typically of high magnitude.

0.047 maf. Reservoir storage in Lake Mead decreased during water year 2015 by 0.267 maf. At the beginning of water year 2015 (October 1, 2014), Colorado River total system storage was 50 percent of capacity. As of September 30, 2015, total system storage was 51 percent of capacity.

Table 8 lists the October 1, 2015, reservoir vacant space, live storage, water elevation, percent of capacity, change in storage, and change in water elevation during water year 2015.

**Table 8**  
**Reservoir Conditions on October 1, 2015**

<b>Reservoir</b>	<b>Vacant Space</b>	<b>Live Storage</b>	<b>Water Elevation</b>	<b>Percent of Capacity</b>	<b>Change in Storage*</b>	<b>Change in Elevation*</b>
	(maf)	(maf)	(ft)	(%)	(maf)	(ft)
Fontenelle	0.091	0.25	6,493.9	74	-0.060	-8.2
Flaming Gorge	0.300	3.45	6,032.6	92	0.166	4.3
Blue Mesa	0.103	0.73	7,507.7	88	0.126	15.4
Navajo	0.303	1.39	6,063.4	82	0.311	26.4
Lake Powell	11.99	12.33	3,606.0	51	0.047	0.5
Lake Mead	16.27	9.85	1,078.1	38	-0.267	-3.2
Lake Mohave	0.204	1.61	639.6	89	-0.039	-1.5
Lake Havasu	0.039	0.58	448.0	94	-0.003	-0.1
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<b>Totals</b>	<b>29.3</b>	<b>30.2</b>		<b>51</b>	<b>0.281</b>	

\*From October 1, 2014, to September 30, 2015.

## 2. 2016 Water Supply Assumptions

For 2016 operations, three reservoir unregulated inflow scenarios were developed and analyzed: minimum probable, most probable, and maximum probable.

There is considerable uncertainty associated with streamflow forecasts and projections of reservoir operations made a year in advance. The National Weather Service's Colorado Basin River Forecast Center (CBRFC) forecasts the inflow for the minimum probable (90 percent exceedance), most probable (50 percent exceedance), and maximum probable (10 percent exceedance) inflow scenarios for 2016 using an Ensemble Streamflow Prediction model. Based upon the August CBRFC forecast, the range of unregulated inflows is projected to be as follows:

- The forecasted minimum probable unregulated inflow to Lake Powell in water year 2016 is 6.40 maf, or 59 percent of average.
- The forecasted most probable unregulated inflow to Lake Powell in water year 2016 is 9.54 maf, or 88 percent of average.

- The forecasted maximum probable unregulated inflow to Lake Powell in water year 2016 is 16.90 maf, or 156 percent of average.

Projected unregulated inflow volumes into Lake Powell for specific time periods for these three forecasted inflow scenarios are shown in Table 9.

Inflows to the mainstream from Lake Powell to Lake Mead, Lake Mead to Lake Mohave, Lake Mohave to Lake Havasu, and below Lake Havasu are projected using historic data over the five-year period of January 2010 through December 2014, inclusive. These five years of historic data are representative of the most recent hydrologic conditions in the Lower Basin. The most probable side inflows into each reach are estimated as the arithmetic mean of the five-year record. The maximum probable and minimum probable projections for each reach are the 10 percent and 90 percent exceedance values, respectively, of the five-year record. For the reach from Lake Powell to Lake Mead, the minimum probable inflow during water year 2016 is 0.682 maf, the most probable inflow is 0.874 maf, and the maximum probable inflow is 1.09 maf.

The projected monthly volumes of inflow were input into the 24-Month Study and used to project potential reservoir operations for 2016. Starting with the August 2015 24-Month Study projection of the October 1, 2015, reservoir storage conditions, the projected monthly releases for each reservoir were adjusted until release and storage levels best accomplished project purposes and applicable operational objectives.

For the latest monthly projections for the major reservoirs in the Colorado River system, please see the most recent 24-Month Study report available on these Reclamation websites:

<http://www.usbr.gov/uc/water/crsp/studies/index.html>, or <http://www.usbr.gov/lc/region/g4000/24mo/index.html>.

**Table 9**  
**Projected Unregulated Inflow into Lake Powell**  
**for Water Year 2016<sup>13</sup>**

Time Period	Minimum Probable (maf)	Most Probable (maf)	Maximum Probable (maf)
10/2015 – 12/2015	1.30	1.18	1.50
1/2016 – 3/2016	1.38	1.18	1.75
4/2016 – 7/2016	3.33	6.48	12.16
8/2016 – 9/2016	0.387	0.700	1.49
10/2016 – 12/2016	1.10	1.25	1.73
WY 2016	6.40	9.54	16.90
CY 2016	6.20	9.61	17.13

<sup>13</sup> All values in Table 5 are projected inflows based upon the August CBRFC forecast with the exception of the values for 10/15-12/15. The values for 10/15-12/15 are based upon average unregulated inflow from 1981-2010. The calendar year totals in Table 5 also reflect average values for the 10/15-12/15 time period.

### **3. Summary of Reservoir Operations in 2015 and Projected 2016 Water Operations**

The operation of the Colorado River reservoirs has affected some aquatic and riparian resources. Controlled releases from dams have modified temperature, sediment load, and flow patterns, resulting in increased productivity of some riparian and non-native aquatic resources and the development of economically significant sport fisheries. However, these same releases have detrimental effects on endangered and other native species. Operating strategies designed to protect and enhance aquatic and riparian resources have been established after appropriate National Environmental Policy Act compliance at several locations in the Colorado River Basin.

In the Upper Basin, public stakeholder work groups have been established at Fontenelle Dam, Flaming Gorge Dam, the Aspinall Unit, and Navajo Dam. These work groups provide a public forum for dissemination of information regarding ongoing and projected reservoir operations throughout the year and allow stakeholders the opportunity to provide information and feedback with respect to ongoing reservoir operations. Additionally, the Glen Canyon Dam Adaptive Management Work Group (AMWG)<sup>14</sup> was established in 1997 as a chartered committee under the Federal Advisory Committee Act of 1972 (Public Law 92-463).

Modifications to projected operations are routinely made based on changes in forecasted conditions or other relevant factors. Within the parameters set forth in the Law of the River and consistent with the Upper Colorado River Endangered Fish Recovery Program (UCRIP),<sup>15</sup> the San Juan River Basin Recovery Implementation Program (SJRIP),<sup>16</sup> Section 7 consultations under the Endangered Species Act, and other downstream concerns, modifications to projected monthly operations may be based on other factors in addition to changes in streamflow forecasts. Decisions on spring peak releases and downstream habitat target flows may be made midway through the runoff season. Reclamation will conduct meetings with Recovery Program participants, the U.S. Fish and Wildlife Service (Service), other Federal agencies, representatives of the Basin States, and with public stakeholder work groups to facilitate the discussions necessary to finalize site-specific projected operations.

The following paragraphs discuss reservoir operations in 2015 and the range of probable projected 2016 operations of each of the reservoirs with respect to applicable provisions of compacts, the Consolidated Decree, statutes, regulations, contracts, and instream flow needs for maintaining or improving aquatic and riparian resources where appropriate.

#### **a. Fontenelle Reservoir**

Fontenelle Reservoir experienced an overall decrease in storage during water year 2015. The reservoir began water year 2015 with 0.314 maf in storage, which is 91 percent of live capacity and corresponds to an elevation of 6,502.07 feet. The end of water year 2015 reservoir elevation was 6,493.88 feet with 0.254 maf in storage, which is 74 percent of live capacity.

Hydrologic conditions in the Upper Green River Basin were near average in water year 2015. Snowpack development tracked above average through February due to early season storms in November and December, but precipitation was well below average in the subsequent snow accumulation months from January through April. Melt began several

<sup>14</sup> Information on the AMWG can be found at [www.usbr.gov/uc/rm/amp](http://www.usbr.gov/uc/rm/amp).

<sup>15</sup> Information on the UCRIP can be found at <http://coloradoriverrecovery.org>.

<sup>16</sup> Information on the San Juan Recovery Program can be found at [www.fws.gov/southwest/sjrip](http://www.fws.gov/southwest/sjrip).

weeks earlier than usual due to exceptionally warm winter and spring temperatures. Peak snow water equivalent reached 98 percent of seasonal median on March 27, 2015. The April forecast for the April through July inflow to Fontenelle Reservoir was 0.580 maf, or 80 percent of average. The observed inflow during the April to July season was 0.767 maf, or 106 percent of average. Due to unexpected and significantly above average precipitation in May, the resulting April through July runoff was much greater than anticipated in April.

Fontenelle Reservoir filled in water year 2015. The reservoir elevation peaked at 6,505.54 feet on June 18, 2015, which was 0.46 feet below the spillway crest. Inflow peaked at 7,520 cfs on June 13, 2015. Reservoir releases were made to balance downstream water resources needs and power production, while also allowing for filling the reservoir to maintain sufficient water in storage for use through the fall and winter months. Releases peaked at 7,030 cfs during June and were reduced to 1,020 cfs in September.

Based on the August 2015 24-Month Study, the most probable April through July inflow scenario for Fontenelle Reservoir during water year 2016 is 0.663 maf, or 91 percent of average. This volume far exceeds the 0.345 maf storage capacity of Fontenelle Reservoir. For this reason, the most probable and maximum probable inflow scenarios would require releases during the spring that exceed the capacity of the powerplant to avoid uncontrolled spills from the reservoir. It is likely that Fontenelle Reservoir will fill during water year 2016. In order to minimize high spring releases and to maximize downstream water resources and power production, the reservoir will most likely be drawn down to about elevation 6,468.00 feet by early April 2016, which is 5.00 feet above the minimum operating level for power generation, and corresponds to a volume of 0.111 maf of live storage.

## **b. Flaming Gorge Reservoir**

Flaming Gorge Reservoir experienced an overall increase in storage during water year 2015. The reservoir began water year 2015 with 3.28 maf of live storage, which is 88 percent of live capacity and corresponds to an elevation of 6,028.31 feet. Inflow to Flaming Gorge Reservoir during water year 2015 was near average. Unregulated inflow in water year 2015 was 1.56 maf, which is 108 percent of average. The end of water year reservoir elevation was 6,032.59 feet corresponding to a volume of 3.45 maf and 7.41 feet below the full pool elevation (6,040.00 feet), which corresponded to an available storage space of 0.302 maf.

Flaming Gorge Dam operations in 2015 were in compliance with the 2006 Flaming Gorge ROD. Reclamation convened the Flaming Gorge Technical Working Group (FGTWG) comprised of Service, Western, and Reclamation personnel. The FGTWG proposed that Reclamation manage releases to the Green River to meet the commitments of the ROD and, to the extent possible, meet the experimental design parameters outlined in the UCRIP Larval Trigger Study Plan (LTSP).<sup>17</sup> Larvae were detected on May 7, 2015 and releases from Flaming Gorge were increased to full powerplant capacity and additional bypass on May 11, 2015 (in combination, the peak release was approximately 7,500 cfs) for a total of seven days. Yampa River flows at the Deerlodge gage peaked twice during the spring runoff season, at 9,630 cfs on May 9, 2015 and at 10,100 cfs on June 4, 2015. The second peak resulted from increased precipitation in the basin during May. The peak release from Flaming Gorge occurred during a decline in the hydrograph prior to the second peak in Yampa River flows at Deerlodge. Deerlodge flows were less than or equal to 6,000 cfs when Flaming Gorge releases were at powerplant capacity with additional bypass in support of the LTSP.

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<sup>17</sup> The LTSP's primary objective is to determine the effects of timing of Flaming Gorge spring release on razorback sucker larvae in the reach below the confluence of the Green and Yampa Rivers. The LTSP Report is available online at <http://www.usbr.gov/uc/water/crsp/wg/fg/twg/twgSummaries.html>.



The hydrologic conditions during spring 2015 consisted of above average snow accumulation beginning in December 2014 and continuing through February 2015. Snow water equivalent peaked on March 4, 2015 at 102 percent of average with deteriorating hydrologic conditions persisting through May. The May final forecast for the April through July unregulated inflow volume into Flaming Gorge Reservoir was 58 percent of average. Yampa River spring peak flows were much below average. The ROD hydrologic classification for the Upper Green was moderately dry. Yampa River conditions were dry. Flaming Gorge operations included the flexibility outlined in the ROD and the dry Yampa River conditions resulted in the operating hydrologic classification being decreased to dry rather than moderately dry. The May and June precipitation increased the hydrological classification to moderately dry. Releases from Flaming Gorge Dam remained at an average daily release of 1,000 cfs through May 10, 2015, when releases were increased to meet the LTSP request. After releases for the LTSP concluded, releases were decreased to base flow releases of 1,700 cfs. Flows at Jensen met or exceeded ROD targets in Reach 2 for the ROD Flow Recommendation of at least one week peak duration at 8,300 cfs and the LTSP moderately dry target of 8,300 cfs for seven days, all of which occurred during larval drift.

Consistent with the ROD, considering information provided to the FGTTWG, dry hydrologic conditions and in response to the Service's request, Reclamation operated Flaming Gorge Dam to produce flows in Reach 2 to assist in the recovery of Colorado Pikeminnow during the summer of 2015. The ROD base flow period hydrologic classification was moderately dry as of August 2015. Daily base flows fluctuated during the summer to meet or exceed 1,900 cfs on the Green River at Jensen, Utah through October 31, 2015.

During water year 2016, Flaming Gorge Dam will continue to be operated in accordance with the ROD. Under the most probable inflow scenario, winter base flow releases are projected to be in the average classification range with a 25 percent increase above the average daily base flows calculated through the base flow period. Winter releases are projected to be approximately 2,200 cfs. Daily base flows will likely fluctuate during the winter in response to hydropower needs during November through February and meet the average-year reservoir upper level drawdown elevation target of 6,027.00 feet by May 1, 2016. A spring peak release is projected to occur sometime in May or June 2016, and will be timed to coincide with either the peak flows of the Yampa River or emergence of razorback sucker larvae. Reclamation is considering long-term implementation strategies for the Recovery Program LTSP.

The UCRIP, in coordination with Reclamation, the Service, and Western, will continue conducting studies associated with floodplain inundation. Such studies may result in alternatives for meeting flow and temperature recommendations at lower peak flow levels where feasible.<sup>18</sup>

### **c. Blue Mesa, Morrow Point, and Crystal Reservoirs (Aspinall Unit)**

Blue Mesa Reservoir experienced an increase in storage in water year 2015. At the beginning of water year 2015 (October 1, 2014), the elevation of Blue Mesa was 7,492.28 feet, and the storage content was 0.599 maf, which was 72 percent of capacity. At the end of water year 2015, the reservoir elevation was 7,507.65 feet with 0.726 maf in storage, which is 87 percent of live capacity.

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<sup>18</sup> Flow and Temperature Recommendations for Endangered Fishes in the Green River Downstream of Flaming Gorge Dam, September 2000. Available online at [http://ulpeis.anl.gov/documents/dpeis/references/pdfs/Muth\\_et\\_al\\_2000.pdf](http://ulpeis.anl.gov/documents/dpeis/references/pdfs/Muth_et_al_2000.pdf).

Below average snowpack conditions prevailed in the Gunnison River Basin during water year 2015. Snow measurement sites in the basin reported below average seasonal snow water equivalent levels throughout the winter and into the spring of 2015. On April 1, 2015, the snow water equivalent for the Gunnison River Basin was 63 percent of average.

The April forecast for the April through July unregulated inflow above Blue Mesa was 0.480 maf, which was 71 percent of average. The actual April through July unregulated inflow into Blue Mesa Reservoir in 2015 was 0.708 maf, which was 105 percent of average.

The fall through winter release from Crystal Dam varied between approximately 350 cfs and 1,100 cfs from October 31, 2014, through March 2015. On March 31, 2015, releases from Crystal Dam were increased for operation of Gunnison Tunnel. Flows through the Black Canyon were approximately 350 cfs. Releases from the Aspinall Unit pursuant to the ROD reached over 2,000 cfs for 1 day. Flows under the ROD operations equaled or exceeded the flow rates in the Black Canyon Water Right Decree.<sup>19</sup> Flows through the Black Canyon and Gunnison River Gorge reached higher levels later during the runoff season due to unexpected wet hydrology with peak flows of 7,100 cfs for 5 days during June.

During water year 2015, the peak elevation of Blue Mesa Reservoir occurred on June 20, 2015 at an elevation of 7,519.40 feet, which was at the full pool elevation. Storage in Blue Mesa Reservoir increased during water year 2015 by 0.127 maf. Total unregulated inflow into Blue Mesa Reservoir for water year 2015 was 1.04 maf, or 109 percent of average.

On May 3, 2012, Reclamation signed a ROD for the operation of the Aspinall Unit. For water year 2016, the Aspinall Unit will be operated in accordance with the 2012 ROD, including required consultations, while maintaining and continuing to meet its Congressionally-authorized purposes.

The projected most probable unregulated inflow for water year 2016 into Blue Mesa Reservoir is 0.880 maf, or 92 percent of average. The reservoir is expected to decrease to a seasonal low elevation of 7,482.31 feet by February 2016. The peak elevation is expected to be approximately 7,516.40 feet near the end of July 2016. By the end of water year 2016, Blue Mesa Reservoir is projected to be at elevation 7,499.75 feet, with a storage of 0.659 maf, or 79 percent of capacity.

#### **d. Navajo Reservoir**

Navajo Reservoir experienced an overall increase in storage in water year 2015. At the beginning of the 2015 water year, Navajo Reservoir was at an elevation of 6,036.99 feet, which was 65 percent of live capacity and corresponded to a live storage content of 1.08 maf. Snowpack conditions in the San Juan River Basin were persistently below average during the winter months. On April 1, 2015, the snow water equivalent in the San Juan River Basin above Navajo Reservoir was 47 percent of the seasonal average for the basin.

Inflow to Navajo Reservoir in water year 2015 was below average. Water year 2015 modified unregulated inflow<sup>20</sup> to Navajo Reservoir was 0.903 maf, or 84 percent of average. The April through July modified unregulated inflow into Navajo Reservoir in water year 2015 was 0.619 maf, or 84 percent of average.

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<sup>19</sup> Decree quantifying the Federal Reserved Water Right for Black Canyon of the Gunnison National Park (State of Colorado District Court, Water Division Four, Case Number 01CW05), signed on January 8, 2009.

<sup>20</sup> Modified Unregulated inflow into Navajo Reservoir is equivalent to unregulated inflow adjusted for trans-basin diversion through the San Juan-Chama Project.

Navajo Reservoir reached a peak water surface elevation of 6,069.60 feet on July 20, 2015, which was 15.40 feet below full pool. The water surface elevation at Navajo Reservoir on September 30, 2015, was 6,063.41 feet, with a reservoir storage volume of 1.39 maf, or 82 percent of capacity.

The San Juan Flow Recommendations,<sup>21</sup> completed by the SJRIP in May 1999, provide flow recommendations that promote the recovery of the endangered Colorado pikeminnow and razorback sucker, maintain important habitat for these two species as well as the other native species, and provide information for the evaluation of continued water development in the basin. The flow recommendations are scheduled to be reviewed by the SJRIP in fiscal year 2016.

In 2006, Reclamation completed a National Environmental Policy Act process on the implementation of operations at Navajo Dam. The ROD for the Navajo Reservoir Operations Final EIS (Navajo Reservoir ROD)<sup>22</sup> was signed by the Regional Director of Reclamation's Upper Colorado Region on July 31, 2006.

In water year 2015, Navajo Reservoir operated under the SJRIP and Reclamation's interim operations. Interim operations were discussed and adopted for water year 2015 at the SJRIP workshop held February 12-13, 2015. Under the interim operations, releases for SJRIP recovery purposes are dependent on annual hydrology and available water may be released as a spring peak release, an augmentation of existing target base flows, or some other SJRIP purposes. The interim operations specify an End of Water Year Storage Target equal to elevation 6,063.00 feet with a provision to decrease to 6,050.00 feet should the SJRIP and Reclamation determine additional releases are needed.

In response to the Gold King mine spill in the headwaters of the Animas River, Reclamation collaborated with the SJRIP to shift the timing of Navajo Reservoir releases to aid in dilution of the contaminant for the benefit of the endangered species in the San Juan River. Releases were increased from 650 cfs to 1,300 cfs on August 7-9, 2015 and reduced back to 650 cfs on August 10, 2015. This did not affect Navajo Reservoir total releases in water year 2015.

Navajo Reservoir was operated in compliance with the Navajo Reservoir ROD in 2015, including the SJRIP's target base flows. Based on the SJRIP and Reclamation's interim operations for water year 2015, there was no spring peak release in water year 2015.

In 2012, a four-year agreement on recommendations for San Juan River operations and administration was developed among major users to limit their water use in years 2013-2016, to the rates and volumes indicated in the agreement.<sup>23</sup> The agreement includes limitations on diversions for 2013-2016, criteria for determining a shortage, and shortage-sharing requirements in the event of a water supply shortfall, including sharing of shortages between the water users and the flows for endangered fish habitat.

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<sup>21</sup> Flow Recommendations for the San Juan River, May 1999. Available online at [http://www.fws.gov/southwest/sjrip/pdf/DOC\\_Flow\\_recommendations\\_San\\_Juan\\_River.pdf](http://www.fws.gov/southwest/sjrip/pdf/DOC_Flow_recommendations_San_Juan_River.pdf).

<sup>22</sup> Record of Decision for the Navajo Reservoir Operations, Navajo Unit –San Juan River, New Mexico, Colorado, Utah Final Environmental Impact Statement. Available online at <http://www.usbr.gov/uc/envdocs/eis/navajo/pdfs/NavWaterOpsROD2006.pdf>.

<sup>23</sup> Recommendations for San Juan River Operations and Administration for 2013-2016, July 2, 2012. Available online at [http://www.fws.gov/southwest/sjrip/DR\\_SS03.cfm](http://www.fws.gov/southwest/sjrip/DR_SS03.cfm).

During water year 2016, Navajo Reservoir will be operated in accordance with the Navajo Reservoir ROD. Navajo Reservoir storage levels are expected to be near average in 2016 under the most probable inflow forecast. Base releases from the reservoir will likely range from 350 cfs to 500 cfs through the winter. Under the most probable April through July modified unregulated inflow forecast of 0.682 maf in 2016, a three-week spring peak release would be recommended by the anticipated SJRIP and Reclamation's interim operations for water year 2016. The reservoir is projected to reach a peak elevation of 6,074.38 feet in May 2016. The reservoir is projected to reach a minimum elevation of 6,059.77 feet in February 2016.

Under the minimum probable 2016 April through July inflow forecast of 0.287 maf, there will not be a spring peak release made during the spring of 2016. Under the maximum probable 2016 April through July inflow forecast of 1.14 maf, a full spring peak release will be recommended as described by the anticipated SJRIP and Reclamation's interim operations for water year 2016.

#### **e. Lake Powell**

Reservoir storage in Lake Powell increased during water year 2015. On October 1, 2014, the beginning of water year 2015, reservoir storage in Lake Powell was 51 percent of capacity at elevation 3,605.53 feet, with 12.29 maf in storage. On September 30, 2015, the reservoir storage in Lake Powell was 12.33 maf at 51 percent of full capacity, resulting in a net gain during water year 2015 of 0.047 maf. The unregulated inflow to Lake Powell during water year 2015 was 94 percent of average. Lake Powell ended the water year on September 30, 2015, at elevation 3,606.01 feet.

The August 2014 24-Month Study was run to project the January 1, 2015, elevations of Lake Powell and Lake Mead and determine the water year 2015 operating tier for Lake Powell. Using the most probable inflow scenario, and with an 8.23 maf annual release pattern for Lake Powell, the January 1, 2015, reservoir elevations of Lake Powell and Lake Mead were projected to be 3,596.62 feet and 1,083.37 feet, respectively. Given these projections, the annual release volume from Lake Powell during water year 2015 was consistent with the Upper Elevation Balancing Tier (Section 6.B of the 2007 Interim Guidelines) and under Section 6.B.1, the annual release would be 8.23 maf.

The Upper Elevation Balancing Tier, however, does provide for the possibility of adjustments to the operation of Lake Powell based on the projected end of water year condition of Lake Powell and Lake Mead from the April 24-Month Study. The April 2015 24-Month Study was run with an 8.23 maf annual release volume to project the September 30, 2015, elevations of Lake Powell and Lake Mead. Under the most probable inflow scenario, and with an 8.23 maf annual release volume, the projected end of water year elevation at Lake Powell was 3,591.34 feet and Lake Mead was 1,066.05 feet. Since the projected end of water year elevation at Lake Powell was below the 2015 Equalization elevation of 3,649.00 feet and above 3,575.00 feet and the projected Lake Mead elevation was below 1,075.00 feet, Section 6.B.4 of the 2007 Interim Guidelines governed for the remainder of water year 2015. Under Section 6.B.4, the Secretary shall balance the contents of Lake Mead and Lake Powell, but shall release not more than 9.00 maf and not less than 8.23 maf from Lake Powell. The annual release volume during water year 2015 was 9.00 maf.

The April through July unregulated inflow to Lake Powell in water year 2015 was 6.71 maf, which was 94 percent of average. Lake Powell reached a peak elevation for water year 2015 of 3,614.32 feet on July 14, 2015, which was 85.68 feet below full pool. This peak elevation corresponds to a live storage content of 13.17 maf.

The third experimental release under the 2012 High-Flow Experimental Protocol (Protocol)<sup>24</sup> was conducted during November 2014. Reclamation made releases at the maximum available capacity (38,000 cfs) during the experiment, which began on November 10 and ended on November 15, 2014. The release at its maximum capacity consisted of approximately 23,000 cfs through the turbines and 15,000 cfs through the bypass tubes. Approximately 0.132 maf was bypassed during the experiment. The total annual release from Glen Canyon Dam in water year 2015 did not change as a result of the High-Flow Experiment.

The ten-year total flow of the Colorado River at Lee Ferry<sup>25</sup> for water years 2006 through 2015 is 90.30 maf. This total is computed as the sum of the flow of the Colorado River at Lees Ferry, Arizona, and the Paria River at Lees Ferry, Arizona, surface water discharge stations which are operated and maintained by the United States Geological Survey.

#### **(i). 2016 Operating Tier and Projected Operations for Glen Canyon Dam**

The January 1, 2016, reservoir elevations of Lake Powell and Lake Mead are projected under the most probable inflow scenario to be 3,602.46 feet and 1,082.33 feet, respectively, based on the August 2015 24-Month Study. Given these projections, the operating tier and annual release volume from Lake Powell during water year 2016 will be consistent with the Upper Elevation Balancing Tier (Section 6.B of the 2007 Interim Guidelines) and, under Section 6.B.1, the annual release would be 8.23 maf. The Upper Elevation Balancing Tier, however, does provide for the possibility of adjustments to the operation of Lake Powell based on the projected end of water year conditions of Lake Powell and Lake Mead from the April 24-Month Study.

If the April 2016 24-Month Study, with a water year release volume of 8.23 maf projects the September 30, 2016, Lake Powell elevation to be greater than 3,651.00 feet, operations will be adjusted and the Equalization Tier will govern the operation of Lake Powell for the remainder of the water year consistent with Section 6.B.3. If this condition occurs, and an adjustment is made, the water year release volume will likely be greater than 8.23 maf and will be determined based on the Equalization Tier as described in Section 6.A of the 2007 Interim Guidelines.

If the April 2016 24-Month Study, with a water year release volume of 8.23 maf, projects the September 30, 2016, Lake Powell elevation to be at or above 3,575.00 feet and below the 2016 Equalization level of 3,651 feet, and the September 30, 2016, Lake Mead elevation to be below 1,075.00 feet, the Secretary shall balance the contents of Lake Mead and Lake Powell, but shall release not more than 9.00 maf and not less than 8.23 maf from Lake Powell in water year 2016 consistent with Section 6.B.4 of the 2007 Interim Guidelines.

Under the minimum probable inflow scenario, the August 2015 24-Month Study, with a projected water year release volume of 8.23 maf in water year 2016, projects the elevations of Lake Powell and Lake Mead on September 30, 2016, would be 3,592.70 feet and 1,063.75 feet, respectively. Based on these projections, an April adjustment to balancing is projected to govern Lake Powell operations under the minimum probable inflow scenario and the water

<sup>24</sup> Finding of No Significant Impact for the Environmental Assessment for Development and Implementation of a Protocol for High-Flow Experimental Releases from Glen Canyon Dam, Arizona through 2020. Available online at <http://www.usbr.gov/uc/envdocs/ea/gc/HFEPProtocol/index.html>.

<sup>25</sup> A point in the mainstream of the Colorado River one mile below the mouth of the Paria River.

year release for 2016 is projected to be 9.00 maf. The end of water year elevation and storage of Lake Powell is projected to be 3,584.83 feet and 10.36 maf, respectively, based on the minimum probable inflow scenario.

Under the most probable inflow scenario, the August 2015 24-Month Study, with a projected water year release volume of 8.23 maf in water year 2016, projects the elevations of Lake Powell and Lake Mead on September 30, 2016, would be 3,616.69 feet and 1,066.02 feet, respectively. Based on these projections, under the most probable inflow scenario, an April adjustment to balancing is projected to occur during water year 2016. Consistent with Section 6.B.4, the 2016 water year release volume projected under the most probable inflow scenario is 9.00 maf and the end of water year elevation and storage of Lake Powell is projected to be 3,609.78 feet and 12.71 maf, respectively.

Under the maximum probable inflow scenario, the August 2015 24-Month Study, with a projected water year release volume of 8.23 maf in water year 2016, projects the elevation of Lake Powell on September 30, 2016, would be 3,670.52 feet. This elevation is above the Equalization Level for water year 2016 of 3,651.00 feet. Based on this projection, an April adjustment to equalization is projected to occur under the maximum probable inflow scenario and the water year release for 2016 is projected to be 11.43 maf. The end of water year elevation and storage of Lake Powell is projected to be 3,648.10 feet and 16.98 maf, respectively, based on the maximum probable inflow scenario.

In 2016, scheduled maintenance activities at Glen Canyon Dam powerplant will require that one or more of the eight generating units periodically be offline. Coordination between Reclamation offices in Salt Lake City, Utah, and Page, Arizona, and Western will take place in the scheduling of maintenance activities to minimize impacts to operations throughout the water year including experimental releases.

Because of less than full storage conditions in Lake Powell resulting from drought in the Colorado River Basin, releases from Glen Canyon Dam for dam safety purposes are highly unlikely in 2016. If implemented, releases greater than powerplant capacity would be made consistent with the 1956 Colorado River Storage Project Act,<sup>26</sup> the CRBPA, and to the extent practicable, the recommendations made pursuant to the Grand Canyon Protection Act of 1992. Reservoir releases in excess of powerplant capacity required for dam safety purposes during high reservoir conditions may be used to accomplish the objectives of the beach/habitat-building flow according to the terms contained in the 1996 Glen Canyon Dam ROD and as published in the 1997 Glen Canyon Dam Operating Criteria (*Federal Register*, Volume 62, No. 41, March 3, 1997).<sup>27</sup>

Releases from Lake Powell in water year 2016 will continue to reflect consideration of the uses and purposes identified in the authorizing legislation for Glen Canyon Dam. Releases will reflect criteria based on the findings, conclusions, and recommendations made in the 1996 Glen Canyon Dam ROD for the Glen Canyon Dam Final Environmental Impact Statement (GCDFEIS) (consistent with the Grand Canyon Protection Act of 1992) and applicable Secretarial decisions.

Monthly releases are updated to be consistent with annual volumes determined pursuant to the 2007 Interim Guidelines. Monthly releases for 2016 will also be consistent with the GCDFEIS/ROD.

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<sup>26</sup> Available online at <http://www.usbr.gov/lc/region/pao/pdfiles/crspuc.pdf>.

<sup>27</sup> Available online at <http://www.gpo.gov/fdsys/pkg/FR-1997-03-03/pdf/97-5144.pdf>.



For the latest monthly projections for Lake Powell, please see the most recent 24-Month Study report available on Reclamation's Upper Colorado Region Water Operations website: <http://www.usbr.gov/uc/water/crsp/studies/index.html>.

Daily and hourly releases in 2016 will be made according to the parameters of the 1996 Glen Canyon Dam ROD for the GCD FEIS and the 1997 Glen Canyon Dam Operating Criteria. These parameters set the maximum and minimum flows and ramp rates within which reservoir releases must be made. Exceptions to these parameters will be made in accordance with the Emergency Exception Criteria as described in the 1997 Glen Canyon Dam Operating Criteria.

Following a decision to not implement a high-flow experimental release from Glen Canyon Dam in November 2015 due to concerns with the potential to further distribute non-native fish species, the Department of the Interior will conduct planning for high-flow experimental releases from Glen Canyon Dam in March-April 2016 in accordance with the Protocol, pending confirmation that the non-native fish issue has been resolved.

## **I. FISH AND WILDLIFE**

During the 1960s and 1970s, growing public concern over the environment resulted in new federal environmental laws. The enactment of the Colorado River Basin Project Act of 1968, National Environmental Policy Act of 1969, Endangered Species Act of 1973, and Grand Canyon Protection Act of 1992 has resulted in new compliance requirements as well as authorization in some cases for CRSP units to modify operations for fish and wildlife and other environmental protection purposes. Additionally, the Reclamation Projects Authorization and Adjustment Act, signed October 30 1992 (P.L. 102-575), was authorized to protect, restore, and enhance wetland and upland ecosystems for the conservation of fish and wildlife resources in the Upper Colorado River Basin, including Utah fish and wildlife resources adversely affected by construction and operation of the CRSP.

Since its inception in 1956, the CRSP has grown to include the participation of two significant endangered fish recovery programs: the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program.

The Upper Colorado Recovery Program, established in 1988, is a cooperative effort among the states of Colorado, New Mexico, Utah, and Wyoming; representatives from the water development, hydroelectric consumer, and environmental communities; and affected federal agencies including the Bureau of Reclamation, National Park Service, U.S. Fish and Wildlife Service, and Western Area Power Administration. The intent of the program is to recover the endangered Colorado River fish species (humpback chub, bonytail, Colorado pikeminnow, and razorback sucker) while the states continue to develop their Colorado River Compact entitlements. With its demonstrated successes, the Upper Colorado Recovery Program has become a national model for its collaborative conservation efforts to protect endangered species.

The San Juan Recovery Program, established in 1992, is ongoing in the San Juan River Basin with participation from the states of Colorado and New Mexico; four Native American tribes and nations including the Jicarilla Apache, Navajo, Southern Ute Indian, and Ute Mountain Ute Indian; and affected federal agencies including the Bureau of Indian Affairs,

Bureau of Land Management, Bureau of Reclamation, and U.S. Fish and Wildlife Service. The goal of the San Juan Recovery Program is to protect and recover the native fish communities in the San Juan River while providing for continued water development consistent with state and federal laws.

As a result of activities being conducted by both the Upper Colorado and San Juan Recovery Programs, aggressive efforts are being made to stock sufficient numbers of Colorado pikeminnow, razorback sucker, and bonytail to provide the basis for self-sustaining populations that lead to down-listing and de-listing of the species. Capital projects constructed include fish ladders, fish screens, hatcheries, levee breeches, storage reservoirs, and irrigation system upgrades. In addition, existing CRSP storage facilities are now being re-operated to enhance natural flow regimes. To date, the two Recovery Programs have served as the reasonable and prudent alternative for many water projects depleting more than three million acre-feet of water annually while avoiding Endangered Species Act related litigation.

On January 1, 2013, Congress passed legislation (H.R. 6060) that reauthorized federal funding for both the Upper Colorado and San Juan Recovery Programs. Reauthorization of the Programs means federal funding will continue through 2019. The Endangered Fish Recovery Programs Extension Act of 2012 (Public Law 112-672) was signed by the President on January 14, 2013.

## **J. APPROPRIATIONS OF FUNDS BY THE UNITED STATES CONGRESS**

The funds appropriated<sup>28</sup> for fiscal year 2015 for construction of the CRSP and participating projects and recreational and fish and wildlife activities totaled \$83,778,000. Recreational and fish and wildlife activities received a total of \$3,408,000.

In fiscal year 2015, Reclamation expended \$9,477,000 in appropriations in its Colorado River Basinwide Salinity Program. The Natural Resources Conservation Service expended \$15,226,488 in appropriations in its Colorado River Basin Salinity Control Program.

Table 10 is a summary of action by the 113th Congress pertaining to approval of funds for the construction program of the CRSP and participating projects and recreational and fish and wildlife activities.

Table 11 shows the total funds (rounded to the nearest \$1,000) approved by the United States Congress for the CRSP and participating projects and chargeable against the limitations of various authorizing Acts (P.L. 485, 84th Congress, CRSP Act, as amended in 1972 by P.L. 32-370 and in 1988 by P.L. 100-563; P.L. 87-485, San Juan-Chama and Navajo Indian Irrigation Projects Act; P.L. 88-568, Savery-Pot Hook, Bostwick Park, and Fruitland Mesa Projects Act; and P.L. 90-537, Colorado River Basin Project

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<sup>28</sup>

Approved by Congress minus rescissions.

**Table 10**  
**Colorado River Storage Project**  
**Fiscal Year 2015 Program**

<b>Project</b>	<b>Budget Request</b>	<b>House Allowance</b>	<b>Senate Allowance</b>	<b>H.R. 83 Dec 16, 2014</b>
Construction Program				
CRSP Participating Projects				
Initial Units, CRSP	\$30,000	\$0	\$0	\$30,000
Navajo-Gallup Water Supply	<u>80,340,000</u>	<u>0</u>	<u>0</u>	<u>80,340,000</u>
TOTAL – Upper Colorado River Basin Fund	\$80,370,000	\$0	\$0	\$80,370,000
Recreation and Fish and Wildlife Facilities				
Recreational Facilities	\$378,000	\$0	\$0	\$378,000
Fish and Wildlife Facilities	<u>3,030,000</u>	<u>0</u>	<u>0</u>	<u>3,030,000</u>
TOTAL – CRSP Section 8	\$3,408,000	\$0	\$0	\$3,408,000
<b>TOTAL – Construction and Section 8</b>	<b>\$83,778,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$83,778,000</b>

**Table 11**  
**Appropriations Approved by Congress for the**  
**Colorado River Storage Project and Participating Projects**<sup>29</sup>

<b><u>Fiscal Year</u></b>	<b><u>Amount</u></b>
1957 .....	\$13,000,000
1958 .....	35,142,000
1959 .....	68,033,000
1960 .....	74,460,000
1961 .....	58,700,000
1962 .....	52,535,000
1963 .....	108,576,000
1964 .....	94,037,000
1965 .....	55,800,000
1966 .....	45,328,000
1967 .....	46,648,000
1968 .....	39,600,000
1969 .....	27,700,000
1970 .....	25,740,000
1971 .....	24,230,000
1972 .....	27,284,000
1973 .....	45,770,000
1974 .....	24,426,000
1975 .....	22,967,000
1976 .....	53,722,000

<sup>29</sup> The information in Table 11 has been prepared in good faith on the basis of information available at the date of publication.

**Table 11 continued**

1977.....	55,200,000
1978.....	67,051,000
1979.....	76,799,000
1980.....	81,502,000
1981.....	125,686,000
1982.....	130,063,000
1983.....	132,942,000
1984.....	161,104,000
1985.....	163,503,000
1986.....	97,412,000
1987.....	110,929,000
1988.....	143,143,000
1989.....	174,005,000
1990.....	163,653,000
1991.....	145,063,000
1992.....	92,093,000
1993.....	69,333,000
1994.....	46,507,000
1995.....	23,272,000
1996.....	27,049,000
1997.....	22,410,000
1998.....	17,565,000
1999.....	4,655,000
2000.....	2,000,000
2001.....	2,000,000
2002.....	16,000,000
2003.....	35,000,000
2004.....	55,640,000
2005.....	57,512,000
2006.....	64,320,000
2007.....	69,815,000
2008.....	65,175,000
2009.....	50,653,000
2010.....	63,144,000
2011.....	25,658,000
2012.....	39,376,000
2013.....	32,740,000
2014.....	71,344,000
2015.....	98,212,000
<b>TOTAL .....</b>	<b>\$3,823,226,000</b>

Plus: Navajo Indian Irrigation Project appropriations  
.....619,312,321  
(funds transferred to Reclamation only)

**TOTAL APPROPRIATIONS ..... \$4,442,538,321**

Exclusive of non-reimbursable funds for fish and wildlife,  
recreation, etc., under Section 8 of Public Law 485, 84th  
Congress, and all under financing and rescission actions.

## **COLORADO RIVER BASIN TITLE II SALINITY CONTROL PROGRAM**

*Information relative to the Colorado River Basin Title II Salinity Control Program in the Colorado River Basin has been provided by the United States Department of the Interior, Bureaus of Reclamation and Land Management, and the United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS).*

Title II of the Colorado River Basin Salinity Control Act, P.L. 93-320 (approved June 24, 1974) (Salinity Control Act), directs the Secretary of the Interior to expedite the investigation, planning, and implementation of the salinity control program. The program objective is to treat salinity as a basinwide problem in order to maintain salinity concentrations at or below 1972 levels in the lower mainstem of the Colorado River while the seven Colorado River Basin states continue to develop their compact apportioned waters. Specifically, the Act authorizes the construction, operation, and maintenance of four salinity control projects (Crystal Geyser, Grand Valley, Las Vegas Wash, and Paradox Valley units) and the expeditious completion of planning reports for 12 other projects. It also requires 25 percent reimbursement of the costs from the Upper Colorado River Basin Fund and Lower Colorado River Basin Development Fund (Basin Funds). The Secretary of the Interior, Secretary of Agriculture, and Administrator of the Environmental Protection Agency are directed to cooperate and coordinate their activities to meet the program objectives.

Public Law 98-569, signed into law on October 30, 1984, amends P.L. 93-320 (Colorado River Basin Salinity Control Act). This law amends the original salinity control program by authorizing construction of additional units by Reclamation and de-authorizing Crystal Geyser because of poor cost effectiveness. The Secretary of Agriculture was directed to establish a major voluntary on-farm cooperative salinity control program. The new units require 30 percent reimbursement of the costs from the Basin Funds. The authorizing legislation provides for cost sharing and technical assistance to participants for planning and installing needed salinity reduction practices, including voluntary replacement of incidental fish and wildlife values foregone. Participants pay a portion of the costs to install salinity reduction and wildlife habitat practices. Public Law 98-569 also directs the Bureau of Land Management (BLM) to develop a comprehensive program for minimizing salt contributions from the 48 million acres of basin lands that it administers.

Public Law 104-20 was signed into law on July 28, 1995. This law amends the 1974 Salinity Control Act to authorize a new approach to salinity control for Reclamation. Past authorities were unit specific. This amendment authorized Reclamation to pursue salinity control anywhere in the Colorado River Basin. The amendment increased Reclamation's appropriation ceiling by \$75,000,000 to continue its ongoing efforts to control salinity.

The Federal Agriculture Improvement and Reform Act of 1996 (P.L. 104-127) was signed into law April 4, 1996. This Act combined the USDA's salinity control program and other programs into the Environmental Quality Incentives Program (EQIP). The Act further amended the 1974 Salinity Control Act to authorize the Secretary of the Interior the option to expend funds available in the Basin Funds to carry out cost-shared salinity measures consistent with the 30 percent reimbursement authorized by P.L. 98-569. This cost-sharing option is available for both USDA and Reclamation programs.

Public Law 106459 was signed into law on November 7, 2000. This law amended the 1974 Salinity Control Act to increase the appropriation ceiling by an additional \$100 million. Public Law 106-459 also requires the BLM to prepare a Report to Congress on the

status of implementation of its comprehensive program for minimizing salt contributions to the Colorado River from lands administered by the BLM as directed by Section 203(b)(3) of P.L. 98-569 (1984).

Public Law 107-171, the Farm Security and Rural Investment Act of 2002, authorized and amended the Environmental Quality Incentives Program that had been added to the Food Security Act of 1985 by P.L. 104-127 (Federal Agricultural Improvement and Reform Act of 1996).

Public Law 110-246, the Food, Conservation, and Energy Act of 2008, signed into law on June 18, 2008, extended the authorization of the Environmental Quality Incentives Program through 2012. Section 2806 of the Act amended P.L. 93-320 and established the Basin States Program. Amounts from the Basin Funds used for cost sharing, not just those associated with the NRCS salinity program, will now be administered through the Basin States Program.

Public Law 113-79, the Agricultural Act of 2014, revised and reauthorized the Environmental Quality Incentives Program through fiscal year 2018. Of note, the 2014 "Farm Bill" also authorized the Regional Conservation Partnership Program including designation of the Colorado River Basin as one of eight critical conservation areas in the nation.

## **A. BUREAU OF RECLAMATION SALINITY CONTROL PROGRAM**

The Bureau of Reclamation's Colorado River Basinwide Salinity Program (Basinwide Program) is currently being implemented under the authorities provided in 1995 by P.L. 104-20. Through this program, agreements have been awarded to various non-federal entities to install their salinity control projects selected through a competitive process. Projects have been ranked based on cost effectiveness and performance risk factors by a committee chaired by the Program Manager along with representatives from the Salinity Control Forum Work Group and Reclamation area offices. Requests for Proposals (RFPs) were issued by Reclamation in 1996, 1997, 1998, 2001, 2004, and 2006.

In 2008, 2010, 2012, and 2015, instead of soliciting proposals through the RFP process, proposals were solicited through a process for financial assistance agreements called Funding Opportunity Announcements (FOA). Another FOA will probably not be needed until fiscal year 2017.

In 2015, \$7.310 million of appropriations was received into Reclamation's Basinwide Program and \$3.133 million was received from the Basin Funds for a total program amount of \$10.443 million. This amount was expended through 12 ongoing salinity control projects located in Colorado, Utah, and Wyoming. It is estimated that the facilities installed with the \$10.443 million will control over 8,600 tons of salt loading each year.

Subsection 208(b) of the 1974 Salinity Control Act authorized the sum of \$125,100,000 to be appropriated for construction of salinity control units. The appropriation ceiling was based on April 1973 prices and the Salinity Control Act provided for indexing of the cost ceiling. Section 208(c) of the Salinity Control Act was amended by the 1995 and 2000 amendments authorizing an additional \$175,000,000 to be appropriated. As of September 30, 2015, Reclamation calculates the appropriation ceiling, utilizing cost indices, to be \$642,377,000; total expenditures are \$471,104,000; and the remaining ceiling balance is \$154,688,000.

Reclamation is implementing salinity control through the Basinwide Program in the following project areas:



## **1. Colorado**

### **a. Cattleman's Harts, Hart/McLaughlin, Rockwell, and Poulsen Ditch Project**

Awarded from the 2012 FOA, this project involves piping a portion of the Cattleman's earthen laterals which are supplied by Crystal Creek, a tributary to the Gunnison River near Crawford, Colorado. Reclamation has awarded an agreement to Cedar Canyon Iron Springs Irrigation Company to provide up to \$1.99 million to pipe 6.3 miles of existing laterals with an expected salt load reduction of about 1,855 tons per year. Construction began in the fall of 2015 and is expected to be completed in the fall of 2016.

### **b. Clipper Irrigation Salinity Control – Project 4**

Awarded from the 2010 FOA, the Clipper Irrigation Salinity Control Project involves piping a portion of the Crawford Clipper Ditch's existing unlined canals in a tributary to the Cottonwood Creek drainage of the Gunnison River near Hotchkiss, Colorado. In September 2012, Reclamation entered into an agreement to provide up to \$1.21 million from the Basinwide Program to pipe 3.5 miles of existing canals with an expected salt load reduction of about 1,427 tons per year. Construction began in the fall of 2014 and was completed in the spring of 2015.

### **c. East Side Laterals Project**

Through Reclamation's Basinwide Program FOAs in 2010 and 2012, the Uncompahgre Valley Water Users Association was awarded cooperating agreements for Phases 5, 7, and 8 as follows:

The UVWUA was awarded a \$4.3 million cooperative agreement for Phase 5 which involves an additional 19 miles of laterals under the Selig and East Canal systems and the reduction of about 5,034 tons of salt loading annually. Construction began in November 2011 and was substantially completed in 2015. The UVWUA was awarded a \$3.2 million cooperative agreement from the Basin States Program for Phase 7 which involves an additional 12.7 miles of laterals under the Selig and East Canal systems and the reduction of about 3,029 tons of salt loading annually. Construction began in the fall of 2012 and is expected to be completed in 2016. The UVWUA was awarded a \$3.54 million cooperative agreement for Phase 8 which involves an additional 14.1 miles of laterals under the South, East, and Loutzenhizer Canal systems and the reduction of about 3,307 tons of salt loading annually. Construction began in the summer of 2015 and is expected to be completed in 2017.

### **d. Grand Valley Irrigation Company Projects**

As a result of selection under the 2010 FOA, the Grand Valley Irrigation Company was awarded a \$2.8 million cooperative agreement to line approximately 1.9 miles of their main canal and pipe about 4,100 feet of ditch within the Grand Valley. A salt loading reduction of approximately 1,749 tons is expected annually. The canal lining will consist of a PVC (polyvinyl chloride) membrane with a shotcrete cover and the pipe will be concrete. Construction began in December 2011 and will continue through 2016.

As a result of selection under the 2012 FOA, the Grand Valley Irrigation Company was awarded a \$4.9 million cooperative agreement to line approximately 2.4 miles of their

main canal within the Grand Valley. A salt loading reduction of approximately 4,001 tons is expected annually. The canal lining will consist of a PVC membrane with a shotcrete cover. Construction began in 2014 and will continue through 2017.

#### **e. Lower Stewart Pipeline Project**

Awarded from the 2010 FOA, the Lower Stewart Pipeline Project involves piping a portion of the Stewart Ditch & Reservoir Company's existing unlined canals in a tributary to the North Fork of the Gunnison River near Paonia, Colorado. Reclamation has entered into an agreement to provide up to \$6 million to pipe 11.5 miles of existing canals with an expected salt load reduction of about 10,920 tons per year. Construction began in the fall of 2012 and was substantially completed in 2015.

#### **f. Mapping and Data Collection Project in Lower Gunnison Basin**

Reclamation entered into a cooperative agreement in 2008 with the Delta Conservation District to map and collect information on water diversion, canals and laterals, and irrigation practices in the Lower Gunnison Basin. This information was needed for participation in the FOA process. In 2012, mapping was completed for the North Fork, Delta, Tongue, and Surface creeks as well as for the Bostwick and Shinn Park areas. In 2013, Reclamation modified its cooperative agreement with the Colorado State Soil Conservation Board to complete the remaining off-farm ditch mapping in the Colona and Ridgway areas. In cooperation with irrigation entities, quality assurance checks are also being performed on previously mapped and newly mapped systems in the Lower Gunnison Basin. Quality assurance checks were completed in 2015 and mapping is anticipated to be completed in 2016.

#### **g. Minnesota Canal Piping Project Phase II**

Phase II was selected in the 2012 FOA. This project involves piping the Minnesota Extension portion of the existing unlined canals in a tributary to the North Fork of the Gunnison River near Paonia, Colorado. Reclamation has awarded an agreement to provide up to \$3.03 million to pipe 3.8 miles of existing canals with an expected salt load reduction of approximately 2,328 tons per year. Construction began in the fall of 2014 and is expected to be completed during the winter of 2015-2016.

#### **h. Paradox Valley Unit**

The Paradox Valley Unit, one of the original salinity control units authorized by Title II of the 1974 Salinity Control Act, intercepts concentrated brine before it reaches the Dolores River and disposes of it by deep well injection. The project, operating since 1996, continues to intercept and dispose of 100,000+ tons of salt annually. Induced seismicity and the increasing pressure necessary to inject the brine into the disposal formation at 14,000 feet are the limiting factors of the project. As the formation fills with brine, the pressure necessary to inject increases. As the pressure increases, the potential for increased seismicity may exist. In January 2013, a magnitude 4.4 earthquake occurred that caused Reclamation to modify injection operations which included a new shut down schedule and injection rate reduction. Those modifications have significantly decreased the injection pressure which could result in additional life of the well. The current projected life of the well remains at three to five years under current operations.

At the request of the Salinity Control Forum, Reclamation initiated an Alternatives Study/Environmental Impact Statement process to evaluate alternative methods for salt disposal at Paradox. A Notice of Intent was published in the *Federal Register* on September 10, 2012, and public scoping meetings were held in Paradox, Montrose, and Grand Junction

in 2012. Reclamation prepared a Scoping Summary Report in 2013. Reclamation continues to have meetings and discussions on the Alternatives Study with the BLM, Environmental Protection Agency, Colorado Department of Public Health and Environment, and other stakeholders. A Record of Decision (ROD) is expected in 2018.

A Request for Information for commercial salinity control alternatives was published in 2015 to identify potential alternatives other than deep well injection and evaporation. One response was received for a brine crystallization process and a contract to evaluate that proposal is currently underway to determine its technical and economic viability.

A panel of experts was convened in March 2015 and presented a list of questions regarding the operation, regulation, and design of evaporation ponds. A final report was received in July 2015 containing the results of that meeting and recommendations on how to proceed. In response to the recommendations, Reclamation has initiated several investigations including an ecological risk assessment to evaluate the migratory bird issue, evaporation pan tests to provide information on pond size, and a pond optimization study to investigate pond operation.

Preliminary evaporation pond cost estimates have been developed, but will be largely dependent on site selection and regulatory requirements.

### **i. Slack/Patterson Laterals Piping Project**

Selected in the 2012 FOA, this project involves piping of the Slack/Patterson laterals portion of the Roger's Mesa Water Distribution Association's existing, unlined laterals supplied by Fire Mountain Canal and Leroux Creek, a tributary to the North Fork of the Gunnison River near Hotchkiss, Colorado. Reclamation has awarded an agreement to provide up to \$3.39 million to pipe 9.5 miles of existing laterals with an expected salt load reduction of approximately 3,345 tons per year. Construction began in the fall of 2014 and is expected to be completed in 2016.

## **2. Utah**

### **a. Cottonwood Creek Consolidated Irrigation Company Projects**

In 2010, through Reclamation's Basinwide Program, the Cottonwood Creek Consolidated Irrigation Company was awarded a cooperating agreement for \$6.5 million to replace approximately 31 miles of earthen canals and laterals with a pressurized pipeline system. The project, located in Emery County west of Castledale, Utah, will result in an annual reduction of 2,094 tons of salt. It is expected that the pressurized pipeline will induce on-farm improvements resulting in an annual reduction of an additional 9,100 tons of salt. Construction is complete and the canals will be taken out of service in the fall of 2015 when all of the farms will be converted to sprinkler irrigation.

The Blue Cut/Mammoth Unit was selected in the 2012 FOA and Reclamation has executed a cooperative agreement to provide \$5.5 million. This project will replace approximately 45.6 miles of earthen canals and laterals with a pressurized pipeline system resulting in the reduction of 3,789 tons of salt per year in the Colorado River at an anticipated cost of approximately \$67.57 per ton. The pressurized pipeline will serve 5,680 acres resulting in additional on-farm salt savings. Construction began in 2014 and is expected to be completed in 2016.

## **b. Huntington-Cleveland Irrigation Company Project**

The Huntington-Cleveland Irrigation Company was awarded a cooperative agreement in 2004 to replace approximately 350 miles of open earthen canals and laterals with a pressurized pipeline distribution system to accommodate sprinkler irrigation on about 16,000 acres. The project is located in northern Emery County in and around the towns of Huntington, Lawrence, Cleveland, and Elmo, Utah. Funding for this project is being shared among Reclamation's Basinwide Program, the Huntington-Cleveland Irrigation Company, NRCS's Environmental Quality Incentives Program, and Rocky Mountain Power. From the Basinwide Program, Reclamation has provided \$17.1 million for the off-farm distribution system and an additional \$4.9 million for completion of the on-farm distribution system. The project was fully operational in the 2014 irrigation season and will result in an annual reduction of 59,000 tons of salt. Of these 59,000 tons, 13,000 tons are attributed to the off-farm distribution system and 46,000 tons are attributed to the on-farm distribution system and salinity control measures (sprinklers).

## **c. South Valley Lateral Salinity Project**

The South Valley Lateral Salinity Project is located in Daggett County south of the town of Manila, Utah. It was selected in the 2012 FOA and was submitted by the Sheep Creek Irrigation Company. A cooperative agreement was executed in May 2013 for \$4.0 million. The project will replace approximately 27,400 feet of earthen laterals with irrigation pipe resulting in an annual reduction of 3,373 tons of salt in the Colorado River at an anticipated cost of approximately \$55.57 per ton. Construction began in the fall of 2014 and is expected to be completed in the spring of 2016.

# **3. Wyoming**

## **a. Austin/Wall Irrigation District Project**

The Austin/Wall Irrigation District Project is located in Uintah County in the vicinity of Lyman, Wyoming. It was selected in the 2012 FOA and was submitted by the Austin/Wall Irrigation District. A cooperative agreement was executed in May 2013 in the amount of \$1.35 million. This project will replace approximately 32,000 feet of earthen canals and laterals with irrigation pipe resulting in an annual reduction of 1,092 tons of salt in the Colorado River at an anticipated cost of approximately \$57.55 per ton. Construction began in the fall of 2015 and is expected to be completed in the spring of 2016.

## **b. Eden Valley, Farson/Eden Pipeline Project**

The Eden Valley, Farson/Eden Pipeline Project was selected from Reclamation's 2008 FOA. Reclamation executed a cooperative agreement in February 2009 in the amount of \$6.45 million from the Basinwide Program. The project will replace approximately 24 miles of earthen laterals with irrigation pipe resulting in an annual reduction of 6,594 tons of salt in the Colorado River at an anticipated cost of approximately \$52.57 per ton. Laterals E-7, E-8, and E-13 are completed and the West Side Canal was completed and operational in 2014. Some habitat replacement work is still pending.

# **4. Basin States Salinity Control Program**

Public Law 110-246 amended the Salinity Control Act creating the Basin States Salinity Control Program (BSP) to be implemented by the Secretary of Interior through Reclamation. Section 205(f) of the Salinity Control Act was amended to provide that cost-share obligations be met through an up-front cost share from the Basin Funds. The amendment also authorizes

Reclamation to expend the required cost-share funds through the BSP for salinity control activities established under Section 202(a)(7) of the Act.

Reclamation made the determination that state agencies within the Upper Basin states are appropriate partners and has executed cooperative agreements to utilize the services of these agencies to assist in funding cost effective activities to reduce salinity in the Colorado River system. Interagency agreements have been executed with the NRCS in the states of Colorado and Utah to provide technical assistance for the BSP.

Applications received by the NRCS through its Environmental Quality Incentives Program that meet NRCS standards, specifications, payment schedules, and have an annualized cost per ton of less than \$150, but that are not eligible for EQIP funding, are considered for funding under the BSP. Reclamation reviews the applications and approves the projects to be funded through the BSP by the appropriate state agency.

As stated above under the Basinwide Salinity Control Program, Reclamation solicits projects through a Funding Opportunity Announcement. Through the FOA process, projects can be ranked in the competitive range, but due to lack of funding are not able to be funded through the Basinwide Program. Reclamation approves some of these projects to be funded through the BSP by the appropriate state agency.

#### **a. Utah Department of Agriculture and Food**

Through the BSP agreement with Reclamation, the Utah Department of Agriculture and Food (UDAF) funded three projects totaling \$3.45 million. The Sheep Creek Irrigation Company project is a canal piping project near Manila, Utah, that was selected through Reclamation's FOA and will cost \$2.9 million and control 2,220 tons of salt per year. The other two projects that came through the NRCS's salinity control program will treat 417 acres and control 1,083 tons of salt with a combined cost of \$0.47 million. All three projects are essentially complete with the exception of minor clean up and restoration planting.

As requested by Reclamation, UDAF has also contracted with Emery County Water Conservancy District for data collection of a long-term study at Desert Lake, Emery County. The UDAF paid Emery County Water Conservancy District \$11,368.85.

The UDAF has paid the Uintah Basin Salinity Coordinator \$38,537.96 during the past federal fiscal year using BSP funds. The coordinator has been successful in bringing several irrigation companies to submit applications for the 2015 FOA. These projects are competitive because of the coordinator's efforts to confederate historically opposing companies into accepting unified systems that improve each company. Improvements with the Ute Tribe have also been made and it is anticipated that in future FOA's the tribe will submit applications. UDAF feels that using BSP funds for this position has greatly benefited the salinity control program in the Uintah Basin area.

#### **b. Colorado State Conservation Board**

In Colorado, the BSP is delivered through six local conservation districts that operate within the boundaries of the approved salinity control areas in the state. These salinity control areas include the Silt Mesa, Grand Valley, Lower Gunnison, McElmo Creek, and Mancos River salinity areas. The Bookcliff, Mesa, Delta, Shavano, Dolores, and Mancos conservation districts receive funds from the Colorado State Conservation Board (CSCB) that in turn receives financial assistance funding based upon a contract agreement with Reclamation. Thirteen district employees are paid from BSP funding.

Reclamation has provided \$5,334,000 in funding to the CSCB. \$1,239,206 has been obligated for nine projects received from the NRCS's EQIP. These projects will result in salt control of 2,155.9 tons and treat and/or serve 611.5 acres at an average cost effectiveness of \$51.37 per ton. Two projects were approved in the Grand Valley area and seven projects were approved in the Lower Gunnison area. Eight of these nine projects are complete.

Utilizing BSP funding received from Reclamation in 2013, the CSCB has contracted with Colorado Parks and Wildlife to fund approximately 491 acres of wildlife improvements along the Colorado River in the Grand Valley for a cost of \$804,415. This project is now under construction with all of the brush control work now completed. \$129,019 has been expended on the project to date. The project has been planned and designed as a joint effort with Colorado Parks and Wildlife, U.S. Fish and Wildlife Service, and NRCS. Completion of this project will satisfy the remaining acres of replacement habitat required in the Grand Valley salinity unit.

The CSCB has contracted with three projects approved by Reclamation from its FOA process for a total cost of approx. \$2.3 million. Construction has been completed for the irrigation portion in the Forked Tongue/Holman Ditch and Bostwick Park projects. Construction of the required wildlife habitat features for these projects is underway and will be completed by October 2016. Construction will begin on the Clipper Zanni Project in the winter of 2015/2016, with anticipated completion by 2016.

The CSCB received \$34,000 in special BSP funding to complete ditch mapping activities in Ouray County in the Lower Gunnison area and to review and complete data for ditch mapping previously completed in other portions of the Lower Gunnison area.

## **B. NATURAL RESOURCES CONSERVATION SERVICE SALINITY CONTROL PROGRAM**

The USDA's Environmental Quality Incentives Program, which currently provides the vehicle for USDA salinity control activities in the Colorado River Basin, is administered by the Natural Resources Conservation Service. In fiscal year 2015, \$12 million was obligated for new EQIP contracts with individual entities to install salinity control measures. An additional \$3.2 million was used to provide technical assistance (planning, engineering design, construction inspections, etc.) to these entities. Cost sharing from the Basin Funds is also available to assist producers and to conduct research, studies, and investigations for further implementation of the program. In 2015, approximately \$6.5 million was provided from the Basin Funds.

Salinity control is currently being implemented by the NRCS in the following project areas:

### **1. Colorado**

#### **a. Grand Valley Unit**

Implementation has been underway on the Grand Valley Unit since 1979. The NRCS feels that the salt control measures of the project have been successfully completed as planned. In 2015, ten new contracts were developed for the Grand Valley Unit. Currently, nearly 144,000 tons of salt control occurs annually due to the Grand Valley Unit Salinity Control Program. A comprehensive survey of the Grand Valley Project area completed in 2010 indicated that 12,500 acres of farmland have been converted to residential use leaving 47,000 acres of irrigated farmland. The same survey found that over 95 percent of irrigated farmland had received treatment and was providing some level of salinity load reduction. Only about 2,000 acres remain untreated. The original salt control goal was exceeded in 2012, but the wildlife habitat replacement is not yet complete. Five tracts of land are under contract and



implementation of habitat practices has begun on these 400 or so acres. The NRCS, working with Reclamation's Basin States Program, the Colorado State Conservation Board, and the Colorado Division of Parks and Wildlife, intends that the full habitat replacement values will be obtained on these tracts within the next two years. The NRCS will continue to provide technical and financial assistance proportional to need and demand even though the project is considered completed.

#### **b. Lower Gunnison Basin Unit**

The Lower Gunnison Basin Unit, initiated in 1988, is the largest of the USDA salinity control units and is located in Delta, Montrose, and Ouray counties. Over 171,000 acres are planned for treatment. Early in fiscal year 2010, the NRCS expanded the designated area to include irrigated land in Ouray County. The application of salinity reduction and wildlife habitat replacement practices continues to be an integral part of implementation of the Lower Gunnison Basin Unit.

In 2015, 44 new contracts were developed on 1,878 acres for planned salt control of about 2,312 tons. About 35 percent of the new projects are sprinkler systems, 60 percent are improved surface systems, and five percent are micro-spray or drip irrigation. The project is about 64 percent complete and controls approximately 119,000 tons of salt annually.

In addition to the EQIP salinity program, \$8 million from the Regional Conservation Partnership Program was awarded to the "Modernizing Agricultural Water Management in the Lower Gunnison River Basin" Project that addresses water quality and quantity concerns within the Lower Gunnison Salinity Project area.

#### **c. Mancos Valley Unit**

The Mancos Valley Unit, initiated in 2004, is bounded by the San Juan National Forest to the north, Mesa Verde National Park to the east, and the Southern Ute Indian Reservation to the south. The project is now in its eighth full year of implementation with 54 landowner contracts. The project will reduce salt loading by 15,500 tons by increasing the irrigation application efficiency on 5,400 acres and reducing seepage in 27 ditches. The total estimated project cost is \$18.9 million. Currently, about 4,408 tons of salt have been controlled out of a goal of 12,000 tons. In 2015, five new contracts were developed bringing the total acres under contract to 7,836. To date, 4,426 tons of salt control has been implemented and 37 percent of the goal has been attained.

#### **d. McElmo Creek Unit**

Implementation of the McElmo Creek Unit was initiated in 1990. Application of salinity reduction and wildlife habitat replacement practices continues to be implemented in this area, but the NRCS is serving smaller agricultural units as urbanization is occurring. In 2015, 32 new contracts were developed on 732 acres that will provide 952 tons of salt control when fully implemented. Currently, about 29,455 tons of salt control occurs annually as a result of the project.

#### **e. Silt Area Project**

The NRCS conducted planning and an evaluation of the irrigated cropland in the area surrounding the community of Silt, Colorado, and determined that cost effective salt control could be implemented. Project activity was approved for fiscal year 2006 and several contracts to implement salinity control measures have been completed. In 2015, three new contracts were developed. Currently, about 2,274 tons of salt are controlled annually, or about 55 percent of the project goal.

## **2. New Mexico**

### **a. San Juan River Unit**

The USDA has completed salinity investigations on irrigated lands along the San Juan River in New Mexico from the vicinity of Fruitland westward to Cudei, New Mexico. The area consists of approximately 8,400 irrigated acres within the boundaries of the Navajo Nation. Findings from the investigation were published in a verification report in July 1993. The findings indicated that irrigation on the unit is contributing to increased salt loading in the San Juan River that ultimately flows into the Colorado River. Reclamation and the NRCS have worked with the San Juan River Dineh Water Users, Inc., to implement a pilot salinity control project. A major earthen lateral has been replaced with a buried pipeline to serve the land of ten Native American farmers. These farmers may now apply to NRCS for EQIP funding to improve their on-farm delivery and application systems that will benefit from the buried pipeline; however, interest has been lacking.

## **3. Utah**

### **a. Green River Project**

This Green River Project was adopted in 2010 with a goal of controlling 6,540 tons of salt annually. The first Environmental Quality Incentives Program contracts were executed in 2010. Currently, there are nine contracts in the project area on 713 acres; five of which were developed in 2015.

### **b. Manila-Washam Area**

In 2006, a salinity control plan and an environmental assessment were completed by the NRCS on irrigated lands near the community of Manila, Utah, along the border with Wyoming. The project would ultimately treat about 11,000 acres with a goal of reducing salt loading by about 17,000 tons annually. Landowner interest has been high in the project area and a significant number of applications for financial assistance have been received. Through 2015, about 8,000 tons of salt control have been implemented on 3,893 acres.

### **c. Muddy Creek Unit**

In 2003-2004, the NRCS conducted planning activities for salt control in cropland areas irrigated from Muddy Creek near the town of Emery, Utah. The Muddy Creek Unit was officially approved in 2005. Plans are to install high-efficiency sprinkler irrigation systems on 6,000 acres of poorly irrigated cropland that will result in approximately 12,000 tons of annual salt control. The total estimated project cost would be approximately \$11.6 million. A large settling and water control basin and new diversion have been constructed by the local irrigation company with technical and financial assistance from the U.S. Army Corps of Engineers. These structures will facilitate salinity control project plans. The first Environmental Quality Incentives Program contract for salinity control was executed in 2010. One new contract was developed in 2015. Currently, there are three active contracts on 251 acres in the project area.

### **d. Price-San Rafael Rivers Salinity Control Unit**

Reclamation and the NRCS issued a joint environmental impact statement for the Price-San Rafael Rivers Salinity Control Unit in December 1993. The Record of Decision indicated that more than 36,000 acres of irrigated lands would receive salt control measures and that several hundred miles of earthen canals and laterals would be replaced with buried pipelines. Each agency has proceeded to implement control measures as its funding and authority allows. Some of the larger units (Ferron, Wellington, Moore Group, and Carbon

Canal) have been substantially implemented; both on farm and off farm. The Huntington-Cleveland Project, which constitutes nearly half of the Price-San Rafael Rivers Salinity Control Unit, is nearly completed. In 2015, 26 new contracts were developed on 1,151 acres. At the end of 2015, the NRCS has assisted with implementation of more than 78,000 tons of on-farm salt control plus 1,500 tons of off-farm control.

#### **e. Uintah Basin Unit**

Implementation of the USDA on-farm portion of the Uintah Basin Unit started in 1980. Side-roll and center pivot sprinkler systems predominate in the project area. In 2015, 16 new contracts were developed on 560 acres. Landowner participation has exceeded expectations to such an extent that the original salt control goal has been exceeded. Currently, more than 157,000 tons of annual salt control occurs on the irrigated agricultural lands. Starting in 1997, Reclamation's Basinwide Program has been replacing earthen canals and laterals with pipelines to provide gravity pressure for on-farm sprinkler systems.

### **4. Wyoming**

#### **a. Big Sandy River Unit**

On-farm salinity control implementation has been underway on the Big Sandy River Unit since 1988. The original goal for salinity reduction is 70 percent complete and wildlife habitat replacement is complete, though there may have been some loss of habitat in recent years. More than 58,000 tons of annual salt control has been achieved. On this project, where practical, farmers have converted nearly all surface flood irrigation to low-pressure sprinkler irrigation systems for salinity control. The Eden Valley Irrigation Company is replacing a significant portion of the canal delivery system with buried pipeline. Phase 1, initiated in 2007, and Phase 2 are essentially complete. Some small increase in on-farm system improvements is expected to occur as a result of the completion of these two phases.

#### **b. Henrys Fork River Unit**

In the spring of 2013, the NRCS officially adopted and initiated the Henrys Fork Project that had been in the planning and evaluation stages since 2009. The first five contracts were developed in 2015 on 141 acres.

### **5. Additional Projects**

In 2010, the NRCS began to quantify the salt control being provided by Environmental Quality Incentives Program irrigation improvement contracts in areas outside of the approved project areas, but within the Upper Colorado River Basin. These have been named "Tier II" areas. In 2015, the Colorado NRCS developed 14 new EQIP contracts for approximately \$500,000 that will control 819 tons of salt when fully implemented.

## **C. BUREAU OF LAND MANAGEMENT SALINITY CONTROL PROGRAM**

The BLM is committed to reducing salinity concentrations in the Colorado River sourced from its public lands as required by amendments to the Colorado River Basin Salinity Control Act of 1974 and mission mandates under the Federal Land Management Policy Act of 1976 (FLMPA). The BLM's primary strategy for reducing salt transport to the Colorado River is to minimize erosion from public lands through its existing land management policies and practices. These policies and practices are intended to maintain or restore land health as reflected by key ecological attributes such as soil and site stability, watershed function, and biotic integrity.

The BLM manages public lands according to a multiple use mandate under the FLMPA. Many land use activities such as livestock grazing, energy development, mining, recreation, timber production, utility transmission, and road management increase erosion and sediment transport. The BLM reduces these impacts to help maintain land health standards by utilizing best management practices including terms, conditions, and stipulations in land use authorizations; and requiring actions to restore lands upon completion of authorized activities. The BLM also engages in many activities to restore degraded ecosystems that contribute excessive sediment and salts to Colorado River Basin watersheds. These activities include constructing and maintaining grade-control structures, spreader dikes, and retention structures; emergency stabilization and rehabilitation efforts following wildfires; removal of invasive plant species; channel stabilization and other riparian enhancements; maintaining road culverts; remediation of abandoned mine lands; and fire fuels reduction treatments.

Salinity reductions for many of these activities continue to be difficult to quantify and report to the Salinity Control Forum because of factors such as (1) lack of adequate understanding about mobilization and transport of salts from rangelands and (2) inability to conduct effectiveness monitoring for all projects. A computer tool is now being funded to assist in the quantification of sediment retention due to the vastness of BLM's lands.

The BLM established a Salinity Coordinator position in 2003, but has since modified the duties and made some organization changes. Administrative responsibility for the position was transferred from the Washington Office to the National Operations Center and job duties were combined with a National Water Quality Specialist position. Duties for the Salinity Coordinator position include: (1) coordinating activities in state offices, (2) developing and refining approaches and protocols to advance abilities to understand transport mechanisms and quantify reductions achieved from land management activities, (3) collaborating among the BLM, Reclamation, and NRCS, (4) and completing BLM Salinity Act requirements (i.e., Public Law 106-459 that requires the BLM to prepare a Report to Congress on the status of implementation of its comprehensive program for minimizing salt contributions to the Colorado River from lands administered by the BLM). Significant progress was made in these areas through fiscal year 2014.

Due to the position being vacant for most of 2012, the BLM allocated \$100,000 in fiscal year 2012 to initiate a collaborative study with the Agricultural Research Service (ARS) and National Agricultural Library that later developed into a larger study including Reclamation, NRCS, Salinity Control Forum, ARS, and U.S. Geological Survey to link management practices and resulting salinity loads in a worldwide dynamic bibliography. The BLM selected a candidate to fill the vacancy in January 2013.

The BLM allocated \$700,000 in fiscal year 2012, \$750,000 in 2013, and \$1,260,000 in 2014 to support projects specifically relating to salinity control program objectives in its Colorado River Basin state offices. Project funding is allocated toward proposals submitted by state offices through the BLM budget planning system and prioritized using input from the Salinity Coordinator. Funding is allocated between planning, science, and on-the-ground implementation projects. A separate funding source is used each year to support labor and operations for the Salinity Coordinator. Since the Salinity Coordinator was hired in January 2013, the BLM Salinity Program has become very active and has taken a more invested approach toward salinity and sediment reduction and management actions.

Primarily, the BLM has been accounting for sediment transport from terrestrial upland areas. However, the BLM Salinity Program has begun to include many other contributions to sediment erosion reduction. Traditionally there has not been a comprehensive way to account for all of the contributions made from the other BLM programs. However, the BLM is currently developing tools and using limited resources more efficiently and effectively.

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# **Upper Colorado River Commission**

## **APPENDIX A**

### **Annual Financial Report**

**For the Year Ended  
June 30, 2015**



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# Upper Colorado River Commission

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# **Ulrich & Associates, PC**

## **Certified Public Accountants**

### **INDEPENDENT AUDITORS' REPORT**

The Commissioners of the  
Upper Colorado River Commission  
Salt Lake City, Utah

#### Report on the Financial Statements

We have audited the accompanying financial statements of the governmental activities and major fund information of Upper Colorado River Commission as of and for the year ended June 30, 2015, which comprise the Commission's basic financial statements as listed in the table of contents. These financial statements are the responsibility of Upper Colorado River Commission's management. Our responsibility is to express an opinion on these financial statements based on our audit.

#### Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

#### Auditor's Responsibility

Our responsibility is to express opinions on these financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in Government Auditing Standards, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Members of Utah Association of CPAs | American Institute of CPAs

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## Opinions

In our opinion, the financial statements referred to above present fairly, in all material respects, the respective financial position of the governmental activities and major fund information of Upper Colorado River Commission as of June 30, 2015, and the respective changes in financial position thereof and the budgetary comparison for the general fund for the year then ended in conformity with accounting principles generally accepted in the United States of America.

## Other Matters

### *Required Supplementary Information*

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis, and budgetary comparison information be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board, who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

### *Other Information*

Our audit was conducted for the purpose of forming opinions on the financial statements that collectively comprise the Upper Colorado River Commission's financial statements as a whole. The supplemental schedule of cash receipts and disbursements, and the supplemental schedule of expenses – budget to actual, are presented for purposes of additional analysis and are not a required part of the financial statements. These schedules are the responsibility of management and were derived from and relate directly to the underlying accounting and other records used to prepare the financial statements. The information has been subjected to the auditing procedures applied in the audit of the financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the information is fairly stated in all material respects in relation to the financial statements taken as a whole.

*Ulrich & Associates, PC*

October 9, 2015



# Upper Colorado River Commission

## Management's Discussion and Analysis

June 30, 2015

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This discussion and analysis is intended to be an easily readable analysis of the Upper Colorado River Commission (the Commission) financial activities based on currently known facts, decisions, or conditions. This analysis focuses on current year activities and should be read in conjunction with the financial statements that follow.

### Financial Highlights

The overall assets of the Commission exceed its liabilities by \$409,522, an increase of \$33,662 over the prior year. This increase was mainly due to an increase in assessments.

During the prior year the Commission established a reserved cash account with the Utah PTIF fund. This account is used to hold cash to pay the accrued unpaid leave upon the separation or retirement of employees. The Commission deposited \$20,000 into the account in the current year.

### Report Layout

Besides this Management's Discussion and Analysis (MD&A), the report consists of government-wide statements, fund financial statements, and the notes to the financial statements. The first two statements are condensed and present a government-wide view of the Commission's finances. Within this view, all Commission operations are categorized and reported as governmental activities. Governmental activities include basic services and administration. The Commission does not have any business-type activities. These government-wide statements are designed to be more corporate-like in that all activities are consolidated into a total for the Commission.

### Basic Financial Statements

The Statement of Net Position focuses on resources available for future operations. In simple terms, this statement presents a snap-shot view of the assets the Commission, the liabilities it owes and the net difference. The net difference is further separated into amounts restricted for specific purposes and unrestricted amounts.

The Statement of Activities focuses gross and net costs of the Commission's programs and the extent to which such programs rely upon general revenues. This statement summarizes and simplifies the user's analysis to determine the extent to which programs are self-supporting and/or subsidized by general revenues.



# Upper Colorado River Commission

## Management's Discussion and Analysis

June 30, 2015

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The notes to the financial statements provide additional disclosures required by governmental accounting standards and provide information to assist the reader in understanding the Commission's financial condition.

The MD&A is intended to explain the significant changes in financial position and differences in operation between the current and prior years. Significant changes from the prior year are explained in the following paragraphs.

### Commission as a Whole

#### Government-wide Financial Statements

A condensed version of the Statement of Net Position follows:

Net Position at Year-end June 30		
	2015	2014
Cash & investments	\$ 432,091	381,067
Capital assets (net)	42,166	41,550
Total assets	<u>474,257</u>	<u>422,617</u>
Current liabilities	31,720	10,696
Non-current liabilities	33,015	36,061
Total liabilities	<u>64,735</u>	<u>46,757</u>
Net position:		
Invested in capital assets	18,007	41,550
Unrestricted	391,515	334,310
Total net position	<u>\$ 409,522</u>	<u>375,860</u>

During the year ended June 30, 2015 the biggest change in net position occurred due to an increase in assessment revenue. The commission also purchased a copier and a new desk.

# Upper Colorado River Commission

## Management's Discussion and Analysis

June 30, 2015

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A condensed version of the Statement of Activities follows:

### Governmental Activities For the year ended June 30

	<u>2015</u>	<u>2014</u>
Revenues		
Program Revenues		
Charges for Services	510	709
Assessments	399,220	380,210
General Revenues		
Interest	2,343	2,470
Total Revenues	<u>402,073</u>	<u>383,389</u>
Expenses		
Administration	<u>368,411</u>	<u>371,503</u>
Change in net position	33,662	11,886
Beginning net position	375,860	363,974
Ending net position	<u>\$ 409,522</u>	<u>375,860</u>

The increase in the assessment revenue and no significant increases in expenditures created an increase in the net position.

### Capital Assets

At June 30, 2015 the Commission had \$42,166 invested in capital assets, consisting primarily of a building and furniture & equipment. The change in capital assets during the year consisted of purchasing a new copier and continued depreciation expense.

### Capital Assets at Year-end

	<u>2015</u>	<u>2014</u>
Land	\$ 24,159	24,159
Building	79,827	79,827
Improvements	2,207	2,207
Furniture & equipment	<u>80,721</u>	<u>77,185</u>
Subtotal	186,914	183,378
Less: Accumulated Depreciation	<u>(144,748)</u>	<u>(141,828)</u>
Capital assets, net	<u>\$ 42,166</u>	<u>41,550</u>

# **Upper Colorado River Commission**

## **Management's Discussion and Analysis**

**June 30, 2015**

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### **Financial Contact**

The Commission's financial statements are designed to present users (citizens, taxpayers, state governments) with a general overview of the Commission's finances and to demonstrate the Commission's accountability. If you have questions about the report or need additional financial information, please contact the Commission's secretary at 355 South 400 East, Salt Lake City, UT 84111.

## **Basic Financial Statements**

# Upper Colorado River Commission

## Statement of Net Position

June 30, 2015

	<b>Governmental Activities</b>
<b><u>Assets</u></b>	
Cash & cash equivalents	
Operations	\$ 371,792
Unpaid leave	40,299
Restricted cash	
SCPP	20,000
Capital assets	
Land	24,159
Building	79,827
Improvements other than building	2,207
Furniture & equipment	80,721
Less: accumulated depreciation	(144,748)
Total Assets	<u>474,257</u>
<b><u>Liabilities</u></b>	
Accounts payable	9,052
Retirement payable	1,176
Compensated absences	1,492
SCPP held in trust	20,000
Total current liabilities	<u>31,720</u>
Noncurrent liabilities:	
Accrued compensated absences	33,015
Total noncurrent liabilities	<u>33,015</u>
Total Liabilities	<u>64,735</u>
<b><u>Net Position</u></b>	
Invested in capital assets	18,007
Unrestricted	391,515
Total Net Position	<u>\$ 409,522</u>

See accompanying notes to the basic financial statements

# Upper Colorado River Commission

## Statement of Activities

For the Year ended June 30, 2015

		Program Revenues		Net Revenue and Changes in Net Position
		Charges	Operating	
	<u>Expenses</u>	<u>for services</u>	<u>grants and contributions</u>	<u>Total</u>
Governmental activities:				
General administration	\$ 368,411	510	399,220	31,319
Total governmental activities	<u>368,411</u>	<u>510</u>	<u>399,220</u>	<u>31,319</u>
General revenues:				
Interest				2,343
Total general revenues				<u>2,343</u>
Change in Net Position				33,662
Net Position - Beginning of Year				<u>375,860</u>
Net Position - End of Year				<u>\$ 409,522</u>

See accompanying notes to the basic financial statements



# Upper Colorado River Commission

## Balance Sheet

### Governmental Funds

June 30, 2015

	General Fund
<b><u>Assets</u></b>	
Petty cash	\$ 25
Cash in bank	30,719
Utah public treasurers' investment pool	
Operations	341,048
Unpaid Leave	40,299
	<u>412,091</u>
Restricted cash	
Cash in bank - SCPP	20,000
Total Assets	<u>432,091</u>
<b><u>Liabilities</u></b>	
Accounts payable	9,052
Accrued liabilities	1,176
Accrued benefits	1,492
SCPP held in trust	20,000
Total Liabilities	<u>31,720</u>
<b><u>Fund Balance</u></b>	
Assigned to:	
Unpaid leave	33,015
Unassigned	367,356
Total Fund Balance	<u>400,371</u>
Total Liabilities and Fund Balance	<u>\$ 432,091</u>

#### Reconciliation of the Statement of Net Position to the Balance Sheet

Amounts reported for governmental activities in the statement of net position are different because:

Total fund balance reported above	\$ 400,371
Capital assets used in governmental activities are not financial resources and, therefore, are not reported in the funds	42,166
Compensated absences are not due and payable in the current period and, therefore, are not reported in the funds	<u>(33,015)</u>
Net position of governmental activities (page 9)	<u>\$ 409,522</u>

See accompanying notes to the basic financial statements

**Upper Colorado River Commission**  
**Statement of Revenues, Expenditures, and Changes in Fund Balance**  
**Governmental Funds**  
**For the Year Ended June 30, 2015**

	<u>Original &amp; Final Budget</u>	<u>General Fund</u>	<u>Variance w/Final Budget</u>
<b><u>Revenues</u></b>			
Assessments	\$ 399,220	399,220	-
Interest	-	2,343	2,343
Waternews subscriptions & refunds	400	510	110
Total Revenues	<u>399,620</u>	<u>402,073</u>	<u>2,453</u>
<b><u>Expenditures</u></b>			
Personal services	344,772	305,718	39,054
Travel	36,000	24,231	11,769
Current operating	43,100	36,064	7,036
Capital outlay	5,500	6,060	(560)
Contingencies	5,000	-	5,000
Total Expenditures	<u>434,372</u>	<u>372,073</u>	<u>62,299</u>
Excess of revenues over expenditures	(34,752)	30,000	64,752
Fund Balance - beginning of year	<u>370,371</u>	<u>370,371</u>	<u>-</u>
Fund Balance - end of year	<u><u>335,619</u></u>	<u><u>400,371</u></u>	<u><u>64,752</u></u>

**Reconciliation of the statement of Revenues, Expenditures and Changes  
in Fund Balances of Governmental Funds to the Statement of Activities**

Net change in fund balance (as reported above)	30,000
Governmental funds report capital outlays as expenditures. However, in the statement of activities, the cost of those assets is allocated over their estimated useful lives as depreciation expense. This is the amount by which depreciation exceeded capital outlays in the current period.	616
The expense for accrued compensated absences reported in the statement of activities does not require the use of current financial resources and, therefore, are not reported as expenditures in governmental funds.	<u>3,046</u>
Change in net position of governmental activities (page 10)	<u><u>33,662</u></u>

See accompanying notes to the basic financial statements

# Upper Colorado River Commission

## Notes to Financial Statements

For the Year Ended June 30, 2015

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### Note 1 - Summary of Significant Accounting Policies

#### A. Reporting entity

The Commission was formed pursuant to the terms of the Upper Colorado River Basin Compact on October 11, 1948, and consented to by the Congress of the United States of America by Act on April 6, 1949, as an administrative agency representing the Upper Division States of the Colorado Basin, namely Colorado, New Mexico, Utah, and Wyoming. The Commission consists of one commissioner representing each of the four states and one representing the United States of America. The activities of the commission are conducted for the purpose of promoting and securing agricultural and industrial development of the Upper Basin's water resources.

The commission has no component units that are included with this report.

#### B. Basis of Presentation - Government-wide financial statements

While separate government-wide and fund financial statements are presented, they are interrelated. The governmental activities column incorporates data from the governmental fund. The Commission does not currently have any business-type activities.

#### C. Basis of Presentation - Fund financial statements

The fund financial statements provide information about the Commission's funds. Statements for the only fund category (governmental) is presented. The emphasis of fund financial statements is on major governmental funds, each displayed in a separate column. The Commission has only a general governmental fund that is reported as a major fund in the fund financial statements.

#### D. Measurement focus and basis of accounting

##### Government wide financial statements

The accounting and financial reporting treatment is determined by the applicable measurement focus and basis of accounting. Measurement focus indicates the type of resources being measured such as current financial resources or economic resources. The basis of accounting indicates the timing of transactions or events for recognition in the financial statements.

The government-wide statements are prepared using the *economic resources* measurement focus and the accrual basis of accounting. Revenues are recorded when earned and expenses are recorded when a liability is incurred, regardless of the timing of related cash flows.

The governmental fund financial statements are reported using the current financial resources measurement focus and the *modified accrual basis of accounting*. Revenues are recognized as soon as they are both measurable and available. Revenues are considered to be available when they are collectible within the current period or soon enough thereafter to pay liabilities of the current period. For this purpose, the government considers revenues to be available if they are collected within 60 days of the end of the current fiscal period. Expenditures generally are recorded when a liability is incurred, as under accrual accounting. However, debt service expenditures, as well as expenditures related to compensated absences, and claims and judgments, are recorded only when payment is due. General capital asset acquisitions are reported as expenditures in governmental funds. Issuance of long-term debt and acquisitions under capital leases are reported as other financing sources.



**Upper Colorado River Commission**  
**Notes to Financial Statements - Continued**  
**For the Year Ended June 30, 2015**

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**E. Budgetary Information**

Annual budgets are prepared on the modified accrual basis of accounting and adopted as required by the compact. The Commission approves the annual budget in total and by major sub-items as identified in the statement of revenues, expenditures and changes in fund balance - budget and actual. The Executive Director has authority to transfer budget accounts within the sub-items with Commissioner approval required to transfer monies between expenditure categories.

**F. Assets, liabilities, deferred outflow/inflows of resources, and net position/fund balance**

**Cash & cash equivalents**

The government's cash and cash equivalents are considered to be cash on hand, demand deposits, and short-term investments with original maturities of three months or less from the date of acquisition.

**Capital Assets and Depreciation**

Capital assets, which include property and equipment, are reported in the governmental activities column in the government-wide financial statements. Capital assets are defined by the Commission as assets with an initial, individual cost of more than \$1,000 and an estimated useful life in excess of one year.

Depreciation of capital assets is computed and recorded by the straight-line method. Estimated useful lives of the various classes of depreciable capital assets are as follows: buildings, 30 years; improvements, 10 to 15 years; furniture and equipment, 3 to 15 years.

**Fund balance policies**

Fund balance of governmental funds is reported in various categories based on the nature of any limitations requiring the use of resources for specific purposes. The Commission itself can establish limitations on the use of resources through either a commitment (committed fund balance) or an assignment (assigned fund balance).

**Net Position / Fund Balance**

***Government-wide Financial Statements***

Equity is classified in the government-wide financial statements as net assets and can be displayed in three components:

# Upper Colorado River Commission

## Notes to Financial Statements - Continued

### For the Year Ended June 30, 2015

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**Invested in capital assets, net of related debt** - Capital assets including restricted assets, net of accumulated depreciation and reduced by any debt related to the acquisition or improvement of the assets.

**Restricted net position** - Net position with constraints placed on the use either by (1) external groups or (2) law through constitutional provisions or enabling legislation.

**Unrestricted net position** - All other net positions that do not meet the definition of "restricted" or "invested in capital assets, net of related debt."

#### *Fund Financial Statements*

In the fund financial statements, governmental fund equity is classified as fund balance. Fund balance is further classified as Nonspendable, Restricted, Committed, Assigned, or Unassigned. Description of each classification is as follows:

**Nonspendable fund balance** - Amounts that cannot be spent because they are either (a) not in spendable form, or (b) legally or contractually required to be maintained intact.

**Restricted fund balance** - Amounts restricted by enabling legislation. Also if, (a) externally imposed by creditors, grantors, contributors, or laws and regulations of other governments, or (b) imposed by law through constitutional provisions or enabling legislation.

**Committed fund balance** - Amounts that can only be used for specific purposes pursuant to constraints imposed by formal action of the Commission's highest level of decision making authority.

**Assigned fund balance** - Amounts that are constrained by the Commission's intent to be used for specific purposes, but are neither restricted nor committed.

**Unassigned fund balance** - Residual classification of the General Fund. This classification represents fund balance that has not been restricted, committed, or assigned specific purposes within the general fund.

# Upper Colorado River Commission

## Notes to Financial Statements - Continued

### For the Year Ended June 30, 2015

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#### **Unpaid Compensated Absences**

According to Commission policy each employee accrues annual leave based on years of service with the commission. Employees may accumulate a maximum of 30 days of unused annual leave, which is paid in cash upon termination of employment. The Commission's secretary may grant additional carryover to employees provided that: (1) the employee requests the carryover in writing prior to June 30, and (2) the employee uses the additional carryover within 90 days of the start of the fiscal year.

The Obligation for Compensated Absences has been broken down into two components; current and non-current. The current portion is classified as part of the general fund and is an estimate of the amounts that will be paid within the next operating year. The non-current portion is maintained separately and represents a reconciling item between the fund and government-wide presentations.

#### **Note 2 - Stewardship, compliance, and accountability**

##### **Accounting and Reporting**

The Commission is not required to report to any individual state or federal agency. Financial reports are given to each Commissioner and is reviewed by them. The Commission is exempt from federal income tax reporting under 501(c) (1) of the internal revenue code.

#### **Note 3 - Detail notes on all activities and funds**

##### **Cash and Cash Equivalents**

The Commissioners have authorized the Commission to deposit funds in demand accounts at Wells Fargo Bank and deposit funds with the Utah Public Treasurers' Investment Pool.

As of June 30, 2015, the Commission had the following deposits and investments:

	<u>Fair Value</u>
Cash on deposit	\$ 42,028
Utah Public Treasurers' Investment Pool	381,347
	<u>\$ 423,375</u>

##### **Cash and Cash Equivalents (Continued)**

*Interest rate risk.* The Commission manages its exposure to declines in fair value by only investing in the Utah Public Treasurers Investment Fund.

*Credit risk.* As of June 30, 2015, the Utah Public Treasurer's Investment Fund was unrated.



# Upper Colorado River Commission

## Notes to Financial Statements - Continued

### For the Year Ended June 30, 2015

*Concentration of credit risk.* The Commission's investment in the Utah Public Treasurer's Investment Fund has no concentration of credit risk.

*Custodial credit risk - Deposits.* In the case of deposits, this is the risk that in the event of a bank failure, the government's deposits may not be returned to it. As of June 30, 2015, none of the \$42,028 balance of deposits was exposed to custodial credit risk because it was insured.

*Custodial credit risk - Investments.* For an investment, this is the risk that, in the event of the failure of the counterparty, the Commission will not be able to recover the value of its investments that are in the possession of an outside party. The Commission's investment in the Utah Public Treasurer's Investment Fund has no custodial credit risk.

Components of cash and investments (including interest earning deposits) at June 30, 2015,

Cash on deposit	\$ 30,744
Utah State Treasurer's Investment Pool	381,347
Restricted cash - SCPP	20,000
	<u>\$ 432,091</u>

#### Capital Assets

Capital asset activity for the year ended June 30, 2015, is as follows:

	Balance at June 30, 2014	Additions	Disposals	Balance at June 30, 2015
Capital assets not being depreciated:				
Land	\$ 24,159	-	-	24,159
Total capital assets not being depreciated	<u>24,159</u>	<u>-</u>	<u>-</u>	<u>24,159</u>
Capital assets being depreciated:				
Building	79,827	-	-	79,827
Improvements	2,207	-	-	2,207
Furniture & Equipment	77,185	3,536	-	80,721
Total capital assets being depreciated	<u>159,219</u>	<u>3,536</u>	<u>-</u>	<u>162,755</u>
Less accumulated depreciation for:				
Building	71,158	1,475	-	72,633
Improvements	2,207	-	-	2,207
Furniture & Equipment	68,463	1,445	-	69,908
Total accumulated depreciation	<u>141,828</u>	<u>2,920</u>	<u>-</u>	<u>144,748</u>
Total capital assets, being depreciated, net	<u>17,391</u>	<u>616</u>	<u>-</u>	<u>18,007</u>
Capital assets, net	<u>\$ 41,550</u>	<u>616</u>	<u>-</u>	<u>42,166</u>

**Upper Colorado River Commission**  
**Notes to Financial Statements - Continued**  
**For the Year Ended June 30, 2015**

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Depreciation expense of \$2,920 was charged to the general administration activity of the Commission.

**Note 4 - Other notes**

**Employee Retirement Plan**

The Commission's employee pension plan is a 401(K) defined contribution plan which covers all of the present employees. The Commission contributes 7% of the employees' gross salaries. In addition, the Commission will match contributions made by employees up to a maximum of 3%. Accordingly, the maximum allowable contribution by the Commission is 10%. The employees are allowed to contribute up to the maximum allowed by law. The employer's share of the pension plan contribution for the year ended June 30, 2015 was \$23,851, which includes \$200 of administrative costs.

**Risk Management**

The Commission is exposed to various risks of loss related to torts; theft of, damage to, and destruction of assets; errors and omissions; and natural disasters for which the government carries commercial insurance.

**Subsequent Events**

Subsequent events have been evaluated through August 25, 2015 the date the financial statements were available to be issued. There have been no subsequent events that provide additional evidence about conditions that existed at the date of the balance sheet.

## **Supplemental Schedules**

# Upper Colorado River Commission

## Supplemental Schedule of Cash Receipts and Disbursements

### For the Year Ended June 30, 2015

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Cash at June 30, 2014		\$ 381,067
Cash Receipts:		
Assessments	399,220	
Interest	2,343	
Refunds	60	
Waternews Subscriptions	450	
	<u>          </u>	402,073
Cash Disbursements:		
Personal Services	305,868	
Travel	25,891	
Current Operating	33,230	
Capital Outlay	6,060	
Contingency	<u>          </u>	<u>371,049</u>
Cash at June 30, 2015		\$ <u>412,091</u>

**Upper Colorado River Commission**  
**Detail of Personal Services and Current Operating**  
**Expenditures - Budget to Actual (Accrual Basis)**  
**For the Year Ended June 30, 2015**

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	<u>Budget</u>	<u>Actual</u>	Variance w/Final <u>Budget</u>
<b>Summary of Personal Services with Budget Comparisons</b>			
Executive director	\$ 111,396	111,396	-
Administrative secretary	35,183	35,183	-
General counsel	90,567	90,567	-
Consulting services	34,130	1,422	32,708
Social security	18,094	17,783	311
Pension fund contributions	24,102	23,851	251
Employee medical insurance	30,000	24,766	5,234
Janitorial	1,300	750	550
	<u>\$ 344,772</u>	<u>305,718</u>	<u>39,054</u>

**Summary of Current Operating  
Expenditures with Budget Total Comparison**

Audit and accounting	\$ 4,600	4,120	480
Building repair & maintenance	4,000	3,803	197
Insurance	3,400	2,280	1,120
Library	7,800	8,224	(424)
Meetings, including reporter	2,400	1,583	817
Memberships and registrations	3,300	2,427	873
Office supplies and postage	3,500	2,581	919
Printing	4,000	2,859	1,141
Telephone	4,800	4,193	607
Utilities	5,300	3,994	1,306
	<u>\$ 43,100</u>	<u>36,064</u>	<u>7,036</u>

# Upper Colorado River Commission

## **APPENDIX B**

## **BUDGET**

**Fiscal Year Ending June 30, 2016**



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**APPROVED FY 2016 Budget  
UPPER COLORADO RIVER COMMISSION  
Fiscal Year Ending June 30, 2016  
Approved at the June 18, 2015 Durango Commission Meeting**

	<b>As Approved 7/18/2015</b>
<b>Personnel Cost Including Pension, Social Security and Health Insurance</b>	<b>331,518</b>
<b>Travel</b>	<b>36,000</b>
<b>Current Expense</b>	<b>44,600</b>
<b>Janitor</b>	<b>1,400</b>
<b>Income (Newsletter)</b>	<b>-400</b>
<b>Funding to Capitalize Leave Sinking Fund</b>	<b>20,000</b>
<b>Capital Expense</b>	<b>5,200</b>
<b>Contingency</b>	<b>5,000</b>
<b>Total</b>	<b>443,318</b>
 <b>2016 State Assessments</b>	
	<b>State %                      FY 16</b>
<b>Colorado</b>	<b>51.75%                      229,417</b>
<b>New Mexico</b>	<b>11.25%                      49,873</b>
<b>Utah</b>	<b>23.00%                      101,963</b>
<b>Wyoming</b>	<b>4.00%                      <u>62,064</u></b>
<b>Total</b>	<b>\$443,317</b>

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# Upper Colorado River Commission

## **APPENDIX C**

## **RESOLUTIONS**

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RESOLUTION  
of the  
UPPER COLORADO RIVER COMMISSION

Regarding Restatement of the Commission's 401(k) Profit Sharing Plan

WHEREAS, the Upper Colorado River Commission has previously instituted its 401(k) Profit Sharing Plan to provide its employees with retirement benefits; and

WHEREAS, the Upper Colorado River Commission 401(k) Profit Sharing Plan (pension plan) consists of modifications to a prototype plan produced by Alliance Benefit Group-Rocky Mountain;

WHEREAS, starting in 2014, the Internal Revenue Service requires document restatements for virtually all 401(k) plans, profit sharing plans and money purchase plans, including the Commission's pension plan;

WHEREAS, this restatement is commonly known as the "PPA" restatement, because it contains many legislative updates passed as part of the Pension Protection Act of 2006; and

WHEREAS, while the restatement involves amending the Commission's pension plan in its entirety, the major plan provisions will not change, and there will be no additional costs to the Commission;

NOW, THEREFORE, BE IT RESOLVED that the pension plan be amended and restated in the form provided by Alliance Benefit Group-Rocky Mountain, which plan is hereby adopted and approved;

BE IT FURTHER RESOLVED that the appropriate officers of the Commission be, and they hereby are, authorized and directed to execute the pension plan on behalf of the Commission;

BE IT FURTHER RESOLVED that Dennis J. Strong and Jane Bird are hereby retained as the Trustees of the Plan; and

BE IT FURTHER RESOLVED that the officers of the Commission be, and they hereby are, authorized and directed to take any and all actions and execute and deliver such documents as they may deem necessary, appropriate or convenient to effect the foregoing resolutions including, without limitation, causing to be prepared and filed such reports, documents or other information as may be required under applicable law.

CERTIFICATE

I, DON A. OSTLER, Executive Director and Secretary of the Upper Colorado River Commission, do hereby certify that the above Resolution was unanimously adopted by the Upper Colorado River Commission at its Meeting held in Las Vegas, Nevada on December 10, 2014.

WITNESS my hand this 10<sup>th</sup> day of December, 2014.

  
DON A. OSTLER  
Executive Director and Secretary



RESOLUTION  
of the  
UPPER COLORADO RIVER COMMISSION  
December 10, 2014

Regarding Development of an Emergency Upper Basin Drought Contingency Plan

WHEREAS, the Upper Colorado River Commission (Commission) was created by the Upper Colorado River Basin Compact (Compact) between the States of Arizona, Colorado, New Mexico, Utah and Wyoming on October 11, 1948, and consented to by Congress by the Act of April 6, 1949 (63 Stat. 31, Chapter 48);

WHEREAS, Article VIII of the Compact empowers the Commission to perform certain functions including, but not limited to:

- i. Engaging in cooperative studies of water supplies of the Colorado River and its tributaries;
- ii. Collecting, analyzing, correlating, preserving and reporting on data as to the stream flows, storage, and diversion of water from the Colorado River and its tributaries;
- iii. Making findings as to the quantity of water of the Upper Colorado River System used each year in the Upper Colorado River Basin and in each Upper Basin State;
- iv. Making findings on the quantity of water deliveries at Lee Ferry during each water year;
- v. Making findings as to the necessity for and the extent of the curtailment of use required, if any; and
- vi. Performing all functions required by the Compact and doing all things necessary, proper and convenient in the performance of its duties either independently or in cooperation with any state or federal agency;

WHEREAS, the Colorado River Storage Project Act (CRSP Act) and the Colorado River Basin Project Act authorized the Secretary of the Interior to construct and operate initial units consisting of Glen Canyon, Flaming Gorge, Curecanti (Aspinall), and Navajo, to, among other things, allow Colorado, New Mexico, Utah and Wyoming (collectively, the "Upper Division states") to utilize their share of the Colorado River and meet their obligations at Lee Ferry under the Colorado River Compact;

WHEREAS, Lake Powell serves as the primary storage facility for the Upper Division states to ensure ongoing compliance with the Colorado River Compact without curtailment of annual consumptive uses in the Upper Basin;

WHEREAS, the period 2000 to 2014 constituted the most severe 15 year drought in the long history of recordkeeping for the Colorado River Basin, leading to marked fluctuations in water elevations and low storage at Lake Powell and contributing to sustained decreases in water elevations and storage at Lake Mead;

WHEREAS, the seven (7) Colorado River Basin states met with the Secretary of the Interior in June 2013 to discuss the status of the Colorado River reservoir system and initiate a process for investigating mitigation actions that might be taken in response to drought;

WHEREAS, the Upper Division states, through the Commission, have been working in parallel with the Lower Division states (Arizona, California, and Nevada) and in conjunction with the Department of the Interior to explore, develop and implement drought contingency options to avoid reaching critical reservoir elevations at either Lake Powell or Lake Mead;

WHEREAS, hydropower generated from Lake Powell provides stability for the Western Power Interconnection and funding for operation and maintenance of the primary CRSP Act units and for environmental and development programs throughout the Upper Basin;

WHEREAS, if water elevations at Lake Powell reach minimum power pool levels, water supply and development for consumptive and non-consumptive uses in the Upper Basin and power supply options for the Western Area Power grid could be compromised; and

WHEREAS, the Commission desires to be prepared to mitigate the adverse effects of severe drought in the event that such extreme conditions continue to persist into the future.

NOW, THEREFORE, BE IT RESOLVED that, considering the recitals outlined above, the Commission intends to work expeditiously in tandem with the Lower Division states and the Department of the Interior to develop an Emergency Upper Basin Drought Contingency Plan for purposes of prudent water management consistent with the Colorado River and Upper Colorado River Basin Compacts;

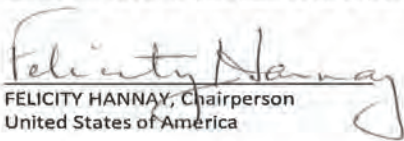
BE IT FURTHER RESOLVED that as part of the Emergency Upper Basin Drought Contingency Planning process, the Commission commits to:

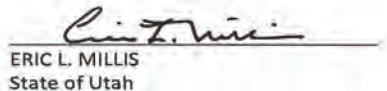
- i. Employ best efforts to expand both the geographical and temporal extent of weather modification programs within the Upper Division states to help boost snow accumulation and system water in the Upper Colorado River Basin. In furtherance of this effort, Colorado, Wyoming and Utah have and will continue working to try to secure additional funds to continue and expand weather modification programs to enhance runoff through weather modification in appropriate areas.
- ii. Develop and finalize a uniform plan to extend and coordinate operations of the initial units authorized under the CRSP Act to:
  - a. Help avoid or mitigate impacts from Lake Powell reaching the critical, minimum power pool elevation;
  - b. Reduce any long-term risk of impairing annual consumptive uses due to compact curtailments in the Upper Basin; and
  - c. Recover storage in the CRSP units as quickly as practicable consistent with the Colorado River and Upper Colorado River Basin Compacts as well as other applicable state and federal laws.

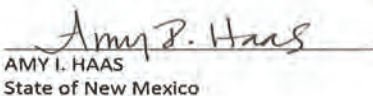
To further this effort, the Commission’s engineering and legal committees will continue to work with the Federal Government and interested stakeholders to identify strategies and mechanisms for extending operations at the initial CRSP units in a manner consistent with existing technical understandings and legal constraints ; and

- iii. Explore the feasibility of developing and employing temporary, voluntary, compensated demand management program(s) within the Upper Basin in a manner that helps reduce consumptive uses, if and when needed, to protect against impacts from Lake Powell reaching critical elevations and to help ensure ongoing compliance with the Colorado River Compact without impairing the right to exercise any existing water rights in the future. To inform this investigation, the Commission will, among other things:
  - a. Consider basin wide approaches such as the 2012 Colorado River Basin Supply and Demand Study and its Next Steps Process;
  - b. Support pilot programs such as those contemplated under the July 30, 2014 System Conservation Agreement; and
  - c. Support intrastate efforts to explore demand management mechanisms within each of the Upper Division states.

BE IT FURTHER RESOLVED that the Commission hereby directs its staff to work in an expeditious manner with the Upper Division states’ respective engineering and legal advisers to finalize each element of the final Emergency Upper Basin Contingency Plan for Commission review and approval before the need for such plan to be implemented arises.

  
FELICITY HANNAY, Chairperson  
United States of America

  
ERIC L. MILLIS  
State of Utah

  
AMY I. HAAS  
State of New Mexico

  
JOHN H. McCLEW  
State of Colorado

  
PATRICK T. TYRRELL  
State of Wyoming

RESOLUTION  
of the  
UPPER COLORADO RIVER COMMISSION  
December 10, 2014

Regarding Implementation of the 2014 System Conservation Pilot Program in the Upper Basin

WHEREAS, the Upper Colorado River Commission (Commission) was created by the Upper Colorado River Basin Compact (Compact) between the States of Arizona, Colorado, New Mexico, Utah and Wyoming on October 11, 1948, and consented to by Congress by the Act of April 6, 1949 (63 Stat. 31, Chapter 48);

WHEREAS, Article VIII of the Compact empowers the Commission to perform certain functions including, but not limited to:

- i. Engaging in cooperative studies of water supplies of the Colorado River and its tributaries;
- ii. Collecting, analyzing, correlating, preserving and reporting on data as to the stream flows, storage, and diversion of water from the Colorado River and its tributaries;
- iii. Making findings as to the quantity of water of the Upper Colorado River System used each year in the Upper Colorado River Basin and in each Upper Basin State;
- iv. Making findings on the quantity of water deliveries at Lee Ferry during each water year;
- v. Making findings as to the necessity for and the extent of the curtailment of use required, if any; and
- vi. Performing all functions required by the Compact and doing all things necessary, proper and convenient in the performance of its duties either independently or in cooperation with any state or federal agency;

WHEREAS, the Colorado River Storage Project Act and the Colorado River Basin Project Act authorized the Secretary of the Interior to construct and operate initial units consisting of Glen Canyon, Flaming Gorge, Curecanti (Aspinall), and Navajo, to, among other things, allow Colorado, New Mexico, Utah and Wyoming (collectively, "the Upper Division states") to utilize their share of the Colorado River and meet their obligations at Lee Ferry under the Colorado River Compact;

WHEREAS, Lake Powell serves as the primary storage facility for the Upper Division states to ensure ongoing compliance with the Colorado River Compact without curtailment of annual consumptive uses in the Upper Basin;

WHEREAS, the period 2000 through 2014 constituted the most severe 15 year drought in the long history of recordkeeping for the Colorado River Basin, leading to marked fluctuations in water elevations and low storage at Lake Powell and contributing to sustained decreases in water elevations and storage at Lake Mead;

WHEREAS, modeling of the Colorado River System projects the potential for water elevations at Lake Powell and Lake Mead to reach critically low levels if the current drought continues;

WHEREAS, the Upper Division states, through the Commission, have been working in parallel with the Lower Division states (Arizona, California, and Nevada) and in conjunction with the Department of the Interior to develop and implement drought contingency options, as appropriate to avoid reaching critical reservoir elevations at either Lake Powell or Lake Mead;

WHEREAS, four municipal water suppliers (Denver Water, Central Arizona Water Conservation District, Metropolitan Water District of Southern California, and Southern Nevada Water Authority) entered into an agreement with the Bureau of Reclamation (collectively the “System Conservation Partners”) on July 30, 2014 to fund a pilot program to test creation of system water through voluntary water conservation and reductions in use (System Conservation Agreement);

WHEREAS, neither the Commission nor the Upper Division states are parties to the System Conservation Agreement;

WHEREAS, the reported purpose of the projects funded by the System Conservation Agreement is to explore, learn from and determine if a voluntary, compensated reduction in consumptive use is a viable method to partially mitigate the decline of, or to raise, water levels in Lake Powell and Lake Mead, and, thereby, serve as a tool for the contingency planning processes in the Upper and Lower Colorado River Basins;

WHEREAS, the System Conservation Agreement contemplates a portion of the funding for the pilot program be dedicated to projects in the Upper Colorado River Basin to better understand whether and how voluntary reductions in consumptive use could help protect critical levels at Lake Powell during extended drought;

WHEREAS, it is important for the development and implementation of the System Conservation pilot program in the Upper Basin to be coordinated with the rights and authorities held by the Commission, each of the Upper Division states, and the federal government;

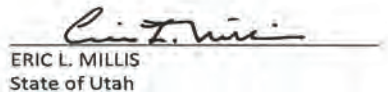
WHEREAS, according to the System Conservation Agreement, approval of the Governor’s representative of the Upper Division state in which the proposed project is located is required before a pilot project can be approved and implemented in the Upper Colorado River Basin;

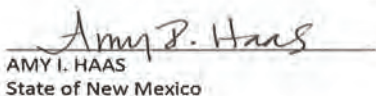
WHEREAS, the Governor’s representatives currently appointed in the Upper Colorado River Basin also serve as commissioners to the Commission; and

WHEREAS, the Commission finds that a pilot program like that contemplated by the System Conservation Agreement may provide useful information and experience that could inform the Upper Basin emergency drought contingency planning process.

NOW, THEREFORE, BE IT RESOLVED that, considering the recitals outlined above, the Commission supports application of the System Conservation Agreement and commits to coordinate with the System Conservation Partners to establish and implement a pilot program in the Upper Basin to the greatest extent possible.

  
FELICITY HANNAY, Chairperson  
United States of America

  
ERIC L. MILLIS  
State of Utah

  
AMY L. HAAS  
State of New Mexico

  
JOHN H. McCLELL  
State of Colorado

  
PATRICK T. TYRRELL  
State of Wyoming

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# Upper Colorado River Commission

## **APPENDIX D**

# **TRANSMOUNTAIN DIVERSIONS**



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TRANSMOUNTAIN DIVERSIONS  
FROM COLORADO RIVER  
BASIN IN COLORADO  
1994-2015

TO PLATTE RIVER BASIN															10YEAR AVERAGE
1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	
Grand River Ditch	17,870	19,808	23,260	17,948	0	9,363	8,326	9,390	2,541	7,376	21,217	19,542	20,432	22,098	16,823
Eureka Ditch	0	180	0	0	0	0	0	0	0	0	0	0	0	0	0
Alva B. Adams Tunnel	233,200	238,500	201,300	229,000	165,640	119,660	131,931	286,000	86,571	122,770	162,911	273,118	233,868	287,330	235,704
Berthoud Pass Ditch	874	815	1,530	2,610	1,570	0	268	244	298	202	839	720	702	702	629
Meliss Water Tunnel	43,310	24,220	51,050	50,880	38,320	38,330	34,353	35,070	36,510	30,862	56,274	86,031	43,341	76,912	47,941
Boreas Pass Ditch	83	0	209	282	178	249	62	95	88	21	133	177	187	171	156
Vader Tunnel	485	760	268	420	425	580	167	186	220	194	516	641	714	1,059	712
Harold D. Roberts Tunnel	73,890	52,176	38,920	53,480	40,380	47,377	53,263	130,500	38,027	45,699	59,233	111,409	41,392	76,912	64,382
Straight Creek Tunnel	330	320	399	393	295	386	190	163	183	164	361	347	226	286	271

TO ARKANSAS RIVER BASIN

Hosler Pass Tunnel	9,188	4,532	12,306	8,312	10,400	10,115	6,226	5,294	3,400	3,671	3,266	10,034	12,276	6,121	10,965	8,282
Columbine Ditch	1,470	2,390	2,500	1,730	1,669	933	1,740	1,790	780	1,940	1,210	1,530	1,940	1,830	87	8,282
Ewing Ditch	796	1,410	1,440	1,330	759	618	1,020	936	192	1,030	499	784	963	1,040	1,440	1,030
Wurtz Ditch	2,073	4,241	4,210	4,180	2,183	1,230	2,600	2,230	647	2,400	1,550	2,300	2,920	2,360	1,280	1,034
Homestead Tunnel	24,230	23,505	38,690	37,130	23,316	31,420	24,140	35,770	26,510	9,930	23,150	23,920	20,880	26,820	50,510	20,776
Twin Lakes Tunnel	42,850	33,120	34,850	34,190	47,441	16,580	42,060	45,650	20,570	45,240	35,550	50,160	54,677	54,470	64,540	43,360
Charles H. Bousheas Tunnel	55,040	91,300	39,540	79,380	53,965	43,440	50,690	50,530	15,780	57,999	28,590	55,610	62,340	55,220	90,790	43,360
Buck-Ivanhoe Tunnel	4,100	5,817	2,450	4,640	4,174	5,070	5,240	5,330	2,680	5,090	5,270	5,170	4,830	4,310	4,880	4,185
Larspur Ditch	146	116	60	185	67	6	7	63	0	0	76	171	221	397	461	68,137

TO RIO GRANDE BASIN

Tarbell Ditch	207	68	368	753	630	1,700	750	532	0	330	693	1,120	231	993	902	511	293
Tabor Ditch	639	1,240	375	1,340	1,010	1,430	495	254	87	323	250	1,050	801	1,270	1,050	827	517
Treasure Pass Ditch	94	0	15	245	223	367	70	29	0	185	150	337	71	200	121	262	424
Don La Font Ditches No. 1 & 2	364	50	112	64	0	0	10	0	0	0	0	54	0	269	218	154	347
Williams Creek-Squaw Pass Ditch	279	374	124	421	289	746	230	199	81	226	200	632	358	466	328	257	199
Pine River-Weminuche Pass Ditch	172	672	42	1,050	396	1,100	203	212	0	103	100	200	390	577	360	352	384
Weminuche Pass Ditch	0	0	0	1,090	459	3,400	0	0	0	64	50	508	241	1,050	743	847	517
TOTAL	511,670	505,614	457,018	531,053	440,780	383,260	338,054	377,404	514,515	292,967	307,892	665,653	492,323	670,445	554,545	523,046	527,320

TRANSMOUNTAIN DIVERSIONS  
FROM COLORADO RIVER BASIN  
IN COLORADO TO RIO GRANDE  
BASIN IN NEW MEXICO  
1994-2015

San Juan-Chama Diversion	82,300	85,100	57,259	141,174	96,701	118,901	42,741	110,582	6,510	62,707	84,884	152,624	71,722	118,860	145,946	106,382	91,693
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**TRANSMOUNTAIN DIVERSIONS  
FROM COLORADO RIVER  
BASIN IN UTAH**

1994-2015

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	10 YEAR AVERAGE
<b>TO GREAT BASIN</b>																							
Broadbent Supply Ditch (Wyoming)									2,892	1,101	912	1,101	1,217	1,551	2,044	1,456	984	367	377	507	880	1,000	1,034
Fairview Tunnel	2,049	2,445	2,830	2,009	1,985	1,617	1,844	1,959	1,182	2,459	1,571	2,345	2,563	1,515	2,630	1,429	1,300	2,032	2,175	1,881	2,078	1,332	1,894
Ephraim Tunnel	1,004	2,629	2,132	3,399	2,395	2,444	1,648	3,049	2,804	2,862	3,891	4,874	4,532	3,000	3,000	4,221	7,120	1,522	2,145	1,742	2,078	3,412	3,337
Spring City Tunnel	1,334	2,670	2,824	2,571	1,519	798	1,068	1,819	1,457	3,013	1,737	3,321	3,004	2,755	2,755	2,800	2,850	4,908	3,421	4,023	4,344	4,171	3,508
Central Utah Project, Bonneville Unit*	18,987	11,933	11,891	12,385	5,006	16,863	3,707	3,954	46,889	42,715	33,881	75,670	33,617	33,606	38,834	37,228	33,233	38,780	27,817	36,437	43,815	44,345	36,871
Hobble Creek Ditch	684	825	590	972	800	740	0	184	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Strawberry Willow Creek Ditch	962	953	1,379	1,706	1,554	667	1,239	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Strawberry Water Users Association*	74,190	36,768	51,934	41,576	52,821	61,297	76,038	80,873	69,419	58,570	62,892	49,824	47,791	68,906	86,297	45,971	66,740	38,418	71,817	69,600	60,723	63,264	61,853
Duchene Tunnel	22,817	39,659	31,895	39,446	30,746	33,429	28,482	28,739	20,767	28,857	27,278	29,008	21,454	29,496	26,607	29,492	27,128	10,581	20,712	24,144	42,769	28,038	26,457
<b>TOTAL</b>	121,637	98,082	105,475	104,064	96,826	117,856	114,592	120,587	143,440	139,577	132,012	186,143	114,178	140,829	162,167	122,597	133,365	97,607	128,463	138,334	157,238	147,163	134,694

**TRANSMOUNTAIN DIVERSIONS  
FROM GREAT BASIN  
TO COLORADO RIVER  
BASIN IN UTAH**

1994-2015

Tropic and East Fork Canal	4,801	7,022	4,542	5,442	6,922	6,689	3,413	6,153	2,333	2,712	2,431	4,500	4,884	4,469	5,319	4,258	5,329	4,687	5,100	5,640	3,115	4,444	4,723
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**TRANSMOUNTAIN DIVERSIONS  
FROM COLORADO RIVER  
BASIN TO NORTH PLATTE  
BASIN IN WYOMING**

1994-2015

City of Cheyenne	14,405	12,144	17,014	14,119	14,870	13,252	15,327	12,583	6,688	16,745	13,502	17,464	16,880	12,061	18,519	10,903	11,608	5,262	5,754	12,784	8,003	5,945	10,694
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**TRANSMOUNTAIN DIVERSIONS  
FROM  
COLORADO RIVER BASIN**

1994-2015

<b>TOTAL</b>	728,312	697,018	635,304	788,088	645,355	629,669	510,401	618,083	673,700	512,384	538,959	792,259	668,849	762,704	994,857	819,228	739,190	805,395	738,537	712,577	688,791	519,680	762,779
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Based on preliminary transflow records obtained from U. S. Bureau of Reclamation, U. S. Geological Survey, Central Utah Water Conservancy District, Colorado Division of Water Resources, New Mexico Interstate Stream Commission, and Wyoming State Engineer's Office - subject to revision. Streamgaging of the following small transmountain diversions in Utah were discontinued in 1999, flows are estimated as:

Candland Ditch - 200 acre-feet, Horseshoe Tunnel - 600 acre-feet, Larsen Tunnel - 600 acre-feet, Coal Fork Ditch - 260 acre-feet, Twin Creek Ditch - 200 acre-feet, and John August Ditch - 200 acre-feet. These diversions are from the San Rafael River in the Colorado River Basin to the Great Basin in Utah and total about 3,100 acre-feet annually.

Does not include diversions for management Continental Divide Ditch which services 437 acres or Ranger Ditch which services 391 acres.

\* Part of the Strawberry Reservoir to Bonneville Basin trans-mountain diversions

This import is subtracted from the sum of exports.

\* Part of the Strawberry Reservoir to Bonneville Basin trans-mountain diversions