

OPERATING AGREEMENT  
FOR THE RIO GRANDE PROJECT

THIS OPERATING AGREEMENT ( " Agreement " ) is entered into this <sup>12</sup>10<sup>th</sup> day of ~~March~~ 2008, by and among the United States of America, by and through the Bureau of Reclamation ( " United States " or " Reclamation " or " USA " ) acting pursuant to the Reclamation Act of June 17, 1902, 32 Stat. 390, as amended and supplemented; the Elephant Butte Irrigation District ( " EBID " ), an irrigation district and a quasi municipal corporation in the State of New Mexico, incorporated and organized under New Mexico law, N.M.S.A. 1978, § 73 10 1 et seq. (1985 Repl. Pamp.); and the El Paso County Water Improvement District No. 1 ( " EPCWID " ), a political subdivision of the State of Texas, under Art. XVI, § 59 of the Texas Constitution (collectively, " the Parties " to this Agreement).

NOW THEREFORE, the Parties recognize the following terms and conditions to constitute an operational plan for the Rio Grande Project and the Parties agree as follows:

**1 DEFINITIONS**

When used in this Agreement, unless otherwise distinctly expressed or manifestly incompatible with the intent hereof, the following definitions shall apply:

**1.1. Normal Annual Release**

A Normal Annual Release from Project Storage for all authorized uses is 790,000 acre-feet as measured at the first gauging station downstream of Caballo Dam. It is possible that during any Water Year the aggregate quantity of water released for EBID and EPCWID, and for the United States (pursuant to the Convention of 1906), including release of Carryover Water for EBID and EPCWID, may be more or less than the Normal Annual Release from Project Storage of 790,000 acre-feet.

**1.2. Project-Authorized Acreage**

There are 159,650 authorized acres within the Project. Of the Project Authorized Acreage, 90,640 acres are within EBID and 69,010 acres are within EPCWID.

**1.3. Project Storage**

Elephant Butte Reservoir, Caballo Reservoir, and such additional storage facilities (less flood control space) as may be authorized by Congress or provided for pursuant to the Rio Grande Compact (Act of May 31, 1939, 53 Stat.785).

#### **1.4. Rio Grande Project**

The Project was authorized by an Act of Congress on February 25, 1905, 33 Stat. 814, pursuant to the Reclamation Act of 1902, 32 Stat. 390. The Project includes facilities and works with their appurtenant lands authorized by the Act of February 25, 1905, as amended and supplemented, particularly Elephant Butte Dam and Reservoir, Caballo Dam and Reservoir, a power generating plant, and six diversion dams (Percha, Leasburg, Mesilla, American, International, and Riverside) on the Rio Grande in New Mexico and Texas, and includes the Project lands and service area authorized for water delivery pursuant to the Rio Grande Project Act of February 25, 1905, as amended and supplemented and the Reclamation Act of 1902 as amended and supplemented.

#### **1.5. Water Year**

The water year shall be a calendar year beginning on the first day of January and ending on the thirty-first day of December.

#### **1.6. Project Water**

Project Water, as used herein, shall mean: 1) usable water in Project Storage; 2) all water required by the Rio Grande Compact of 1938 to be delivered into Elephant Butte Reservoir; and 3) all water released from Project Storage and all inflows reaching the bed of the Rio Grande between Caballo Dam, New Mexico and Fort Quitman, Texas.

#### **1.7. Annual Allocated Water**

Annual Allocated Water is the quantity of Project Water that is determined by United States, in accordance with this Agreement, the Operations Manual, and in consultation with EBID and EPCWID, to be allocated each Water Year for delivery to EBID and EPCWID, and to the United States (pursuant to the Convention of 1906).

#### **1.8. Carryover Water**

Carryover Water is the Annual Allocated Water allotment balance remaining on the water account for each district at the end of a given Water Year. EBID and EPCWID shall have the right to carry over any amount of their respective Annual Allocated Water subject to provisions of Section 1.10 herein.

#### **1.9. Actual Carryover Water**

Actual carryover water is the increase in a district's allocation due to applying carryover water amounts for each district in the allocation calculations.

### **1.10 Carryover Limit**

Actual carryover water may be accumulated in an account for each district to a maximum of sixty percent (60%) of each district's respective full yearly allocation or an amount of actual carryover water equal to 232,915 acre-feet for EPCWID and 305,918 acre-feet for EBID.

### **1.11 Excess Carryover Balance**

At the end of the water year, either district's carryover balance in excess of its respective carryover limit shall be transferred to the carryover account of the other district. If both districts' carryover limits are exceeded, each district's carryover balance shall be equal to its respective limit.

### **1.12 Rio Grande Project Water Accounting and Operations Manual (Operations Manual)**

The United States, EBID, and EPCWID shall produce an Operations Manual. The Operations Manual shall contain detailed information regarding the methods, equations, and procedures used by EBID, EPCWID, and the United States to account for all water charges and operating procedures for the Rio Grande Project. This Agreement shall be effective upon execution regardless of the status of the Operations Manual.

### **1.13 Non-Allocated Water**

Project Water is available for diversion from the Rio Grande by EBID or EPCWID that is not charged by the United States against any allocation account. Non-Allocated water is typically available only during periods when no water is being released from storage or during flood events.

## **2. ALLOCATION OF PROJECT WATER**

### **2.1. Use of Project Water**

All Project Water in Project Storage, including any actual Carryover Water shall be used for the authorized purposes set forth in the Reclamation Act of June 17, 1902, 32 Stat. 390, and the Rio Grande Project Act of February 25, 1905, 33 Stat. 814, as amended and supplemented.

### **2.2. Determination of Project Water in Project Storage**

At the beginning of each Water Year and during each month of the Water Year, The United States shall determine the total quantity of Project Water in Project Storage.

**2.3. Determination of Annual Allocation to Mexico, EBID, and EPCWID**

The United States shall determine the quantity of Annual Allocated Water to Mexico, EBID, and EPCWID by the first of December for the following Water Year utilizing the Project Water in storage amounts and Carryover Water amounts for each district. The United States may reconsider the Annual Allocated Water each month during a Water Year and adjust it as necessary in consultation with EBID and EPCWID in accordance with this Agreement.

**2.4. Annual Allocation for United States for delivery to Mexico**

The portion of the Annual Allocated Water which shall be allocated for the United States to meet its obligations pursuant to the Convention of 1906 shall be 11.3486 percent (11.3486%) of the sum of the quantity of Project Water delivered to lands in the United States plus the quantity of Project Water delivered to the head works of the Acequia Madre in acre-feet per Water Year as set forth in equation 2-1 and Table 1 that follow:

$$Y = 0.8260932 (X) - 102,305 \tag{2-1}$$

where X = Annual Released Water (in acre-feet per Water Year), and Y = sum of the quantity of Project Water delivered to lands in the United States plus the quantity of Project Water delivered to the head works of the Acequia Madre (in acre-feet per Water Year).

Table 1

Annual Amount of Water Released from Caballo Reservoir (ac-ft/acre)	Sum of the quantity of Project Water delivered to lands in the United States plus the quantity of Project Water delivered to the head works of the Acequia Madre (in acre-feet per Water Year).	Quantity of Project Water delivered to the head works of the Acequia Madre (in acre-feet per Water Year).
790,000	550,309	60,000
763,842	528,700	60,000
700,000	475,960	54,015
650,000	434,656	49,327
600,000	393,351	44,640
550,000	352,046	39,952
500,000	310,742	35,265
450,000	269,437	30,577
400,000	228,132	25,890
350,000	186,828	21,202
300,000	145,523	16,515
250,000	104,218	11,827
200,000	62,914	7,140

The United States shall be entitled to release all or such portion of the Annual Allocated Water which has been allocated for the United States as it deems necessary to meet the

requirement of the Convention of 1906 to deliver water in the bed of the Rio Grande at the head works of the Acequia Madre.

## **2.5. Annual Allocation for EBID and EPCWID**

EBID's and EPCWID's portions of the quantity of Annual Allocated Water, exclusive of the United States' portion of Annual Allocated Water pursuant to the Convention of 1906, shall be determined by the process described in Table 2 for a full allocation condition and Table 3 when there is less than a full water supply available. EBID's and EPCWID's yearly allocation shall be determined using the empirically derived linear regression analysis equation (D-2). Equation D-2 was derived using historical Rio Grande Project data correlating releases from Rio Grande Project storage and corresponding yearly deliveries to Rio Grande Project diversions from the Rio Grande for EBID, EPCWID and Mexico during the Water Years 1951 to 1978 inclusive. The amount of Annual Allocated Water shall be determined using the D-2 equation for EPCWID, using equation 2-1 for the United States (pursuant to the Convention of 1906), and using the diversion ratio (ratio of the amount of water Charged to the amount of water Released) for EBID and in accordance with Tables 1 through 4 herein.

Table 2 – Rio Grande Project Hypothetical Example of Full Allocation

1	<b>Rio Grande Project Diversion Allocations</b>	<b>ac-ft</b>
2	Elephant Butte Reservoir Storage	1,000,000
3	Caballo Reservoir Storage	44,005
4	Total Rio Grande Project Storage	1,044,005
5	Estimated Rio Grande Compact Credit Waters	(196,000)
6	Estimated San Juan-Chama Water	(4,553)
7	Water Released from Storage	-
8	Total Usable Water Available for Release	843,452
9	Carryover Obligation using Estimated Diversion Ratio	14,654
10	Total Usable Water Available for Current Year Allocation	790,000
11	EBID Allocation Balance (Previous Year)	10,000
12	EPCWID Allocation Balance (Previous Year)	5,000
13	EBID Estimated Allocation Balance (End-of-Year)	-
14	EPCWID Estimated Allocation Balance (End-of-Year)	-
15	Storage for EBID and EPCWID Estimated Allocation Balance (End-of-Year)	-
16	Estimated Release of Current Usable Water	804,654
17	Estimated End-of-Year Release for Diversion Ratio	781,208
18	D1 Delivery	562,414
19	Mexico's Current Diversion Allocation	60,000
20	Gross D2 Diversion Allocation	972,709
21	EPCWID ACE Conservation Credit	-
22	Net D2 Diversion Allocation for EBID and EPCWID	912,709
23	D2 Diversion Allocation for EPCWID	394,526
24	EPCWID Diversion Allocation (w/o Conservation Credit)	399,526
25	EPCWID Diversion (w/o Conservation Credit or 67/155ths of Row 30)	399,526
26	Diversion Ratio	1.023633
27	Diversion Ratio Adjustment	19,017
28	Sum of Release and Diversion Ratio Adjustment	823,670
29	EBID D2 Diversion Allocation	518,183
30	Difference between EBID Diversion Ratio Allocation and D2 Diversion Allocation	-
31	EBID Diversion Ratio Allocation	354,144
32	EBID Diversion Allocation	354,144
33	Total EBID Diversion Allocation (includes 88/155th of Value in Row 30)	364,144
34	Total EPCWID Allocation (includes Row 21 and 67/155th of Value in Row 30)	399,526
35	Total EBID, EPCWID, and Mexico Allocation	823,670

Table 3 – Rio Grande Project Hypothetical Example of Less than Full Allocation

1	Rio Grande Project Diversion Allocations	ac-ft
2	Elephant Butte Reservoir Storage	408,773
3	Caballo Reservoir Storage	23,772
4	Total Rio Grande Project Storage	432,545
5	Estimated Rio Grande Compact Credit Waters	(187,800)
6	Estimated San Juan-Chama Water	(4,053)
7	Water Released from Storage	-
8	Total Usable Water Available for Release	240,692
9	Carryover Obligation using Estimated Diversion Ratio	112,931
10	Total Usable Water Available for Current Year Allocation	127,761
11	EBID Allocation Balance (Previous Year)	-
12	EPCWID Allocation Balance (Previous Year)	106,982
13	EBID Estimated Allocation Balance (End-of-Year)	-
14	EPCWID Estimated Allocation Balance (End-of-Year)	-
15	Storage for EBID and EPCWID Estimated Allocation Balance (End-of-Year)	-
16	Estimated Release of Current Usable Water	240,692
17	Estimated End-of-Year Release for Diversion Ratio	600,000
18	D1 Delivery	96,529
19	Mexico's Current Diversion Allocation	10,955
20	Gross D2 Diversion Allocation	80,948
21	EPCWID ACE Conservation Credit	-
22	Net D2 Diversion Allocation for EBID and EPCWID	69,994
23	D2 Diversion Allocation for EPCWID	30,255
24	EPCWID Diversion Allocation (w/o Conservation Credit)	137,237
25	EPCWID Diversion (w/o Conservation Credit or 67/155ths of Row 30)	137,237
26	Diversion Ratio	0.947320
27	Diversion Ratio Adjustment	(12,680)
28	Sum of Release and Diversion Ratio Adjustment	228,012
29	EBID D2 Diversion Allocation	39,738
30	Difference between EBID Diversion Ratio Allocation and D2 Diversion Allocation	40,082
31	EBID Diversion Ratio Allocation	79,820
32	EBID Diversion Allocation	39,738
33	Total EBID Diversion Allocation (includes 88/155th of Value in Row 30)	62,495
34	Total EPCWID Allocation (includes Row 21 and 67/155th of Value in Row 30)	154,563
35	Total EBID, EPCWID, and Mexico Allocation	228,012

Table 4 Description of Values and Calculations Tables 2 and 3

Row	Description	Source of Value	Equation
1	Rio Grande Project Diversion Allocations	NA	NA
2	Elephant Butte Reservoir Storage	USBR	NA
3	Caballo Reservoir Storage	USBR	NA
4	Total Rio Grande Project Storage	Calculated	[2]+[3]
5	Estimated Rio Grande Compact Credit Waters	USBR	NA
6	Estimated San Juan-Chama Water	USBR	NA
7	Water Released from Storage	USBR	NA
8	Total Usable Water Available for Release	Calculated	[4] + [5] + [6] + [7]
9	Carryover Obligation using Estimated Diversion Ratio	Calculated	(((11) + [12]) / [26])
10	Total Usable Water Available for Current Year Allocation	Calculated	MIN(790000,[8] - [9])
11	EBID Allocation Balance (Previous Year)	EPCWID, EBID, USBR	NA
12	EPCWID Allocation Balance (Previous Year)	USBR	NA
13	EBID Estimated Allocation Balance (End-of-Year)	EBID	NA
14	EPCWID Estimated Allocation Balance (End-of-Year)	EPCWID	NA
15	Storage for EBID and EPCWID Estimated Allocation Balance (End-of-Year)	Calculated	(((14)+[13]) / [26])
16	Estimated Release of Current Usable Water	USBR	[10] + [9] - [15]
17	Estimated End-of-Year Release for Diversion Ratio	USBR	NA
18	D1 Delivery	Calculated	MAX(0,((16)*0.8260932) - 102305)
19	Mexico's Current Diversion Allocation	Calculated	MIN(60000,[18]*0.113486)
20	Gross D2 Diversion Allocation	Calculated	MIN(763842,[10])*1.3377994-89970+MAX(0,[16]-763842)
21	EPCWID ACE Conservation Credit	USBR	NA
22	Net D2 Diversion Allocation for EBID and EPCWID	Calculated	[20] - [19]
23	D2 Diversion Allocation for EPCWID	Calculated	[22] * 67 / 155
24	EPCWID Diversion Allocation (w/o Conservation Credit)	Calculated	[23] + [12]
25	EPCWID Diversion (w/o Conservation Credit or 67/155ths of Row 30)	Calculated	[24] - [14]
26	Diversion Ratio	Calculated	0.00000042113634*[17]+0.6946382
27	Diversion Ratio Adjustment	Calculated	(((26) - 1) * [18])
28	Sum of Release and Diversion Ratio Adjustment	Calculated	[16] + [27]
29	EBID D2 Diversion Allocation	Calculated	[22] * 88 / 155
30	Difference between EBID Diversion Ratio Allocation and D2 Diversion Allocation	Calculated	IF([16]<600000,MAX(0,[31]-[29]),0)
31	EBID Diversion Ratio Allocation	Calculated	[28] - [25] - [19] - [11] - [21]
32	EBID Diversion Allocation	Calculated	IF([16]<600000,MIN([29],[31]),[31])
33	Total EBID Diversion Allocation (includes 88/155th of Value in Row 30)	Calculated	[32]+[11]+88/155*[30]
34	Total EPCWID Allocation (includes Row 21 and 67/155th of Value in Row 30)	Calculated	[24]+[30]*67/155+[21]
35	Total EBID, EPCWID, and Mexico Allocation	Calculated	[34]+[33]+[19]

### **3. RELEASE FROM STORAGE**

#### **3.1. Orders for Release of Rio Grande Project Water from Storage**

EBID and EPCWID may order releases from Project storage to meet their respective delivery requirements of Annual Allocated Water or Carryover Water at their river headings during the Water Year at such times and in such quantities as they respectively elect. Water orders shall be delivered by the United States to their respective diversion and delivery points as prescribed by agreed to travel times, or as described in the Operations Manual when completed. EBID shall not order changes more frequently than four times per week. EPCWID shall not order changes more frequently than twice per week.

EBID and EPCWID shall determine the amount of water to be released from Caballo Reservoir necessary to meet the diversion orders at the time and days requested by EBID, EPCWID, and the United States (pursuant to the Convention of 1906). If EBID and EPCWID cannot agree on the amount or timing of release, then the United States shall make such determinations.

The parties shall develop a schedule of order changes that will best meet the needs of each party at their respective delivery points.

The United States shall only release Project Water ordered by EBID when EBID has Annual Allocated Water or Carryover Water remaining in their allocation. The United States shall only release Project Water ordered by EPCWID when EPCWID has Annual Allocated Water or Carryover Water remaining in their allocation.

The Parties may make non-scheduled order changes to adjust for rainfall/runoff or flood events, accident to the delivery system, or for public safety.

The United States may make releases from storage in such quantities as necessary to meet the requirements of the Convention of 1906 and according to the schedule determined by the United States under the authority of the Convention of 1906.

### **4. DELIVERIES**

#### **4.1. Operation of Release and Diversion Structures**

The United States shall operate Elephant Butte Reservoir so as to provide for sufficient quantities of water to be available for released from Caballo Reservoir to the Parties, as outlined in Section 3.1 herein. The United States or its designee shall operate Percha, Leasburg, and Mesilla diversion dams so as to provide sufficient flows for the districts'

diversions on the Rio Grande. The United States shall operate the American and International diversion dams and make the diversions into the American Canal.

#### **4.2. Obligations to Deliver Project Water**

Within a reasonable amount of time from the time requested for the release by EBID and EPCWID, or as defined in the Operations Manual when completed, the United States shall release from project storage those quantities of Project Water which will meet the individual requirements of each district as communicated in their water order to the United States to be delivered at the Arrey Canal Heading, Leasburg Canal Heading, Eastside Canal Heading, Westside Canal Heading, Del Rio Lateral Heading and any additional authorized points of delivery for EBID, and to be delivered to the Franklin Canal Heading, the Riverside Canal Heading, the City of El Paso 's water treatment plants and any additional authorized points of delivery for EPCWID. Within a reasonable of amount time from the time requested for the delivery, or as defined in the Operations Manual when completed, the United States shall deliver those quantities of Project Water in the Rio Grande at the head works of the Acequia Madre in accordance with the orders designated by the United States.

### **5. FLOW REQUIREMENTS**

#### **5.1. Order**

An " Order " is a request to the United States by a Party to deliver a quantity of Project Water to each district's delivery and accounting stations at a specific flow rate (cubic feet per second) and at specified delivery time and day.

#### **5.2. Release**

A " Release " is a flow rate (cubic feet per second) of Project Water released from Project Storage.

#### **5.3. Delivered Flow**

A " Delivered Flow " is a flow rate (cubic feet per second) of Project Water that meets the conditions required to meet the delivery requirement for each district and Mexico at their designated delivery point or metering stations (stations) and at specified delivery time and day.

#### **5.4. Charge**

A “ Charge ” is a quantity of Project Water (acre-feet) that is deducted from (i.e. charged against) a Party’s Annual Allocated or actual Carryover Water account.

#### **5.5. Charge Against EBID’s and EPCWID’s Annual Allocated Water including Carryover Water**

EBID ’s and EPCWID ’s remaining Annual Allocated Water shall be computed by subtracting a Charge which shall be equal to EBID ’s or EPCWID ’s respective delivery at main canal headings and any other designated and authorized metering stations at the Rio Grande diversion dams against their respective remaining portion of Annual Allocated Water including carryover water.

Allocation charges for water diverted by EPCWID, EBID, and Mexico shall be made as follows, or in accordance with the procedures and methods contained in the Operations Manual when completed.

1. EBID and EPCWID shall report to the United States the flow records for their respective diversion and water delivery stations for each month by the 5<sup>th</sup> day of the following month.
2. The reports may be transmitted electronically by any party to the other parties.
3. The United States shall report to EBID and EPCWID the previous month’s Allocation Charges and the cumulative year-to-date Allocation Charges for EBID, EPCWID, and the United States by the 10<sup>th</sup> day of the month.

A hypothetical example of summary tables of the Allocation Charges for EBID and EPCWID is contained in Appendix A attached here to.

Water diverted from the Rio Grande by EBID may be returned (bypassed) to the Rio Grande for credit to their water allocation account at one designated location each within the Leasburg, Eastside, and Westside canal system, and two designated locations within the Arrey Canal system. Water diverted from the Rio Grande by EPCWID may be returned (bypassed) to the Rio Grande for credit to their water allocation account at one designated location on the La Union East Canal. Such credits shall be the smaller of the amount of water declared for bypass by the respective district or the actual amount of water that was measured and returned to the Rio Grande.

The United States shall make every effort to match the delivery and the order for each district at all designated metering and delivery stations in order to minimize spill water and meet the order at any given time.

**5.6. Charge Against United States' Annual Allocated Water for Delivery to Mexico**

United States' remaining quantity of Annual Allocated Water shall be equal to United States' previous allocation of Annual Allocated Water during the current Water Year minus the water delivered to Mexico at their diversion point on the Rio Grande at the Acequia Madre during the Water Year. The United States will maintain the gates at the International Dam so as to minimize the leakage to the greatest extent practical.

**5.7. Compliance with Delivery of Project Water to Mexico at the Acequia Madre**

If the flow at the first metering station above International Diversion Dam does not meet the Acequia Madre delivery requirement, the United States will adjust the gates at American Diversion Dam to reduce the flow to meet the corresponding delivery requirement for that day. The United States will give notice to EBID and EPCWID of such action except when such flow is due to storm runoff or flood events, short term debris clearing or sluicing operations. Any time the United States manually adjusts the flow at the American Diversion Dam by more than 25 cfs, for any reason, or at anytime the flow diverted at the American Diversion Dam into the American Canal exceeds the capacity of the American Canal, United States shall notify EPCWID as soon as possible.

**5.8. Diversion Points**

The diversion points used for EBID are as follows: Percha Lateral, Arrey Canal, Leasburg Canal, California Extension, various designated river pumps, Del Rio Lateral, East Side Canal, and West Side Canal. The diversion points used for the EPCWID are as follows: the New Mexico/Texas state line crossings for the La Union East Lateral, Three Saints Lateral, and La Union West lateral in the Mesilla Valley. In the El Paso Valley, deliveries to EPCWID will be made at the Robertson/Umbenhauer Water Treatment Plant, Franklin Canal, Jonathan Rogers Water Treatment Plant, and Riverside Canal.

**5.9. Compliance with Delivery of Project Water to EBID and EPCWID**

The United States shall closely match the order and diversion at each designated delivery metering station through close monitoring of releases from Project Storage and river accretions or losses. Close coordination and daily communication shall be maintained between EBID, EPCWID, and the United States in order to make adjustments to releases

from Project Storage such that water deliveries match water order amounts as closely as possible at each delivery point in the Project.

## **6. GENERAL PROVISIONS**

### **6.1. Compliance with Federal Law**

The terms of this Agreement are subject to applicable federal law. All Parties will cooperate to comply with all federal law prior to and during implementation of this Agreement.

### **6.2. Other Agreements**

This Agreement is not intended to conflict with terms of any prior agreements or contracts between the EBID and EPCWID, or EBID and the United States, or EPCWID and the United States, or among all of the Parties; however, the Agreement represents the current conditions and present understanding that future operations shall be as provided for herein unless further modified upon having reached unanimous consent of the Parties.

### **6.3. Required Continuous Flow Metering Stations**

A list of required continuous flow metering stations is attached to this Agreement as Appendix B. Each Party shall distribute and exchange copies of all flow records for all flow metering stations for which it is responsible, as listed in Appendix B, among the other Parties at least monthly with a goal of real time data exchanges.

### **6.4. Regulating Reservoirs Downstream of Caballo Dam**

Nothing in this Agreement shall be interpreted to prohibit the construction and/or operation of an off-channel regulating reservoir, providing however that no such reservoir shall affect the water order or delivery requirements of the Parties under this Agreement.

### **6.5. Emergency Conditions (Force Majeure)**

If any Party through no fault of its own is rendered unable, wholly or in part, by Force Majeure to carry out its obligations under this Agreement, then the obligations of such Party, so far as they are affected by such Force Majeure, shall be suspended during the time reasonably necessary to remedy such inability, but for no longer period. The term "Force Majeure" shall mean acts of God, wars, terrorism, vandalism, insurrections, riots, epidemics, landslides, lightning, earthquakes, fires, storms, floods, hazardous spills, or explosions.

**6.6. Term of Agreement**

This Agreement shall be in effect from January 1, 2008 until December 31, 2050.

**6.7. Modification of Agreement**

The Parties may modify any provisions of this Agreement upon having reached unanimous consent.

**6.8. Assignment Limited - Successors and Assigns Obligated**

The provisions of this Agreement shall apply to and bind the successors and assigns of the Parties hereto. No assignment of any right or obligation shall be made by any Party without first obtaining written approval by the other Parties.

**6.9. Obligations to Indian Tribes Not Affected**

Nothing in this Agreement shall be construed as affecting the obligations of the United States of America to the Indian Tribes, or as impairing the rights of the Indian Tribes.

**6.10. Obligations to Mexico Not Affected**

Nothing in this Agreement shall be construed as affecting the obligations of the United States of America to Mexico under existing treaties.

**6.11. Amendment of Agreement**

This Agreement shall be reviewed for improvement of operations at least on an annual basis or as agreed to by the majority of the parties. Any of the parties may submit a written request to the other parties for review of this Agreement at any time.

**6.12. Rio Grande Compact**

Nothing herein is intended to alter, amend, repeal, modify, or be in conflict with the provisions of the Rio Grande Compact.

**APPENDIX A – Hypothetical Example of Allocation Charges for EBID and EPCWID**

The tables below are hypothetical examples of summary tables of Allocation Charges for EBID and EPCWID. The Operations Manual, when completed, shall contain detailed information regarding the methods, equations, and procedures used by EBID, EPCWID, and the United States to account for all water charges and operating procedures for the Rio Grande Project.

**EPCWID Diversion Allocation Charges**

Diversion Location	Metered Volume	Adjustment for Conveyance Losses for NM Deliveries	Diversion Allocation Charges for Month	Beginning-of-Month Totals	End-of-Month Totals
	ac-ft	ac-ft	ac-ft	ac-ft	ac-ft
L U E Canal - TX	2,395	95%	2,275	17,065	19,340
L U W Canal - TX	947	95%	900	6,620	7,520
Three Saints Lateral	134	100%	134	1,426	1,560
<b>Total Mesilla Valley (Texas)</b>			<b>3,309</b>	<b>25,112</b>	<b>28,420</b>
Umbenhauer/Robertson Water Treatment Plant	3,345	100%	3,345	16,701	20,046
Franklin Canal	7,400	100%	7,400	39,293	46,694
United States - Ysleta del Sur Agreement	0	100%	0	200	200
United States Section - IBWC (Construction Water)	1	100%	1	22	23
Jonathan W. Rogers Water Treatment Plant	4,666	100%	4,666	27,747	32,413
Riverside Canal	20,079	100%	20,079	125,831	145,910
Haskell R. Street WWTP Effluent	-1,599	100%	-1,599	-8,180	-9,779
Credit for Diversions greater than Orders (EP Valley)	-2,790	100%	-2,790	-3,233	-6,023
<b>Total Allotment Diversions Charges</b>			<b>34,411</b>	<b>223,493</b>	<b>257,904</b>
Diversion Allocation				382,486	390,105
Est. Annual Conservation Credit Diversion Allocation					18,742
Accrued Conservation Credit Diversion Allocation					12,390
<b>Total Diversion Allocation</b>				<b>382,486</b>	<b>402,495</b>
<b>District Allotment Balance</b>				<b>158,993</b>	<b>144,591</b>
2006 Carryover Balance					36,200

# ELEPHANT BUTTE IRRIGATION DISTRICT

## WATER ALLOTMENT CHARGES

SUBJECT TO REVISION

	GROSS DIVERSIONS (AC-FT)		DIVERTED TO TEXAS (AC-FT)		NET DIVERSIONS (AC-FT)	
		TO DATE		TO DATE		TO DATE
ARREY CANAL	9775	63725			9775	63725
PERCHA LATERAL	93	508			93	508
LEASBURG CANAL	8739	67663			8739	67663
CALIFORNIA EXTENTION	0	353			0	353
EASTSIDE CANAL	7295	48677	311	1920	6984	46757
DEL RIO LATERAL	476	2989			476	2989
WESTSIDE CANAL	18793	135991	5267	41097	13526	94894
PUMPED FROM RIVER**	0	56			0	56
<b>GROSS TOTAL</b>	<b>45171</b>	<b>319962</b>	<b>5578</b>	<b>43017</b>	<b>39593</b>	<b>276945</b>

	NET DIVERSION TO DATE	
TOTAL CHARGES (AC-FT)	39593	276945
CREDIT AT ARREY (-)	1216	3882
CREDIT AT LEASBURG (-)	0	233
<b>NET ALLOTMENT CHARGE</b>	<b>38,377</b>	<b>272,830</b>
DISTRICT ALLOTMENT		311,517
DISTRICT BALANCE		38,687

\*\* GREENWOOD AND DURAN RIVER PUMPS (EBID DATA)

## **APPENDIX B – Required Flow Metering Stations**

In order to assure accurate metering of allocated water deliveries to EBID, EPCWID and Mexico, the following metering stations will be maintained by the described agencies. The letter prefix before each metering station indicates the valley in which the metering station is located (R for Rincon, M for Mesilla, and E for El Paso).

### **The following continuous stage recorders shall be maintained by the United States:**

R1 – Rio Grande Below Caballo – located on the east side of the river and approximately 0.8 mile downstream of Caballo Dam.

M2 - Rio Grande at Leasburg Canal -- located approximately 1.5 miles downstream of Leasburg Diversion Dam on the river channel just downstream of Leasburg Wasteway No. 1.

Miscellaneous Sites: Any location, not identified herein, at which water from Rio Grande downstream of Elephant Butte Dam and upstream of the Ft. Quitman, Texas, is diverted by the United States, including without limitation, diversions for the Bonita Lateral.

### **The following continuous stage recorders shall be maintained by EBID:**

R2 – Arrey Canal -- The metering bridge is located just downstream of the canal heading and the CMP shelter and recorder are located just downstream of the Percha State Park bridge crossing.

R3 – Percha Lateral – The lateral water flow is measured just downstream of the lateral heading and the CMP shelter with recorder are located downstream of the metering RC Box culvert.

R4 – Wasteway No. 5 at Hatch Siphon -- This wasteway is located upstream of the Hatch Siphon at the Rio Grande.

R5 – Garfield Drain -- located north of the US Hwy 85 bridge, 3 miles north of Hatch, New Mexico, and west of the highway on the drain channel.

R6 – Rio Grande at Hatch – located approximately 3 miles north Hatch, New Mexico, and west of the US Hwy 85 bridge on the right side of the river channel.

R7 – Wasteway No. 16 at Rincon Siphon – located downstream on the river channel from the A.T. & S. F. Railroad crossing the Rio Grande approximately 2 miles east of Hatch, New Mexico.

R8 – Hatch Drain – located on the drain upstream of UW Hwy 85 approximately 2.5 miles east of Hatch, New Mexico.

R9 – Wasteway No. 18 from Rincon Lateral – located approximately 8 miles east of Hatch, New Mexico, north of the US Hwy 85, and on the left side of the Rio Grande.

R10 – Rio Grand at Hayner Bridge – located approximately 8 miles east of Hatch, New Mexico on the Rio Grande just upstream of the Tonuco River crossing.

R11 – Rincon Drain – located approximately 8 miles east of Hatch, New Mexico, 1 mile north of the Tonuco River crossing, and downstream of the intersection of the Rincon Lateral and Rincon Drain.

M1 – Leasburg Canal – located approximately 1.5 miles from the canal heading and approximately 0.5 miles east from the intersection of Fort Selden Road (from US I-25) and US Hwy 85.

M3 – Selden Drain – located approximately 3.5 miles south of Radium Springs, New Mexico and just east of U.S. Hwy 85, immediately upstream of the intersection of Kerr Lateral with the drain.

M4 – Wasteway No. 5 – located approximately 5 miles north of Las Cruces, New Mexico and one mile south of the intersection of NM Hwy 430 and US Hwy 85, on the left side of the river channel.

M5 – Wasteway No. 8 – located approximately 3 miles north of Las Cruces, New Mexico on the left side of the river approximately 2 miles west of US Hwy 85.

M6 – Picacho Drain – located approximately 2.0 miles northwest from Mesilla Diversion Dam, west of the Rio Grande, and just downstream from the Nusbaum Lateral inflow into the Picacho Drain.

M8 – West Side Canal – located west off the Mesilla Diversion Dam. Station is located approximately 0.5 miles downstream of the canal heading and contains a metering bridge and CMP shelter with recorder.

M9 – East Side Canal – located east off the Mesilla Diversion Dam. The Station is located approximately 0.25 miles downstream of the canal heading and contains a metering bridge and CMP shelter with recorder.

M10 – Del Rio Lateral – located east off the Mesilla Diversion Dam. Station is located approximately 0.5 miles downstream of the lateral heading and contains a metering bridge and CMP shelter with recorder.

M11 – Rio Grande Below Mesilla – located approximately 0.75 miles downstream of Mesilla Diversion Dam on the Rio Grande.

M12 – Wasteway No. 15 – located approximately 200 feet upstream of the left (east) of the river levee and 1.6 miles downstream from the New Mexico State Hwy No. 28 bridge crossing of the Rio Grande.

M13 – Santo Tomas River Drain – located approximately 3.4 miles downstream of the New Mexico State Hwy No. 28 bridge crossing and 0.8 miles upstream of the Mesquite-San Miguel Road bridge crossing the Rio Grande. The station is on the west side of the river on the Santo Tomas River Drain upstream of the culvert through the levee.

M14 – Wasteway No. 25 – located approximately 3.5 miles downstream of the New Mexico State Hwy No. 28 bridge crossing and 0.7 mile upstream of the Mesquite-San Miguel Road Bridge crossing the Rio Grande. The station is on the west side of the river on the tail end of the Santo Tomas River Lateral on the river side of the lateral embankment.

M15 – Wasteway No. 26 – located approximately 1.5 miles west of Mesquite, New Mexico on the right side of the river off the Upper Chamberino Lateral and just downstream of the river crossing the Mesquite-San Miguel state road.

M16 – Brazito River Lateral Wasteway – located on the east side and 0.7 mile downstream of the Mesquite-San Miguel Road bridge crossing the Rio Grande. The station is on the tail end of the Brazito River Lateral and is downstream of the river levee.

M17 – Wasteway No. 18 – located approximately 1.5 miles northwest from Vado, New Mexico on the left (east) side of the river. This station is just upstream where the wasteway crosses Del Rio Drain and downstream of the railroad tracks.

M19 – Del Rio Drain -- located approximately 3 miles south of Mesquite, New Mexico and north of Vado, New Mexico. Station is just west off US Hwy 85 and 125 feet downstream of the Vado Mesquite Road Crossing Del Rio Drain.

M20 – Wasteway No. 19 – located between a fork formed by the river on the west and the A.T. & S.F. railroad and approximately 2.0 miles northwesterly from Berino, New Mexico. The wasteway station is approximately 500 feet from the Three Saints Lateral and wastes this lateral into the Rio Grande.

M21 – Wasteway No. 30 – located downstream of the New Mexico State Road 226 from Berino, and downstream of the river levee between the Chamberino East Lateral and the Rio Grande.

M22- La Mesa Drain – located approximately 2.5 miles west of Berino, New Mexico, west of the river, and ½ mile from wasteway No. 31.

M23 – Wasteway No. 31 – located approximately 2.5 miles southwest of Berino, New Mexico, west of the river, and 3 miles downstream from the intersection of the river with State Hwy 226 (Berino to Chamberino).

M24 – Wasteway No. 20 – located on the east side of the Rio Grande and wastes the Three Saints West Lateral. This wasteway is approximately 1.6 miles upstream of the Anthony bridge crossing the Rio Grande.

M25 – Wasteway No. 31B – located approximately 0.5 mile upstream of the Anthony bridge crossing and on the west side of the Rio Grande. This wasteway is on the tail end of the Jimenez Lateral and is upstream of the river levee.

M26 – Wasteway No. 21 – located approximately 0.5 mile upstream and on the east side of the Rio Grande. This wasteway is on the tail end of the Three Saints West Lateral and is 300 feet upstream of the river levee.

M27 – La Union West Canal – located approximately 3 miles west of Anthony, New Mexico just downstream of the canal heading.

Miscellaneous Sites: Any location where diversion of water from the Rio Grande occurs in New Mexico downstream of Caballo Dam and upstream of the upstream of the American Diversion Dam, including but not limited to the California Lateral Extension and various river pumps.

**The following continuous stage recorders shall be maintained by EPCWID:**

M28 – La Union East Canal – located approximately 3 miles west of Anthony, New Mexico just downstream of the canal heading.

M29 – Three Saints East – located approximately 0.3 mile upstream of the intersection of the Three Saints Lateral and FM1905 from Anthony.

M30 – Wasteway No. 32 – located approximately 2 miles west of Anthony, New Mexico, on the right side of the river, and just downstream of New Mexico State Hwy 225.

M32 – East Drain – located approximately 2 miles south of Anthony, New Mexico and west of US Hwy 80A.

M33- Wasteway No. 32A – located 2 miles upstream of the Anthony bridge crossing and on the west side of the Rio Grande. This wasteway is on the tail end of the Rowley Lateral and just upstream of the river levee.

M35 – Wasteway No. 32B – located west and downstream of the Vinton bridge crossing the Rio Grande. Station is on the tail end of the Vinton Cutoff Lateral and just downstream of the river levee.

M36 – Wasteway No. 34 -- located just downstream of the Montoya Siphon and is on the tail end of the Canutillo Lateral.

M37 – Wasteway No. 34A – located approximately 0.6 mile upstream of the Combined La Union Lateral and on the west side of the Rio Grande.

M38 – Wasteway No. 35 – located 3.5 miles downstream from Canutillo, Texas on the right side (west) of the Rio Grande.

M39 – Wasteway No. 35C – located just downstream and on the west side of the Rio Grande. Station is on the tail end of the Schutz Lateral and upstream of the river levee.

M40 – Wasteway No. 36 - located at the tail end of the Montoya Lateral A and on the east side of the Rio Grande.

M41 – Montoya Drain -- located in the Upper Valley, Texas, approximately two miles downstream of Country Club Road on the Montoya Drain.

M42 – Wasteway No. 38 – located just down stream of the Sunland Park Road on the Montoya Main Lateral.

M45 – Rio Grande at Canutillo – located approximately 1.0 mile north of Canutillo, Texas and on the right and west side of the Rio Grande.

E1 – American Canal – located off Paisano Drive on canal concrete lined channel just downstream of the Paisano Siphon and ASARCO plant.

E2 – Robertson/Umbenhauer Water Treatment Plant – located adjacent to the American Canal Extension near Canal Street in downtown El Paso.

E3 – Franklin Canal – located downstream of heading of the Franklin Canal near the 2<sup>nd</sup> Street Check on the American Canal Extension.

E4 – Jonathan Rogers Water Treatment Plant - located adjacent to the Riverside Canal immediately upstream of the E5 metering station

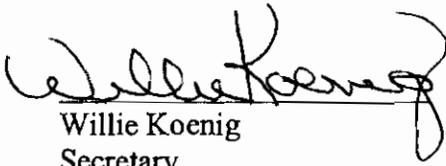
- E5 – Riverside Canal – located on the right side (south) and approximately 800 feet downstream of the canal heading.
- E6 – Riverside Canal Wasteway No. 1 – located on the right side of the canal just south of the Bosque Park. Wasteway is from Riverside Canal to the Rio Grande.
- E7 – Riverside Canal Wasteway No. 2 – located downstream from Riverside Canal Wasteway No. 1, at a point where the canal channel departs from the river levee, approximately 2.5 miles northwest of Cuadrilla, Texas.
- E8 – Fabens Waste Drain – located on the Waste Drain Channel just west of U.S. Hwy 20 at Fabens, Texas.
- E9 – Fabens Waste Channel – located southeast of Fabens, Texas, downstream on the waste channel from the Tornillo Canal Heading and the Cook-Schultz Lateral inlet intersection.
- E10 – Waste Channel Below Tornillo Wasteway No. 1 – located on the Fabens Waste Channel below the Tornillo Canal Wasteway and the Tornillo-Caseta Road.
- E12 – Hudspeth Feeder Canal – located on the Hudspeth Feeder Canal approximately six miles downstream from the Guadalupe-Caseta Road and International Bridge in to Caseta, Mexico.
- E13 – Tornillo Canal Wasteway No. 2 – located approximately 1 mile east of Alamo Alto, Texas on the canal channel adjacent to U.S. Hwy 20 Alternate.
- E14 – Tornillo Drain – located on drain channel just downstream and 800 feet from the Alamo Alto Drain inlet, approximately 0.5 miles southeast of Alamo Alto, Texas.
- Miscellaneous Sites: Any location where diversion of water from the Rio Grande occurs in Texas downstream of Mesilla Dam and upstream of the former location of Riverside Diversion Dam.

IN WITNESS WHEREOF, the Parties have executed this Agreement as of the

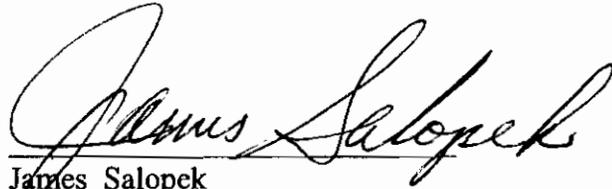
10<sup>th</sup> day of March, 2008.

Attest:

ELEPHANT BUTTE IRRIGATION DISTRICT

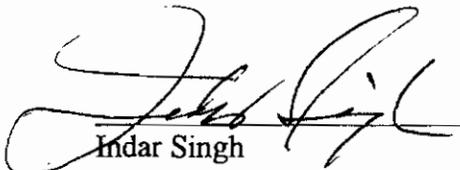
  
Willie Koenig  
Secretary

By:

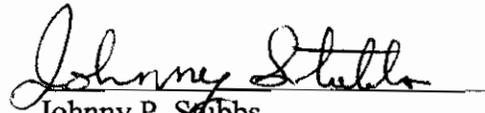
  
James Salopek  
President

Attest:

EL PASO COUNTY WATER IMPROVEMENT  
DISTRICT NO. 1

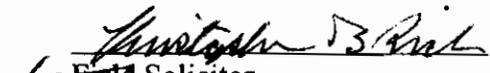
  
Indar Singh  
Secretary

By:

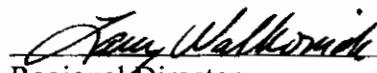
  
Johnny P. Stubbs  
President of the Board of Directors

Attest:

UNITED STATES OF AMERICA

  
Truston B. Price  
for Field Solicitor  
Regional

By:

  
Jay Walkovich  
Regional Director  
Upper Colorado Region  
Bureau of Reclamation

RIO GRANDE PROJECT - OPERATIONS MANUAL

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### **Appendices**

- A- Rio Grande Project Operating Agreement
- B- Example of Allocation Charges for EPCWID
- C- Example of Allocation Charges for EBID
- D- Flow Regulation Calibration at Caballo Dam

### **Exhibits**

- 1- CD-ROM of Ordering and Allocation Spreadsheets

## 1 Disclaimer

This Rio Grande Project Water Accounting and Operations Manual (Operations Manual) contains detailed information regarding the methods, equations and procedures used by the United States Bureau of Reclamation (Reclamation), El Paso County Water Improvement District No. 1 (EPCWID), and Elephant Butte Irrigation District (EBID) to operate the Rio Grande Project and account for all water charges under the Rio Grande Project Operating Agreement. This Operations Manual is an addendum to the Rio Grande Project Operating Agreement and is intended to be consistent with the Project Storage, release and delivery and allocation provisions in the Rio Grande Project Operating Agreement; nothing in the Operations Manual modifies or changes the language and requirements set forth in the Operating Agreement. To the extent any provisions in this Operations Manual are inconsistent or incompatible with the Operating Agreement, such inconsistencies are superseded by the Operating Agreement and/or are null and void.

## 2 Definitions

**Allocated Water:** that portion of the project water supply, as defined in the Operating Agreement, which is determined to be available for diversion and use by EBID, EPCWID and the United States for delivery to Mexico during the primary irrigation season. Accounting of allocated water is subject to the time that it takes water to travel from Caballo Dam to each district's respective diversion points.

**Primary Irrigation Season:** the primary irrigation season is defined as that period of a year when water is being released from Caballo Reservoir for irrigation purposes.

**Allocation Charge:** the debit applied to EBID's, EPCWID's or Mexico's respective amount of allocated Allocation Water.

**Non-Allocated Water:** water in the Rio Grande, during non-irrigation season and after the closing of the Caballo Dam release gates and prior to opening of the Caballo Dam release gates for the subsequent primary irrigation season, which originates from drain flows and other sources which may be diverted by the irrigation districts for application to irrigable land area within their boundaries. All diversions made by the Districts during the non-irrigation season utilizing return flow waters shall not be charged against the District's respective allocations.

**Operating Agreement:** Agreement executed on March 10, 2008 between the United States, EBID and EPCWID.

### **3 Allocation of Project Water**

#### **3.1 EBID and EPCWID**

The U.S. Bureau of Reclamation (Reclamation) shall, prior to the 2nd Tuesday of each month of, allocate Rio Grande Project water in accordance to the Operating Agreement to EBID, EPCWID, and the United States for delivery to Mexico. The final allocation for the year shall include storage and allocation accounting data through the month of October of such year.

#### **3.2 Bonita Private Irrigation Canal**

The Reclamation shall each month inform EBID, EPCWID, and US-IBWC of the amount of water diverted from Caballo Reservoir into the Bonita Private Irrigation Canal by the United States for use in New Mexico.

#### **3.3 United States for Delivery to the Republic of Mexico**

Reclamation shall advise US-IBWC based on the storage conditions at the end of November whether the project waters available for release from Project Storage for the following year are sufficient for a full allocation or whether a proportionally reduced allocation will be made. The initial allocation letter provided by the U.S. Bureau of Reclamation to the US-IBWC is received mid-December of each year, with projected storage conditions in Elephant Butte and Caballo reservoirs through the end of the year.

During drought years when proportionally reduced allotments are made, regular monthly meetings are held at the US-IBWC headquarters. Monthly updates based on the end of previous month reservoir storage conditions and allocation projections for the remainder of the year are presented by Reclamation to the US-IBWC, CILA, EBID, EPCWID and CONAGUA, Juarez irrigation district.

#### **3.4 Diversion of Flood Water in Excess of Project Water Orders**

Reclamation may declare that flood flows, in a specific amount and duration, entering the Rio Grande downstream of Caballo Dam and in amount in excess of Project Water Orders to be Non-Allocated Water and available for diversion by EBID and EPCWID.

### **4 Water Delivery and Accounting**

#### **4.1 Ordering of Water by the Districts**

Figure 1 below shows the order forms to be completed by EPCWID and EBID for review by Reclamation. The amount of flow ordered for delivery to Mexico shall be specified by US-

IBWC. The data fields in Figure 1 shall be entered by EBID and EPCWID each order day during the primary irrigation season by 10:00 am. Based on the information entered into to Figure 1 and the “Flow Regulation Calibration at Caballo Dam” report contained in Appendix D, Prior to 11:00 am each order day, the low level gates at Caballo Dam shall be set to the opening values calculated in Figure 1. The official record of releases of Project Water from Caballo Reservoir shall be calculated by Reclamation and shall be based on the flows recorded by the metering station immediately downstream of Caballo Dam and operated by Reclamation. The amount of opening of the low-level gates shall not be changed if the difference in the amount of the gate opening is  $\pm 0.02$  feet from the prior gate setting. Reclamation will perform a flow measurement at the river station below Caballo Dam whenever there is a change in the release from Caballo Dam of  $\pm 100$  cfs.

Figure 1 - Internet-Based Order Forms

**RIO GRANDE PROJECT ORDER**

Ord:1124	Effective Date: 7/8/2008		Prior:1123	Effective Date: 7/7/2008	
BOR	Date/Time Received: 07/08/08 15:36	Received By: IO	BOR	Date/Time Received: 07/07/08 15:09	Received By: IO
EPCWID #1	Date/Time Entered: 07/08/08 08:39	Approved By: RR	EPCWID #1	Date/Time Entered: 07/07/08 09:49	Approved By: RR
EBID	Date/Time Entered: 07/08/08 08:49	Approved By: MJN	EBID	Date/Time Entered: 07/07/08 09:51	Approved By: MJN

Upper Valley			
From: 7/8/2008 To: 7/9/2008			
Location	Current	Prior	Change
Arrey Canal	140	140	0
(-) Bypass	0	0	0
River Pumps	0	0	0
Leasburg Canal	170	230	-60
(-) Bypass	0	0	0
California Ext.	0	0	0
Del Rio Lateral	0	0	0
Eastside Canal	110	140	-30
Westside Canal	380	400	-20
(-) Bypass WW32	-30	-70	40
<b>Total Upper Valley</b>	<b>770</b>	<b>840</b>	<b>-70</b>
State Line			
From: 7/8/2008 To: 7/9/2008			
Location	Current	Prior	Change
La Union West TX	20	30	-10
La Union West NM	20	30	-10
Gate Settings	Current	Prior	Change
East Gate Recommended	3.98	4.41	-0.43
West Gate Recommended	3.98	4.41	-0.43
EBID Comments			
-			

SUMMARY			
	Current	Prior	Change
<b>RIVER BOOST</b>	<b>50</b>	<b>0</b>	<b>50</b>
River Reaches/Stations	Current	Prior	Change
<b>Caballo Release</b>	<b>1683</b>	<b>1873</b>	<b>-190</b>
Flow below Percha Dam	1543	1733	-190
Gain/Loss (+/-) above Leasburg	50	0	50
Flow at Leasburg Cable	1423	1503	-80
<b>Gain/Loss (+/-) Leasburg/Mesilla</b>	<b>0</b>	<b>0</b>	<b>0</b>
Flow below Mesilla Dam	933	963	-30
Gain/Loss (+/-) Mesilla-American	0	0	0
Flow at American Dam	963	1033	-70
District Totals	Current	Prior	Change
<b>Total for EBID</b>	<b>690</b>	<b>780</b>	<b>-90</b>
<b>Total for EPCWID #1</b>	<b>866</b>	<b>916</b>	<b>-50</b>
<b>Total for Both Districts</b>	<b>1556</b>	<b>1696</b>	<b>-140</b>
Project Totals	Current	Prior	Change
<b>Total Gains/Loss</b>	<b>50</b>	<b>0</b>	<b>50</b>
Total EBID, EPCWID, Mexico	1733	1873	-140
<b>Release</b>	<b>1683</b>	<b>1873</b>	<b>-190</b>

State Line			
From: 7/10/2008 To: 7/12/2008			
Location	Current	Prior	Change
La Union East TX	60	30	30
La Union East NM	30	20	10
3 Saints East TX	0	0	0
3 Saints East NM	0	0	0
<b>Total State Line</b>	<b>130</b>	<b>110</b>	<b>20</b>
Lower Valley			
From: 7/11/2008 To: 7/13/2008			
Location	Current	Prior	Change
UR-WTP	56	56	0
Franklin Canal	160	130	30
JR-WTP	85	85	0
Riverside Canal	485	585	-100
<b>Total Lower Valley</b>	<b>786</b>	<b>856</b>	<b>-70</b>
Comments - EPCWID			
-			
Mexico			
From: 7/11/2008 To: 7/13/2008			
Location	Current	Prior	Change
Mexico	177	177	0
<b>Total Mexico</b>	<b>177</b>	<b>177</b>	<b>0</b>
Comments - Mexico			
-			

Reclamation			
			Order # 1124
	Current	Prior	Change
Caballo Elevation			
USBR Elevation (ft)	4148.58	4148.44	0.14
Recommended River Boost (cfs)	0.00	0.00	0
Accretions (cfs)	50.00	0.00	50
Gate Settings	Current	Prior	Change
<b>East Gate (ft)</b>	<b>3.98</b>	<b>4.41</b>	<b>-0.43</b>
<b>West Gate (ft)</b>	<b>3.98</b>	<b>4.41</b>	<b>-0.43</b>
Recommended Flow Setting	Current	Prior	Change
<b>CFS</b>	<b>1683</b>	<b>1873</b>	<b>-190</b>
Scheduled Time of Change	10:00		
USBR River Measurement	Date	Time	Flow
<b>Measured Flow (cfs)</b>	<b>7/8/2008</b>	<b>13:15</b>	<b>1756</b>
USBOR Confirmation of Mexico Order	Yes		
Comments			
BOR recom. gate settings @ 3.86 ea.=1683 Dist. recom. gate settings @ 3.98 ea.=1735			
Date/Time Received: 07/08/08 15:36	Received By: IO		

## 4.2 Estimate of the Time Required for Water Released from Caballo Reservoir to Travel in the Rio Grande to Diversion Dams

Project Water is released from Caballo Reservoir is diverted at the Percha, Leasburg, Mesilla, and American diversion dams located downstream of Caballo Dam on the Rio Grande. The time required for water released from Caballo Reservoir to travel to each of these dams varies with the amount of water in the Rio Grande, the amount of water released, the amount of change in the amount of water released (both magnitude and sign), the amount of water being diverted at each diversion point, and other considerations. As water released from Caballo travels from Caballo Dam towards American Dam in the Rio Grande it does such as a wave that is attenuated and modified with distance. For example, if the amount of flow released from Caballo Dam is changes from 1,000 cfs to 1,500 cfs, the 500 cfs increase occurs almost instantly, but assuming no water is lost or gained between Caballo Dam and American Dam, the arrival of the change-in-release would be gradual. Figure 2 below show the measured hydrographs during the initial release of water from Caballo Dam in 2007 at various locations on the Rio Grande downstream of Caballo Dam. Because the change-in-release is modified as it flows downstream, the estimated travel times are based on the time that 90% of the anticipated change arrives at the given diversion dam. For the above example of a 500 cfs change at Caballo with no loss or gain of water, the travel time would be that when 450 cfs of the change arrived at given location. Table 1 below lists the distance and average travel time for the Rio Grande Project diversion dams on the Rio Grande.

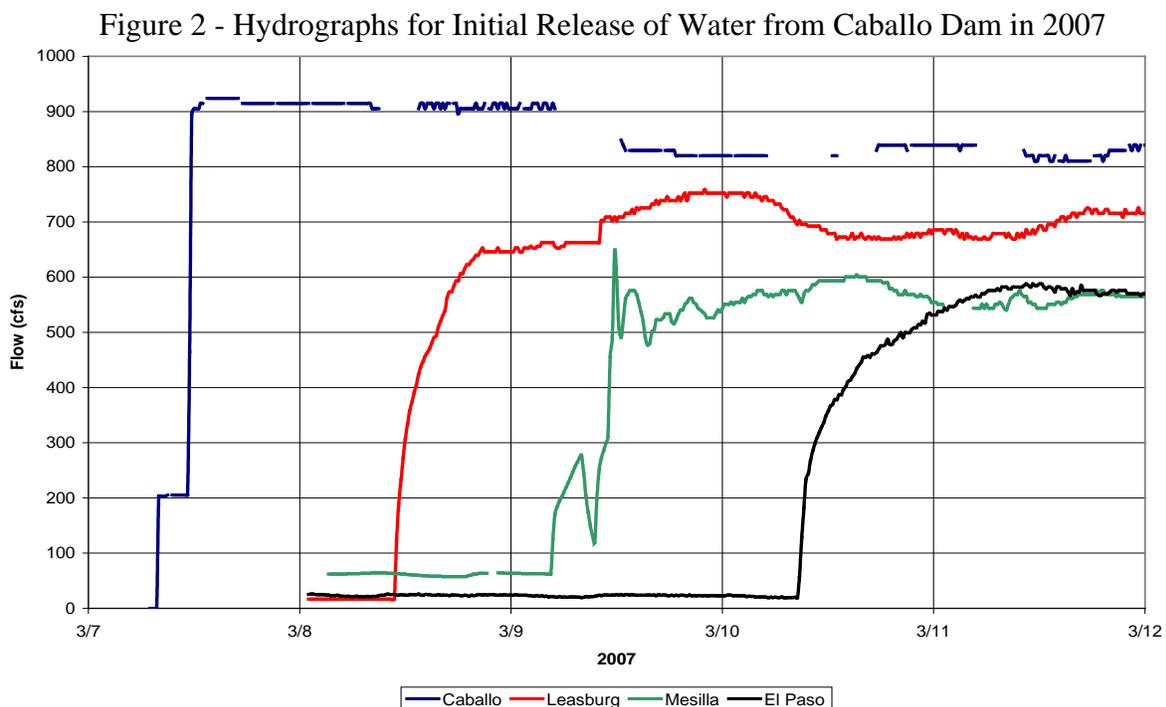


Table 1 - Average Travel from Caballo Dam to Various Diversion Dams

River Location / Reach	River Miles from Caballo Dam	River Reach Miles	Travel Velocity	Cumulative Travel Time in Hours	Travel Time per River Reach in Hours	Example Day of Week	Example Hour of Day
Rio Grande at Caballo Dam	0	-		0	0	Monday	11:00 AM
Percha Diversion Dam	1.2	1.2	0.6	2	2	Monday	1:00 PM
Leasburg Diversion Dam	44.8	43.6	2.4	20	18	Tuesday	7:00 AM
Mesilla Diversion Dam	67.5	22.7	2.3	30	10	Tuesday	5:00 PM
American Diversion Dam	106.8	39.3	1.1	66	36	Thursday	5:00 AM
International Diversion Dam	108.9	2.1	1.1	68	2	Thursday	7:00 AM

### 4.3 Sharing of Storages

Flows at American Canal Heading occasionally drop below the order of the EPCWID. At times when the actual flow at EPCWID delivery points is 100 CFS or more below the EPCWID's order, and at EPCWID option, the following method of sharing the shortage between EBID and EPCWID shall be implemented:

EBID shall release additional water through wasteways equal to one half of the amount of shortage at Riverside Canal Heading. EBID and EPCWID shall adjust the order for release from Caballo Reservoir to correct for such shortage. EBID shall receive credit against their allocation charge for the amount of additional water released through their wasteways because of such shortage.

### 4.4 Water Flow Measurement Stations

Each party shall maintain and operate the water flow measurement (metering) stations as listed in the Operating Agreement. Each station used in accounting of delivery of allocated water and listed in sections 4.5.2 and 4.5.3 shall be equipped with a Steven's Type F recorder and the water levels shall be continuously recorded on paper charts. A digital copy of the charts shall be made available by the party maintaining the metering station upon request by any other party.

### 4.5 Measurement of Flow and Volume

Water flow and volume measurement shall generally following procedures as outlined in USGS Water Supply Paper 2175. Rating tables for metering stations shall be determined at least annually by the party maintaining the station using previous flow measurements.

#### 4.5.1 United States Section of the International Boundary and Water Commission (US-IBWC)

The US-IBWC measures twice a week at the Below American Dam gaging station and twice weekly at the headworks of the Acequia Madre, preferably on Mondays and Fridays each week

during the primary irrigation season. CILA measures the amount of water flowing in Acequia Madre at its headworks three times a week, usually on Mondays, Wednesdays and Fridays. All information regarding measurements are exchanged between the two sections. Based upon the latest US measurements, the US-IBWC determines the appropriate gage height setting at the metering station immediately downstream of American Dam on the Rio Grande and the corresponding gate setting at American Dam to deliver the requested flow rate into the Acequia Madre.

The water delivered to Mexico in the Rio Grande at the headworks of the Acequia Madre pursuant to the 1906 Convention is computed by subtracting 1) computed losses in the reach between Below American Dam gauging station and the Acequia Madre headworks and 2) estimated leakage through International Dam from the computed flows at the Below American Dam gauging station.

#### 4.5.2 EBID

Figure 3 - Example of EBID's Monthly Water Allotment Charges Report

ELEPHANT BUTTE IRRIGATION DISTRICT WATER ALLOTMENT CHARGES (acre-feet) for Month of April 2008 SUBJECT TO REVISION						
	Gross Diversions		Diverted to Texas		Net Diversion	
	Month	Year to Date	Month	Year to Date	Month	Year to Date
ARREY CANAL	12,091	22,237			12,091	22,237
PERCHA LATERAL	67	71			67	71
LEASBURG CANAL	11,439	18,710			11,439	18,710
CALIFORNIA EXTENTION	0	0			0	0
EASTSIDE CANAL	7,771	11,954	-353	-514	7,418	11,441
DEL RIO LATERAL	466	823			466	823
WESTSIDE CANAL	20,594	38,029	-6,248	-13,019	14,347	25,010
PUMPED FROM RIVER**	0	0			0	0
<b>GROSS TOTAL</b>	<b>52,429</b>	<b>91,824</b>	<b>6,601</b>	<b>13,533</b>	<b>45,828</b>	<b>78,292</b>
TOTAL CHARGES					45,828	78,292
CREDIT AT ARREY (-)					-692	-763
CREDIT AT LEASBURG (-)					-87	-87
NET ALLOTMENT CHARGE					45,049	77,442
DISTRICT ALLOTMENT						198,384
DISTRICT BALANCE						120,942
** GREENWOOD AND DURAN RIVER PUMPS (EBID DATA)						

Charges to EBID are made using the following diversion points:

- a) Arrey Canal,
- b) Percha Lateral,
- c) Irrigations from Leasburg Canal above gauging station,
- d) Leasburg Canal,

- e) California Lateral,
- f) West Side Canal (NM portion),
- g) East Side Canal (NM portion),
- h) Del Rio Lateral, and
- i) the Greenwood, Duran, Roundtree, Dulin, Dorser, and Thurston pumps located in the Rincon Valley.

#### 4.5.3 EPCWID

Figure 4 - Example of EPCWID's Monthly Water Allotment Charges Report

<b>EPCWID Diversion Allocation Charges for Mar 2008</b>					
Diversion Location	Metered Volume	Adjustment for Conveyance Losses for NM Deliveries	Diversion Allocation Charges for Month	Beginning-of-Month Totals	End-of-Month Totals
	ac-ft	ac-ft	ac-ft	ac-ft	ac-ft
L U E Canal - TX	3,092	95%	2,937	0	2,937
L U W Canal - TX	1,096	95%	1,041	0	1,041
Three Saints Lateral	133	100%	133	0	133
<b>Total Mesilla Valley (Texas)</b>			<b>4,112</b>	<b>0</b>	<b>4,112</b>
Umbenhauer/Robertson Water Treatment Plant	1,820	100%	1,820	61	1,881
Franklin Canal	6,246	100%	6,246	256	6,502
United States - Ysleta del Sur Agreement	0	100%	0	0	0
United States Section - IBWC (Construction Water)	0	100%	0	0	0
Jonathan W. Rogers Water Treatment Plant	2,539	100%	2,539	0	2,539
Riverside Canal	21,751	100%	21,751	1,680	23,431
Haskell R. Street WWTP Effluent	-1,461	100%	-1,461	-239	-1,700
Credit for Diversions greater than Orders (El Paso Valley)	-200	100%	-200	0	-200
<b>Total Allotment Diversions Charges</b>			<b>34,806</b>	<b>3,132</b>	<b>36,565</b>
Diversion Allocation				232,339	257,951
Est. Annual Conservation Credit Diversion Allocation					16,207
Accrued Conservation Credit Diversion Allocation					2,297
Total Diversion Allocation				232,339	260,248
<b>District Allotment Balance</b>				<b>229,207</b>	<b>223,684</b>

Charges to EPCWID are made using the following diversion points:

- a) East Side Canal (Texas portion)
- b) La Union East Canal (Texas portion)
- c) La Union West Canal (Texas portion)
- d) Franklin Canal
- e) City of El Paso Water Treatment Plants
- f) American Canal Extension for the United States (Ysleta del Sur and US-IBWC)
- g) Riverside Canal

#### **4.6 Water Order by Only One District**

##### **4.6.1**

At the start of the Primary Irrigation Season and when one District orders water for diversion prior to the other, allocation charges to that District shall start on the date and time that water arrives to the delivery point and shall equal the greater of the amount of water ordered for delivery or the amount of water released from Caballo Dam. Any charges based on the amount of water released from Caballo Dam shall be discontinued upon the other district or Mexico ordering water for delivery.

##### **4.6.2**

During years with less than a full allocation and diversion have been discontinued for only one district because of insufficient diversion allocation balance and during the time prior to the termination of release of water from Caballo Dam at the end of the Primary Irrigation Season (when only one District orders water for diversion), the allocation charges shall equal the greater of the amount of diversion charges made in accordance with Appendices A, B, and C of this manual or the amount of water released from Caballo Dam.

#### **4.7 End of Primary Irrigation Season**

Except when Section 4.6.2 is in effect and after the gates at Caballo Dam have been closed, allocated water will be charged to the Districts until such time as the stored water is no longer available at their respective headings or the estimated travel times listed in Section 4.2 above have elapsed, whichever is less. If Section 4.6.2 is in effect, allocation charges for either district shall end at the date and time the gates at Caballo Dam are closed..

#### **4.8 Emergency Conditions**

Each Party shall be allowed to make changes to the water order in response to emergencies such as ditch breaks, flood flows, excessive arroyo inflows, or other accidents to the system.

Reclamation shall make the change in the release from Caballo Reservoir as soon as possible.

The order change for accounting purposes, at the respective diversion point, shall take effect as per the travel times in Section 4.2.

In the event of a total closing of the release gates from Caballo due to an emergency, accounting of delivered allocated water shall be in accordance with Section 6.5 Emergency Conditions (Force Majeure) of the Operating Agreement. Documentation of the changes in orders shall be completed utilizing the process in Section 4.1 as soon as possible and verified by each party.

#### **4.9 Accounting Mistakes Regarding Mexico's Allocation**

During an extraordinary drought or serious accident to the irrigation system in the United States, Mexico's delivery allocation (that has been diminished in the same proportion as the water delivered to lands in the irrigation districts in the United States) shall not be decreased during the calendar year except in the situation where an accounting or measurement mistake has been made resulting in an allocation to Mexico in an amount greater than would have been made if such error had not been made.

In November of each year, if under any situation Mexico's allocation is greater than the same proportion as the water delivered to lands in the irrigation districts in the United States, then the difference in the amount greater than the proportion as the water delivered to lands in the irrigation districts in the United States shall be charged against the delivery allocation of the irrigation districts in amounts proportional to their respective irrigable acres.

#### **4.10 Correction of D2- Linear Regression Equation During Multi-Year Extreme Drought**

The D2 Linear Regression Equation fails to accurately predict the measured amount of water that was diverted from the Rio Grande during consecutive calendar years when the total amount of water released from Caballo Reservoir is less than 400,000 acre-feet. For example during the years 1954 through 1957 the amount of water released from Caballo Reservoir was less than 400,000 acre-feet, and the amount of measured diversions was 88%, 78%, and 75% of the amount predicted by the D2 Linear Regression Equation for the years 1955, 1956, and 1957, respectively. During the 2<sup>nd</sup> consecutive year when the amount of water released from Caballo Reservoir is less than 400,000 acres feet the "Corrected D2 Linear Regression Equation" shall equal the value predicted by the D2 Linear Regression Equation multiplied by 0.88.

During the 3<sup>rd</sup> consecutive year when the amount of water released from Caballo Reservoir is less than 400,000 acres feet the “Corrected D2 Linear Regression Equation” shall equal the value predicted by the D2 Linear Regression Equation multiplied by 0.78.

During the 4<sup>th</sup> and all following consecutive years when the amount of water released from Caballo Reservoir is less than 400,000 acre feet the “Corrected D2 Linear Regression Equation” shall equal the value predicted by the D2 Linear Regression Equation multiplied by 0.75.

If the measured diversion ratio for a consecutive drought year in which the correction to the D2 Linear Regression Equation is applied, is higher than the diversion ratio predicted by the Corrected D2 Linear Regression Equation defined in this section, the measured diversion ratio shall be used for allocation purposes.

## **5 Exchange of Information**

### **5.1 Allocation Water Charges**

Reclamation will provide the EBID and the EPCWID written notification of allocation water charges by the 10th of each following month.

### **5.2 Communications**

Reclamation will provide timely information on any unusual circumstances which could affect the water deliveries to the Districts or Mexico. EBID and EPCWID will immediately notify Reclamation concerning ditch breaks, unusual operating conditions, climatic conditions, or other major disruptions to orderly irrigation operations.

Reclamation will provide river status information daily to the Districts. Additional information or assistance may be requested at any time during Reclamation’s operation hours. Any requests for information or assistance during non-operating hours should be limited to emergencies and not routine items. Reclamation’s project water operations office and field operating hours during the irrigation season will be as follows:

	Office	Field
Weekdays	6:00 am to 4:30 pm	NM: 6:00 am to 6:00 pm TX: 6:00 am to 2:30 pm
Weekends	(none)	NM: 6:00 am to 2:30 pm TX: 6:00 am to 2:30 pm

A current roster of contact numbers for EBID, EPCWID, US-IBWC and Reclamation shall be distributed by each of the above entities to EBID, EPCWID, US-IBWC, and Reclamation. The roster shall be updated as necessary.

### **5.3 Information Provided to Reclamation**

EBID and EPCWID shall provide to Reclamation and the other district the following:

- a) Water orders by 10:00 am on order days
- b) Average flow data (cfs) for all metering station listed in the Operating Agreement by the 2nd Monday of each month following the month in which the data was measured.
- c) Crop report information by January 15, each year.
- d) Water charges to the farms by January 15, each year.

Reclamation shall obtain the following from US-IBWC:

- a) Water orders by 10:00 am on order days.
- b) Preliminary average flow data (cfs) for the Acequia Madre listed in the Operating Agreement by the 2nd Monday of each month following the month in which the data was measured.
- c) Final average flow data (cfs) by the last day of each month following the month in which the data was measured.

### **5.4 Information Provided by Reclamation**

Reclamation shall provide to EBID, EPCWID, and US-IBWC the following information by the 2nd Tuesday of each month.

- a. Amount of water stored in Elephant Butte and Caballo Reservoirs
- b. Amount of non-project water storage
- c. Amounts of project water stored above Elephant Butte in the Upper Rio Grande Basin
- d. Cumulative annual amount of water released from Elephant Butte and Caballo Reservoir
- e. Current inflow to Elephant Butte and Caballo Reservoir

In addition to the above information, Reclamation shall, by January 15 of each year, provide to all parties documentation of compliance, during the previous year, by the City of El Paso with terms of “Exhibit C – Determination of Underflow of the Rio Grande Captured by the City of El

Paso’s Groundwater Withdrawal” of the contract among the City of El Paso, EPCWID, the United States numbered 01-WC-40-6760 (2001 Implementing Contract).

## **6 Updating of Operations Manual**

EBID, EPCWID, and Reclamation (including representation from US-IBWC under the auspice of Reclamation) will meet once a year in January, or more frequently if requested by one of the three parties, to review this operating manual. The Parties may modify any provisions of this manual upon having reached unanimous consent. No unilateral departure from this manual is allowed. Proposals for updates shall be submitted to all parties by January 1st of each year for review during the January meeting. The proposal shall consist of a detailed description of the proposed update with a justification for the update. Adoption of the update shall be by unanimous consent for the start of the irrigation season agreed to by the parties. At any time during the year any party may submit proposal for updating this manual. The proposal shall consist of a detailed description of the proposed update with a justification for the update.

Adoption of the update shall be by unanimous consent on the date agreed to by the parties. Consent of adoption of the update shall communicated by letter to each party. The Bureau of Reclamation shall make the updated manual available to the general public upon implementation. No unilateral departure from this manual is allowed.

## **7 Record of Changes Made to This Operating Manual**

August 13, 2008	Original Manual
January 15, 2009	No changes made.
January 12, 2010	Deletions, additions, revisions, and changes made to sections 3.1, 3.3, 4.1,4.5.1, 4.6,1, 4.6.2, 4.7, 4.9, 5.2, 5.3, and 6. as shown in the redline version dated January 12, 2010. No changes made to appendices.
May 8, 2012	Addition of Section 4.10. No changes made to appendices.

**APPENDIX A – RIO GRANDE PROJECT OPERATING AGREEMENT**

## **APPENDIX B – EXAMPLE OF EPCWID’S MONTHLY CHARGES**

The following descriptions are provided for convenience only. The actual equations, procedures, and representations contained in the electronic spreadsheet named EPCWID\_Charges\_2008.xls and attached to this document as Exhibit 1 shall be used for determining EPCWID charges.

### **Description of Calculations used to determine EPCWID’s Allocation Charges**

Overview: EPCWID monthly allocation charge are calculated using information from Table B-1 –Monthly Summary, Table B-2 – Average Daily CFS Values, and Table B-3 – El Paso Valley Spills. Each of the three tables is specific for each month of the year and a single spreadsheet file (MS-EXCEL) shall be distributed by EPCWID to the other parties each month that contains the tables. Table B-1 is linked to Tables B-2 and B-3 and previous monthly tables to provide the summary of the allocation charges and a running balance of the amount of Project Water available for diversion by EPCWID. Table B-2 contains the daily flow (average cfs) values for each of the flow metering sites that is used in the calculations of charges and the respective amount of water ordered by EPCWID or EPCWID and EBID at La Union East, La Union West, and Three Saints irrigation canals. Table B-3 contains the daily volumes of water flowing out of EPCWID wasteways and spillways in the El Paso Valley. Table B-3 is used to determine the amount of water that is eligible for evaluation in Table B-2 for an allocation credit to EPCWID. The purpose of the allocation credit is to provide an accounting procedure that promotes conservation by allowing EPCWID to attempt to use water that is in excess of EPCWID’s order for Project Water on any given day and is diverted at the American Diversion Dam into the American Canal.

### **Table B-1: EPCWID Diversion Allocation Charges Summary**

**Row 4:** The La Union East irrigation canal supplies water to irrigable lands in both Texas and New Mexico. The metered volume for the La Union East irrigation canal is obtained from Table B-2. The EPCWID allocation charge is 95% of the metered volume. The 5% reduction is in consideration of the transportation losses associated with the water delivered to lands in New Mexico.

**Row 5:** The La Union West irrigation canal supplies water to irrigable lands in both Texas and New Mexico. The metered volume for the La West East irrigation canal is obtained from Table B-2. The EPCWID allocation charge is 95% of the metered volume. The 5% reduction is in consideration of the transportation losses associated with the water delivered to lands in New Mexico.

**Row 6:** The Three Saints irrigation canal downstream of the Texas state line only supplies water to irrigable lands in Texas. The metered volume for the La Union East irrigation canal is obtained from Table B-2.

**Row 7:** EPCWID total allocation charges for the Mesilla Valley equal the sum of charges for rows 4, 5, and 6.

**Row 8:** The Umbenhaur-Robertson WTP diverts water from the American Canal Extension upstream of the Franklin Canal Heading. The amount of water diverted is measured by the City of El Paso and Reported to EPCWID. The gross amount of the measured volume is used as the allocation charge.

**Row 9:** EPCWID diverts water from the American Canal Extension upstream at the Franklin Canal Heading. The amount of water diverted is measured by EPCWID. The gross amount of the measured volume is used as the allocation charge.

**Row 10:** The United States on behalf of the Ysleta del Sur Nation diverts water from the American Canal Extension into the Rio Grande immediately upstream of the former Riverside Diversion Dam. The Ysleta del Sur Nation owns irrigable land within EPCWID that receives and allocation of water from EPCWID.

**Row 11:** During maintenance of the Rio Grande levee system and other work, the US-IBWC uses water pumped from the American Canal Extension.

**Row 12:** The Jonathan Rogers WTP diverts water from the Riverside Canal upstream of the Riverside Canal metering station. The amount of water diverted is measured by the City of El Paso and Reported to EPCWID. The gross amount of the measured volume is used as the allocation charge.

**Row 13:** The American Canal Extension terminates in the Riverside Canal. EPCWID measures the amount of water in the Riverside Canal immediately downstream of the City of El Paso's diversion point for the Jonathan Rogers WTP. The amount of water diverted is measured by EPCWID. The gross amount of the measured volume is used as the allocation charge.

**Row 14:** In accordance with the 2001 Implement Agreement among the United States, EPCWID, and the City of El Paso, EPCWID receives credit for non-project water discharged into the American Canal Extension by the City of El Paso at their Haskell Street WWTP upstream of the Riverside Canal and downstream of the Franklin Canal Heading. The amount of water discharge is measured by the City of El Paso and reported to EPCWID.

**Row 15:** Tables B-2 and B-3 contain measurements and calculations required to determine the volume of credit to be applied to EPCWID allocation charges for water diverted into the Franklin

or Riverside canals that is greater than the amount of water ordered by EPCWID for diversion and is not used by EPCWID. Details of the calculations are provided in the section regarding Tables B-2 and B-3 below.

**Row 16:** The total diversion allocation charges equal the sum of rows 7 through 15.

**Row 17:** Reclamation, in accordance with this manual and the Operating Agreement, provides EPCWID with its total diversion allocation.

**Row 18:** The maximum amount of diversion allocation that is eligible for determining the American Canal Extension Conservation Credit is 376,863 acre-feet per year.

**Row 19:** The estimated annual American Canal Extension Conservation Credit is calculated using the following formula:

$$\begin{aligned} & [(-0.7908 \times 0.8 \times \text{Estimated Annual Diversion} / 376,840)^2 \\ & + (1.6477 \times 0.8 \times \text{Estimated Annual Diversion} / 376,840) + 0.1431] \times 20,052 \end{aligned}$$

**Where the Estimated Annual Diversion equals the Diversion Allocation for Conservation Credit – Estimate of Balance of Allocation at End-of-Year; that is, (Row 18 – Row 23)**

**Row 20:** The accrued annual American Canal Extension Conservation Credit is calculated using the following formula:

$$\begin{aligned} & \text{Total Allotment Diversions Charge} / \text{Diversion Allocation for Conservation Credit} \times \\ & \text{Estimated Annual Conservation Credit Diversion Allocation; that is,} \\ & \text{(Row 16} / \text{Row 18} \times \text{Row 19)} \end{aligned}$$

**Row 21:** The total diversion allocation for EPCWID equals the sum of rows 17 and 20.

**Row 22:** EPCWID's end-of-month allocation balance equals Row 21 minus Row 16.

**Row 23:** At various times during the Primary Irrigation Season, EPCWID estimates the District Allocation Balance at the end-of-year. This estimate is subject to the limitation on the amount of Project Water that can be carried over from one year to the next as set forth in the Operating Agreement.

### **Table B-2: Average Daily CFS and Allocation Charges by Diversion Site**

**La Union East Canal (Texas Portion):** The determination of EPCWID allocation charges for La Union East Canal (LUE) is complex and requires 11 columns of measured or calculated values. The complex calculations are a result of the fact that the LUE canal services land in both Texas and New Mexico. Also, water flows in the LUE canal for bypass to the Rio Grande

through WW32 and downstream diversion into the American Canal, and WW32 is used to discharge excess flow from EBID. In general the allocations charges for LUE are based on the net amount of water measured by EPCWID at the LUE metering station multiplied (prorated) by the ratio of the EPCWID order to the total order for LUE. The net amount of water measured at LUE is equal to the gross amount of water metered at LUE minus the gross amount of water metered at WW32.

**La Union West Canal (Texas Portion):** EPCWID allocation charges for La Union West Canal are equal to the gross amount of water measured by EBID at the LUW metering station multiplied (prorated) by the ratio of EPCWID LUW order to the total order for LUW.

**Three Saints Lateral Canal (Texas Portion):** EPCWID's allocation charges for the Three Saints Lateral (TSL) are equal to net amount of water measured by EBID at the TSL metering station multiplied (prorated) by the ratio of EPCWID TSL order to the total order for TSL. The net amount of water measured at TSL is equal to the gross amount of water metered at TSL minus the gross amount of water metered at WW23A. If there is no order for water at TSL and the gross amount of flow at TSL is less than or equal to 5 cfs, then the gross amount of flow is assumed to be equal to zero.

**Umbenhaur-Robertson WTP:** The values in this column are the daily gross amount of water metered by the City of El Paso as it is diverted from the American Canal Extension for the Umbenhaur-Robertson WTP.

**Franklin Canal:** The values in this column are the daily gross amount of water metered by EPCWID as it is diverted from the American Canal Extension.

**Jonathan Rogers WTP:** The values in this column are the daily gross amount of water metered by the City of El Paso as it is diverted from the Riverside Canal for the Jonathan Rogers WTP.

**Riverside Canal:** The values in this column are the daily gross amount of water metered by EPCWID flowing in the Riverside Canal immediately downstream of the Jonathan Rogers WTP.

**Haskell Street WWTP Water Credit:** The values in this column are the daily gross amount of water metered by the City of El Paso as it is discharged into the American Canal Extension from the Haskell Street WWTP.

**Total El Paso Valley Order:** The values in this column are equal to the sum of the orders and diversion for all of the diversion sites described above.

### **Table B-3: EPCWID El Paso Valley Daily Spills**

**Riverside WW1:** The estimate of the amount of flow discharged from the Riverside Canal through WW1 to the Rio Grande. The estimate is made based on cfs per inch of gate setting and the duration of flow. Normally all gates at WW1 are closed.

**Riverside WW2:** The estimate of the amount of flow discharge from the Riverside Canal through WW2 to the Rio Grande. The estimate is made based on cfs per inch of gate setting and the duration of flow. Normally all gates at WW2 are closed.

**Fabens Waste Drain:** The flow in Fabens Waste Drain has both agricultural drain water (groundwater water) and water discharge through upstream wasteways. The amount of waste water varies from hour to hour while the amount of drain flow is more steady and varies from week to week. The drain flow is estimated by inspection of the flow hydrographs. The Fabens Waste Drain flows into the Fabens Waste Channel.

**Fabens Waste Channel:** The Fabens Waste Channel flow includes both wasteway water and the Fabens Waste Drain drainage water. The net spill water is calculated by subtracting the Fabens Waste Drain agricultural drainage flow from the gross measure flow for the Fabens Waste Channel.

**Tornillo WW2:** Tornillo WW2 is near the El Paso / Hudspeth County Line and at the terminus of the Tornillo Canal. The waste flow is measured by EPCWID.

**Total Spills:** The values in this column equal the sum of the flows at Riverside WW1, Riverside WW2, Fabens Waste Channel, and Tornillo WW2.

**Adjustment for Bustamante and Haskell WWTP:** The sum of the gross amount of water discharged into the American Canal Extension from the Haskell WWTP and the gross amount of water discharged into the Riverside Canal from the Bustamante WWTP.

**EP Valley Spills:** This column equals the Total Spills minus the Adjustment for Bustamante and Haskell WWTP.

**APPENDIX B – EXAMPLE OF EPCWID’S MONTHLY CHARGES (cont.)**

Table B-1: EPCWID Diversion Allocation Charges Summary

Row	EPCWID Diversion Allocation Charges for May 2008					
	Metered Volume	Adjustment for Conveyance Losses for NM Deliveries	Diversion Allocation Charges for Month	Beginning-of-Month Totals	End-of-Month Totals	
2	Diversion Location					
3		ac-ft	ac-ft	ac-ft	ac-ft	
4	L U E Canal - TX	2,542	95%	2,414	5,338	7,752
5	L U W Canal - TX	971	95%	923	2,140	3,063
6	Three Saints Lateral	184	100%	184	308	493
7	Total Mesilla Valley (Texas)			3,521	7,786	11,308
8	Umbenhauer/Robertson Water Treatment Plant	3,592	100%	3,592	5,114	8,707
9	Franklin Canal	6,415	100%	6,415	12,738	19,153
10	United States - Ysleta del Sur Agreement	0	100%	0	0	0
11	United States Section - IBWC (Construction Water)	0	100%	0	0	0
12	Jonathan W. Rogers Water Treatment Plant	4,631	100%	4,631	6,895	11,525
13	Riverside Canal	19,105	100%	19,105	44,006	63,111
14	Haskell R. Street WWTP Effluent	-1,460	100%	-1,460	-3,058	-4,519
15	Credit for Diversions greater than Orders (El Paso Valley)	-163	100%	-163	-814	-977
16	<b>Total Allotment Diversions Charges</b>			<b>35,641</b>	<b>72,667</b>	<b>108,308</b>
17	Diversion Allocation				300,239	380,012
18	Diversion Allocation for Conservation Credit					376,863
19	Est. Annual Conservation Credit Diversion Allocation					19,008
20	Accrued Conservation Credit Diversion Allocation					5,463
21	Total Diversion Allocation				300,239	385,475
22	<b>District Allotment Balance</b>				<b>227,572</b>	<b>277,167</b>
23	Estimate of Balance of 2008 Allocation at End-of-Year					8,612

**APPENDIX B – EXAMPLE OF EPCWID’S MONTHLY CHARGES (cont.)**

Table B-2: Average Daily CFS and Allocation Charges by Diversion Site

**EL PASO COUNTY WATER IMPROVEMENT DISTRICT Diversion Allocation Charges May 08**

Day	La Union East Canal (Texas Portion)											La Union West Canal (Texas Portion)				Three Saints Lateral Canal (Texas Portion)					Umbenhaur-Robertson WTP			Franklin Canal			Jonathan Rogers WTP			Riverside Canal			Haskell Street WWTP Water Credit		Total El Paso Valley Order					
	NM Order	TX Order	WW32 Bypass	Total Order + Bypass	LUE Avg. CFS	Excess Flow	WW32 Avg. CFS	WW32 Spill	WW32 Spill Charge	Net. Avg. CFS	Alloc. Charge	NM Order	TX Order	Avg. CFS	Alloc. Charge	NM Order	TX Order	Avg. CFS	WW23A	Net CFS	Alloc. Charge	Order	Avg. CFS	Alloc. Charge	Order	Avg. CFS	Alloc. Charge	Order	Avg. CFS	Alloc. Charge	Order	Avg. CFS	Alloc. Charge	Avg. CFS	Credit	Order	Project Water	Potential Credit	Spill	Actual Credit
	1	15	25	60	100	106	6	56	0	0	50	31	30	10	46	12	15	0	17	6	11	0	43	56	56	70	71	71	65	67	67	330	322	322	24	24	508	492	0	0
2	15	25	30	70	76	6	59	29	23	17	25	30	10	40	10	0	0	6	6	0	0	43	56	56	50	75	75	59	66	66	290	268	268	25	25	442	441	0	0	0
3	0	0	70	70	75	5	69	0	0	6	6	30	10	31	8	0	0	3	3	0	0	43	57	57	50	71	71	59	66	66	290	285	285	23	23	442	456	14	22	14
4	0	0	70	70	79	9	66	0	0	13	13	40	0	41	0	0	0	4	4	0	0	43	56	56	50	53	53	59	67	67	290	320	320	23	23	442	472	30	0	0
5	0	0	70	70	66	0	58	0	0	8	8	40	0	40	0	0	0	2	2	0	0	46	57	57	60	83	83	65	68	68	380	381	381	23	23	551	567	16	0	0
6	0	0	70	70	75	5	15	0	0	60	60	40	0	41	0	0	0	11	2	9	0	46	56	56	60	105	105	65	70	70	380	335	335	25	25	551	540	0	0	0
7	20	40	40	100	109	9	16	0	0	93	62	50	10	39	7	10	15	22	0	22	13	46	58	58	60	103	103	65	70	70	380	294	294	25	25	551	500	0	0	0
8	20	40	40	100	114	14	2	0	0	112	75	50	10	57	10	10	15	27	2	25	16	46	56	56	60	127	127	65	71	71	380	263	263	24	24	551	493	0	0	0
9	30	60	10	100	99	0	0	0	0	99	66	50	10	55	9	10	15	10	6	4	6	51	54	54	160	142	142	68	70	70	370	337	337	25	25	649	577	0	0	0
10	30	60	10	100	100	0	0	0	0	100	67	50	10	59	10	0	0	10	8	2	0	51	59	59	160	125	125	68	73	73	330	305	305	24	24	609	538	0	0	0
11	20	40	60	120	100	0	7	0	0	93	62	50	20	56	16	0	0	0	0	0	0	51	58	58	60	99	99	68	72	72	330	279	279	23	23	509	486	0	0	0
12	20	40	60	120	112	0	40	0	0	72	48	50	20	51	15	0	0	0	0	0	0	51	59	59	60	73	73	68	74	74	360	325	325	23	23	539	508	0	0	0
13	20	40	60	120	121	1	43	0	0	78	52	50	20	51	15	0	0	0	0	0	0	51	58	58	60	107	107	68	73	73	420	365	365	23	23	599	581	0	0	0
14	20	40	60	120	116	0	39	0	0	77	51	50	20	61	17	0	0	3	1	2	0	51	58	58	60	100	100	68	71	71	420	370	370	23	23	599	576	0	29	0
15	30	60	30	120	108	0	31	1	1	77	52	40	40	57	29	0	0	7	3	4	0	51	58	58	60	102	102	68	71	71	420	356	356	24	24	599	563	0	109	0
16	30	60	30	120	118	0	32	2	2	86	59	40	40	70	35	0	0	5	4	1	0	51	54	54	160	151	151	68	70	70	300	337	337	25	25	579	587	8	85	8
17	30	60	30	120	117	0	27	0	0	90	60	40	40	66	33	0	0	10	3	7	0	51	47	47	160	141	141	68	68	68	300	323	323	23	23	579	556	0	69	0
18	20	30	70	120	124	4	28	0	0	96	58	30	50	63	39	15	0	18	18	0	0	51	48	48	60	102	102	68	69	69	240	256	256	23	23	419	453	34	64	34
19	20	30	70	120	124	4	58	0	0	66	40	20	20	66	33	0	0	12	12	0	0	51	56	56	70	100	100	68	69	69	315	372	372	23	23	504	574	70	15	15
20	20	30	70	120	121	1	66	0	0	55	33	20	20	70	35	0	0	13	10	3	0	51	59	59	70	101	101	68	70	70	315	341	341	23	23	504	547	43	0	0
21	20	30	70	120	117	0	75	5	5	42	28	20	20	50	25	0	0	11	13	0	0	51	62	62	70	101	101	68	71	71	315	289	289	24	24	504	499	0	49	0
22	20	20	80	120	115	0	75	0	0	40	20	20	20	48	24	0	15	17	10	7	17	51	64	64	70	103	103	68	82	82	315	243	243	24	24	504	468	0	0	0
23	20	20	80	120	121	1	62	0	0	59	30	50	10	68	11	0	0	8	4	4	0	51	64	64	50	97	97	68	90	90	270	200	200	23	23	439	428	0	0	0
24	20	20	80	120	120	0	63	0	0	57	29	50	10	76	13	0	0	9	5	4	0	51	63	63	50	78	78	68	90	90	270	231	231	23	23	439	439	0	30	0
25	20	20	80	120	120	0	65	0	0	55	28	50	10	67	11	0	0	10	5	5	0	51	61	61	50	77	77	68	90	90	270	246	246	23	23	439	451	12	33	12
26	20	20	80	120	125	5	50	0	0	75	38	50	10	68	11	0	0	9	2	7	0	54	63	63	60	84	84	73	89	89	450	388	388	25	25	637	600	0	0	0
27	20	20	80	120	116	0	66	0	0	50	25	50	10	64	11	0	0	1	0	1	0	54	63	63	60	115	115	73	78	78	450	403	403	25	25	637	634	0	0	0
28	20	20	80	120	113	0	59	0	0	54	27	50	10	60	10	0	0	4	1	3	0	54	62	62	60	129	129	73	87	87	450	390	390	26	26	637	643	6	0	0
29	20	20	80	120	108	0	49	0	0	59	30	50	10	58	10	15	15	33	1	32	17	54	63	63	60	129	129	73	86	86	450	322	322	24	24	637	576	0	0	0
30	30	50	40	120	126	6	43	3	0	83	52	50	20	58	17	15	15	33	7	26	17	56	63	63	160	155	155	85	87	87	305	264	264	25	25	606	544	0	0	0
31	30	50	40	120	115	0	35	0	0	80	50	50	20	58	17	15	15	15	15	0	8	56	62	62	160	135	135	85	88	88	250	222	222	21	21	551	487	0	0	0
SFD	600	970	1,800	3,370	3,356	76	1,354	40	31	2,002	1,281	1,290	510	1,735	490	105	105	330	153	179	93	1,551	1,811	1,811	2,450	3,234	3,234	2,120	2,335	2,335	10,635	9,632	9,632	736	736	16,756	16,275	232	505	82
AF	1,190	1,924	3,570	6,684	6,657	151	2,686	79	61	3,971	2,542	2,559	1,012	3,441	971	208	208	655	303	355	184	3,076	3,592	3,592	4,860	6,415	6,415	4,205	4,631	4,631	21,095	19,105	19,105	1,460	1,460	33,236	32,282	460	1,002	163

**APPENDIX B – EXAMPLE OF EPCWID MONTHLY CHARGES (cont.)**

Table B-3: EPCWID El Paso Valley Daily Spills

**EL PASO COUNTY WATER IMPROVEMENT DISTRICT Diversion Allocation May 08**

Day	Riverside WW1		Riverside WW2		Fabens Waste Drain		Fabens Waste Channel		Tornillo WW2		Total Spills	Adjustment for Bustamonte and Haskill WWTP	EP Valley Spills
	Avg CFS	Spill	Avg CFS	Spill	Avg CFS	Drain Flow	Avg CFS	Spill	Avg CFS	Spill	Avg CFS	Avg CFS	Avg CFS
1	0	0		0	64	40	56	0	45	45	45	65	0
2	0	0		0	45	40	48	8	44	44	52	65	0
3	0	0		0	44	44	42	0	16	16	16	65	0
4	0	0		0	56	40	90	50	37	37	87	65	22
5	0	0		0	43	40	74	34	29	29	63	65	0
6	0	0		0	44	45	48	3	3	3	6	65	0
7	0	0		0	37	45	48	3	5	5	8	65	0
8	0	0		0	41	45	51	6	2	2	8	65	0
9	0	0		0	49	45	52	7	0	0	7	65	0
10	0	0		0	62	45	59	14	14	14	28	65	0
11	0	0		0	64	45	63	18	27	27	45	65	0
12	0	0		0	56	45	57	12	4	4	16	65	0
13	0	0		0	47	45	52	7	3	3	10	65	0
14	0	0		0	46	45	57	12	4	4	16	65	0
15	0	0		0	46	45	117	72	22	22	94	65	29
16	0	0		0	46	45	178	133	41	41	174	65	109
17	0	0		0	46	45	153	108	42	42	150	65	85
18	0	0		0	46	45	117	72	62	62	134	65	69
19	0	0		0	46	45	118	73	56	56	129	65	64
20	0	0		0	82	45	104	59	21	21	80	65	15
21	0	0		0	64	45	78	33	30	30	63	65	0
22	0	0		0	77	45	109	64	50	50	114	65	49
23	0	0		0	46	45	46	1	28	28	29	65	0
24	0	0		0	60	45	57	12	26	26	38	65	0
25	0	0		0	72	45	98	53	42	42	95	65	30
26	0	0		0	76	45	106	61	37	37	98	65	33
27	0	0		0	53	45	58	13	15	15	28	65	0
28	0	0		0	51	45	69	24	10	10	34	65	0
29	0	0		0	54	45	65	20	5	5	25	65	0
30	0	0		0	55	45	52	7	2	2	9	65	0
31	0	0		0	54	45	53	8	5	5	13	65	0
1	0	0		0	54	45	53	8	5	5	13	65	0
CFS	0	0	0	0	1,672	1,374	2,375	987	727	727	1,714	2,015	505
AF	0	0	0	0	3,316	2,725	4,711	1,958	1,442	1,442	3,400	3,997	1,002

## **APPENDIX C – EXAMPLE OF EBID’S MONTHLY CHARGES**

The following descriptions are provided for convenience only. The actual equations, procedures, and representations contained in the electronic spreadsheet named EBID\_Charges\_2008.xls and attached to this document as Exhibit 1 shall be used for determining EBID charges.

### **Description of Calculations used to determine EBID’s Allocation Charges**

Overview: EBID monthly allocation charge are calculated using information from Table C-1 – Monthly Summary, Table C-2 – Westside Canal Charge Summary, Table C-3 – Eastside Canal Charge summary, Table C-4 La Union West Charge Summary, Table C-5 – La Union East Charge Summary, Table C-6 - Bypass Summary, Table C-7 – Actual Charge Summary and Table C-8-Daily Flows. Each of the seven tables is specific for each month of the year and a single spreadsheet file (MS-EXCEL) shall be distributed by EBID to the other parties each month that contains the tables. Table C-1 is linked to Tables C-2, C-3, C-4, C-5, C-6, C-7, C-8 and previous monthly tables to provide the summary of the allocation charges and a running balance of the amount of Project Water available for diversion by EBID. Table C-8 contains the daily flow (average cfs) values for each of the flow metering sites that is used in the calculations of charges and the respective amount of water ordered by EBID and EBID and EPCWID at La Union East, La Union West, and Three Saints irrigation canals. Table C-6 contains the daily volumes of water flowing out of EBID designated Spillways and water ordered for Bypass. Table C-6 is used to determine the amount of water that is eligible for an allocation credit to EBID. The purpose of the allocation credit is to provide an accounting procedure that promotes conservation by allowing EBID to attempt to use bypass water within EBID’s order to manage its total release efficiently.

### **Table C-1: EBID Diversion Allocation Charges Summary**

The Total Order for EBID is the sum of the orders for diversion from the Rio Grande at Arrey Canal, Percha Lateral, Leasburg Canal, Eastside Canal, Westside Canal, Del Rio Lateral, California Extension, and the Greenwood, Duran, Roundtree, Dulin, Dorser, and Thurston pumps located in the Rincon Valley. The orders for each heading are lagged in time from release based on the estimated travel times. The order listed for a given diversion point is for diversion on the day that it is listed. Changes in diversion orders after the corresponding release is made shall be documented with a change order, and diverted after the appropriate travel time from the release.

The daily diversion for EBID is the sum of the actual diversions from the above listed diversion points. The minimum daily charge to EBID is 95 percent of the Total Order for the given day. The actual daily charge to EBID is the larger of the daily diversion and the minimum daily charge. The monthly charge to EBID is the sum for the month of the actual daily charges to EBID.

**Row 1:** Total actual diversion acre feet for the current month and the year to date at the Arrey Canal Diversion.

**Row 2:** Total actual diversion acre feet for the current month and the year to date at the Percha Lateral.

**Row 3:** Total actual diversion acre feet for the current month and the year to date at the Leasburg Canal Diversion.

**Row 4:** Total actual diversion acre feet for the current month and the year to date at the California Extension Lateral.

**Row 5:** Total actual diversion acre feet for the current month and the year to date at the Eastside Canal Diversion. Row 5 also contains the State line diversion totals for the EPCWID at the Three Saints East Lateral. EBID charge is the Gross Total column subtracting out the Diverted to Texas column. The amount diverted to EPCWID at the Three Saints East Lateral is determined in Table C- 3. Detailed equation that determines the amount Diverted to Texas is described in the Table C-3 Summary detail.

**Row 6:** Total actual diversion acre feet for the current month and the year to date at the Del Rio Lateral.

**Row 7:** Total actual diversion acre feet for the current month and the year to date at the Westside Canal Diversion. Row 7 also contains the State line diversions totals to EPCWID at the La Union East and La Union West Canals. EBID charge is the Gross Total column subtracting

out the Diverted to Texas column. The amount diverted to EPCWID in the La Union East Canal is determined in Table C-5 and the amount diverted to EPCWID in the La Union West Canal is determined in Table C- 4. Detailed equation that determines the amount Diverted to Texas is described in the Table C-2 Summary detail.

**Row 8:** Total actual diversion acre feet for the current month and the year to date for the River Pumps.

**Row 9:** Totals for Gross and Net diversions for Rows 1 through 8.

**Row 10:** Totals for Net diversion current month and year to date.

**Row 11:** Bypass water through designated spillways from the Arrey Canal Diversion. Totals come from Table C-6 Bypass Summary.

**Row 12:** Bypass water through designated spillways from the Leasburg Canal Diversion. Totals come from Table C-6 Bypass Summary.

**Row 13:** Adjustment for Diversion vs Delivery. This value is the difference of the Actual Monthly charge and the Actual Monthly Diversion.

**Row 14:** Total monthly and year to date allotment charge. This value is the sum of Rows 10, 11, 12 and 13.

**Row 15:** Reclamation, in accordance with this manual and the Operating Agreement, provides EBID with its total diversion allocation.

**Row 16:** EBID end of month allotment balance. Row 15 minus Row 14

**Table C-2: Average Daily CFS and Allocation Charges Westside Canal Texas and New Mexico Portions**

EBID's Allocation charge for the Westside canal is determined in this table. In order to determine the New Mexico Portion of the diversion, Texas calculations occur in Tables C-4 and C-5. The Westside canal delivers water to Texas lands through both the La Union West and the La Union East. The Texas portions are calculated in both Table C-4 for the La Union West and Table C-5 for the La Union West. Totals for each day from both Canals are added together and then a 15% carriage charge is applied. This amount is subtracted from the Westside diversion for that same day. This table also calculates the Texas Spillway 32 bypass amount. Spillway 32 initial calculation occurs in Table C-5. The initial calculation evaluates the amount of water ordered for bypass, the amount actually bypassed and the amount delivered to the La Union East. This evaluation results in the amount of water to be charged to Texas. A 15% carriage charge is also applied, then subtracted from the Westside Canal.

**Table C-3: Average Daily CFS and Allocation Charges for Eastside Canal and the Three Saints East Lateral Texas Portion**

EBID allocation charge for the Eastside Canal is determined in this table. In order to determine New Mexico portion of the diversion Texas portions are calculated in this table as well. EBID delivers water to Texas lands through the Three Saints East Canal. EPCWID's allocation charges (Texas Portion) for the Three Saints Lateral (TSL) are equal to net amount of water measured by EPCWID at the TSL metering station multiplied (prorated) by the ratio of EPCWID TSL order to the total order for TSL. The net amount of water measured at TSL is equal to the gross amount of water metered at TSL minus the gross amount of water metered at WW23A. If there is no order for water at TSL and the gross amount of flow at TSL is less than or equal to 5 cfs, then the gross amount of flow is assumed to be equal to zero. Once the Texas Portion is determined a 20% carriage charge is applied, then subtracted from the Eastside Canal Diversion leaving only the New Mexico Portion.

**Table C-4: Average Daily CFS and Allocation Charges La Union West Diversion Site**

La Union West Canal (Texas Portion): This table is used to determine the Texas Portion of the La Union West Order and Diversion. EPCWID allocation charges for La Union West Canal are equal to the gross amount of water measured by EBID at the LUW metering station multiplied (prorated) by the ratio of EBID LUW order to the total order for LUW. This prorated amount is then added to the La Union East total for the same day and displayed in Table C-2 Westside canal. These totals will be used to determine the total Diverted to Texas where it will then be subtracted from the Westside Canal Diversion leaving only the New Mexico Portion.

**Table C-5: Average Daily CFS and Allocation Charges La Union East Diversion Site**

La Union East Canal (Texas Portion): This table is used to determine the Texas Portion of the La Union East Canal. The determination of EPCWID allocation charges for La Union East Canal (LUE) is complex and requires 11 columns of measured or calculated values. The complex calculations are a result of the fact that the LUE canal services land in both Texas and New Mexico. Also, water flows in the LUE canal for bypass to the Rio Grande through WW32 and downstream diversion into the American Canal, and WW32 is used to discharge excess flow from EPCWID. In general the allocations charges for LUE are based on the net amount of water measured by EPCWID at the LUE metering station multiplied (prorated) by the ratio of the EPCWID order to the total order for LUE. The net amount of water measured at LUE is equal to the gross amount of water metered at LUE minus the gross amount of water metered at WW32. This prorated is then added to the La Union West total for the same day and displayed in Table C-2 Westside canal. These totals are used to determine the total Diverted to Texas where it will then be subtracted from the Westside Canal Diversion leaving only the New Mexico Portion.

**Table C-6: Average Daily CFS and Bypass Credit Summary**

This table contains the Amount of Bypass Ordered and Diverted for designated spillways in the Arrey and Leasburg Canals. Bypass is only a credit when an order for Bypass is made. Credit is limited to the amount of the bypass ordered. A travel time for the order is applied, then the actual diversion is used to determine whether a credit for bypass is applied. The Monthly total is used in Table C-1 if a credit is due.

**Table C-7: Actual charge**

This table contains each of the EBID diversion sites. Each site has the amount ordered and the actual amount diverted. The Total Order for EBID is the sum of the orders for diversion at Arrey Canal, Percha Lateral, Leasburg Canal, Eastside Canal, Westside Canal, Del Rio Lateral, California Extension, and the Greenwood, Duran, Roundtree, Dulin, Dorser, and Thurston pumps that divert water from the Rio Grande in the Rincon Valley. The orders for each heading are lagged in time from release based on the estimated travel times. The order listed for a given diversion point is for diversion on the day that it is listed. The daily diversion for EBID is the sum of the actual diversions from the above listed diversion points. The minimum daily charge to EBID is 95 percent of the Total Order for the given day. The actual daily charge to EBID is the larger of the daily diversion and the minimum daily charge. The monthly charge to EBID is the sum for the month of the actual daily charges to EBID. The Actual Charge is subtracted from the Total Diversion to determine the adjustment amount Row 13 of Table C-1.

**Table C-8: Average Daily CFS Daily Flows**

This contains the daily flow (average cfs) values for each of the flow metering sites that is used in the calculations of charges and the respective amount of water ordered by EBID and EBID and EPCWID at La Union East, La Union West, and Three Saints irrigation canals.

Table C-1 EBID Allocation Charges Summary

## ELEPHANT BUTTE IRRIGATION DISTRICT

WATER ALLOTMENT CHARGES

**May-08**

SUBJECT TO REVISION

Row	GROSS DIVERSIONS (AC-FT)	TO DATE	DIVERTED TO TEXAS (AC-FT)	TO DATE	NET DIVERSIONS (AC-FT)	TO DATE
<b>1 ARREY CANAL</b>	12700	34941			12700	34941
<b>2 PERCHA LATERAL</b>	115	186			115	186
<b>3 LEASBURG CANAL</b>	14884	33594			14884	33594
<b>4 CALIFORNIA EXTENTION</b>	0	0			0	0
<b>5 EASTSIDE CANAL</b>	8519	20473	-363	-877	8156	19597
<b>6 DEL RIO LATERAL</b>	496	1319			496	1319
<b>7 WESTSIDE CANAL</b>	22534	60563	-6811	-19830	15723	40733
<b>8 PUMPED FROM RIVER**</b>	0	0			0	0
<b>9 GROSS TOTAL</b>	59248	151077	-7174	-20707	52074	130370
<b>10 TOTAL CHARGES (AC-FT)</b>			NET DIVERSION	TO DATE		
			<b>52078</b>	<b>130370</b>		
<b>11 CREDIT AT ARREY (-)</b>			<b>0</b>	<b>-763</b>		
<b>12 CREDIT AT LEASBURG (-)</b>			<b>-28</b>	<b>-115</b>		
<b>13 ADJUSTMENT FOR CHARGE AT HEADING (+)</b>			<b>10</b>	<b>10</b>		
<b>14 NET ALLOTMENT CHARGE</b>			<b>52,060</b>	<b>129,502</b>		
<b>15 DISTRICT ALLOTMENT</b>				<b>280,764</b>		
<b>16 DISTRICT BALANCE</b>				<b>151,262</b>		

\*\* GREENWOOD, DURAN, ROUNTREE, DULIN, DORSAR AND THURSTON RIVER PUMPS (EBID DATA)

Table C-2 Westside Canal Diversion Charge Summary

**WESTSIDE DIVERSION CHARGE SUMMARY**

EBID

May-08

DAY	WESTSIDE CANAL (1)	TX CHARGE LUE+LUW (2)	W.W. 32 SFD*1.15 (3)	115% OF 2 (4)	EBID WATER [1-(3+4)]
1	297	43	64	49	183
2	263	35	35	40	188
3	307	6	79	7	221
4	292	0	76	0	216
5	292	0	67	0	225
6	310	0	17	0	293
7	340	63	18	72	249
8	327	85	2	98	227
9	327	75	0	86	241
10	327	77	0	89	238
11	320	73	8	84	228
12	314	58	46	67	201
13	376	62	49	71	255
14	406	68	45	78	283
15	438	68	35	78	325
16	502	94	35	108	359
17	465	93	31	107	327
18	444	97	32	112	300
19	453	81	67	93	293
20	418	77	76	89	254
21	398	53	81	61	257
22	406	44	86	51	269
23	406	41	71	47	288
24	401	42	72	48	280
25	317	39	75	45	197
26	317	49	58	56	203
27	312	36	76	41	195
28	307	37	68	43	197
29	370	40	56	46	268
30	444	69	46	79	319
31	465	67	40	77	348
SFD	11361	1672	1511	1923	7927
AC-FT	22534	3316	2997	3814	15723

Table C-3 Eastside Canal Diversion Charge Summary

**EASTSIDE DIVERSION CHARGE SUMMARY**

EBID

May-08

DAY	EASTSIDE 3 SAINTS E CANAL SFD	W.W. 23 SFD	ADJUSTED3 SAINTS E SFD	3 SAINTS E. TX-ORDER	3 SAINTS E. NM-ORDER	% TX	TX CHARGE *1.20%	EBID WATER	
1	122	17	6	15	0	15	0%	0	122
2	146	6	6	0	0	0	0%	0	146
3	124	3	3	0	0	0	0%	0	124
4	80	4	4	0	0	0	0%	0	80
5	80	2	2	0	0	0	0%	0	80
6	107	11	2	9	0	0	0%	11	96
7	163	22	0	22	15	10	60%	16	147
8	172	27	2	25	15	10	60%	18	154
9	195	10	6	10	15	10	60%	7	188
10	171	10	8	2	0	0	0%	2	169
11	160	0	0	0	0	0	0%	0	160
12	159	0	0	0	0	0	0%	0	159
13	125	0	0	0	0	0	0%	0	125
14	96	3	1	2	0	0	0%	2	94
15	132	7	3	4	0	0	0%	5	127
16	160	5	4	1	0	0	0%	1	159
17	154	10	3	7	0	0	0%	8	146
18	136	18	18	15	0	15	0%	18	118
19	132	12	12	0	0	0	0%	0	132
20	130	13	10	3	0	0	0%	4	126
21	143	11	13	0	0	0	0%	0	143
22	150	17	10	15	15	0	100%	18	132
23	148	8	4	4	0	0	0%	5	143
24	136	9	5	4	0	0	0%	5	131
25	109	10	5	5	0	0	0%	6	103
26	108	9	2	7	0	0	0%	8	100
27	110	1	0	1	0	0	0%	1	109
28	136	4	1	4	15	15	50%	2	134
29	163	33	1	32	15	15	50%	19	144
30	193	33	7	30	15	15	50%	18	175
31	155	15	15	15	15	15	50%	9	146
SFD	4295	330	153	232	120	120	50%	183	4112
AC-FT	8519	655	303	460	238	238		363	8156

\*\*ADJUSTED SFD=TOTAL ORDER OR 3SE SFD, WHICHEVER IS LESS

Table C-4 La Union West Canal Diversion Charge Summary

LA UNION WEST ORDER, DIVERSION, AND CHARGE SUMMARY

EBID

May-08

DAY	N.M. ORDER	TEXAS ORDER	TOTAL ORDER	% N.M.	% TEX	LA UNION W. SFD	N.M. CHARGE	TEXAS CHARGE
1	30	10	40	75%	25%	46	35	12
2	30	10	40	75%	25%	40	30	10
3	40	10	50	80%	20%	31	25	6
4	60	0	60	100%	0%	41	41	0
5	60	0	60	100%	0%	40	40	0
6	60	0	60	100%	0%	41	41	0
7	50	10	60	83%	17%	39	33	7
8	50	10	60	83%	17%	57	48	10
9	50	10	60	83%	17%	55	46	9
10	50	10	60	83%	17%	59	49	10
11	40	10	50	80%	20%	56	45	11
12	40	10	50	80%	20%	51	41	10
13	40	10	50	80%	20%	51	41	10
14	50	20	70	71%	29%	61	44	17
15	50	20	70	71%	29%	57	41	16
16	40	40	80	50%	50%	70	35	35
17	40	40	80	50%	50%	66	33	33
18	30	50	80	38%	63%	63	24	39
19	30	50	80	38%	63%	66	25	41
20	30	50	80	38%	63%	70	26	44
21	20	20	40	50%	50%	50	25	25
22	20	20	40	50%	50%	48	24	24
23	50	10	60	83%	17%	68	57	11
24	50	10	60	83%	17%	76	63	13
25	50	10	60	83%	17%	67	56	11
26	50	10	60	83%	17%	68	57	11
27	50	10	60	83%	17%	64	53	11
28	50	10	60	83%	17%	60	50	10
29	50	10	60	83%	17%	58	48	10
30	50	20	70	71%	29%	58	41	17
31	50	20	70	71%	29%	58	41	17
TOTAL SFD	1360	520	1880	72%	28%	1735	1258	480
TOTAL AF	2698	1031	3729			3441	2495	952

Table C-5 La Union East Canal Diversion Charge Summary

LA UNION EAST ORDER, DIVERSION, BYPASS, AND CHARGE SUMMARY											EBID
May-08											
	N.M. ORDER	TEXAS ORDER	BYPASS ORDER	TOTAL ORDER	LA UNION E SFD	W.W. 32 SFD	NET DELIVERY	% N.M.	% TEX	N.M. CHARGE	TEXAS CHARGE
1	15	25	60	100	106	56	50	38%	63%	19	31
2	15	25	30	70	76	59	40	38%	63%	15	25
3	0	0	70	70	75	69	6	0%	0%	0	0
4	0	0	70	70	79	66	13	0%	0%	0	0
5	0	0	70	70	66	58	8	0%	0%	0	0
6	0	0	70	70	75	15	60	0%	0%	0	0
7	20	40	40	100	100	16	84	33%	67%	28	56
8	20	40	40	100	114	2	112	33%	67%	37	75
9	30	60	10	100	99	0	99	33%	67%	33	66
10	30	60	10	100	100	0	100	33%	67%	33	67
11	20	40	60	120	100	7	93	33%	67%	31	62
12	20	40	60	120	112	40	72	33%	67%	24	48
13	20	40	60	120	121	43	78	33%	67%	26	52
14	20	40	60	120	116	39	77	33%	67%	26	51
15	30	60	30	120	108	31	78	33%	67%	26	52
16	30	60	30	120	118	32	88	33%	67%	29	59
17	30	60	30	120	117	27	90	33%	67%	30	60
18	20	30	70	120	124	28	96	40%	60%	38	58
19	20	30	70	120	124	58	66	40%	60%	26	40
20	20	30	70	120	121	66	55	40%	60%	22	33
21	20	30	70	120	117	75	47	40%	60%	19	28
22	20	20	80	120	115	75	40	50%	50%	20	20
23	20	20	80	120	121	62	59	50%	50%	30	30
24	20	20	80	120	120	63	57	50%	50%	29	29
25	20	20	80	120	120	65	55	50%	50%	28	28
26	20	20	80	120	125	50	75	50%	50%	38	38
27	20	20	80	120	116	66	50	50%	50%	25	25
28	20	20	80	120	113	59	54	50%	50%	27	27
29	20	20	80	120	108	49	59	50%	50%	30	30
30	30	50	40	120	126	43	83	38%	63%	31	52
31	30	50	40	120	115	35	80	38%	63%	30	50
SFD	600	970	1800	3370	3347	1354	2024	38%	62%	750	1192
AC-FT	1190	1924	3570	6684	6639	2686	4015			1488	2364

Table C-6 Bypass Credit Summary

**ELEPHANT BUTTE IRRIGATION BYPASS SUMMARY**  
**BYPASS SUMMARY**  
**May-08**

Day	Ordered Arrey Bypass	Arrey W.W. 5	Arrey W.W. 16	Actual Arrey Bypass	Actual Arrey Spill	Ordered Leasburg Bypass	Leasburg W.W. 8	Actual Leasburg Bypass	Actual Leasburg Spill	Ordered Eastside Bypass	Eastside W.W. 18	Actual Eastside Bypass	Actual Eastside Spill	Ordered Westside Bypass	Westside W.W. 31	Actual Westside Bypass	Actual Westside Spill
1	0	1	3	0	4	0	5	0	5	0	0	0	0	0	0	0	0
2	0	1	3	0	4	0	4	0	4	0	0	0	0	0	0	0	0
3	0	1	3	0	4	0	7	0	7	0	0	0	0	0	0	0	0
4	0	1	1	0	2	0	23	0	23	0	0	0	0	0	0	0	0
5	0	1	3	0	4	0	20	0	20	0	0	0	0	0	0	0	0
6	0	1	2	0	3	0	4	0	4	0	0	0	0	0	0	0	0
7	0	1	2	0	3	0	3	0	3	0	0	0	0	0	0	0	0
8	0	1	2	0	3	30	14	14	0	0	0	0	0	0	0	0	0
9	0	1	1	0	2	0	15	0	15	0	0	0	0	0	0	0	0
10	0	1	1	0	2	0	8	0	8	0	0	0	0	0	0	0	0
11	0	1	2	0	3	0	16	0	16	0	0	0	0	0	0	0	0
12	0	1	2	0	3	0	5	0	5	0	0	0	0	0	0	0	0
13	0	1	1	0	2	0	4	0	4	0	0	0	0	0	0	0	0
14	0	1	1	0	2	0	3	0	3	0	0	0	0	0	0	0	0
15	0	1	1	0	2	0	6	0	6	0	0	0	0	0	0	0	0
16	0	1	1	0	2	0	9	0	9	0	0	0	0	0	0	0	0
17	0	1	1	0	2	0	4	0	4	0	0	0	0	0	0	0	0
18	0	1	1	0	2	0	7	0	7	0	0	0	0	0	0	0	0
19	0	0	1	0	1	0	12	0	12	0	0	0	0	0	0	0	0
20	0	0	1	0	1	0	10	0	10	0	0	0	0	0	0	0	0
21	0	0	1	0	1	0	5	0	5	0	0	0	0	0	0	0	0
22	0	0	1	0	1	0	5	0	5	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	6	0	6	0	0	0	0	0	0	0	0
24	0	1	0	0	1	0	6	0	6	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	7	0	7	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	5	0	5	0	0	0	0	0	0	0	0
27	0	5	0	0	5	0	9	0	9	0	0	0	0	0	0	0	0
28	0	5	0	0	5	0	7	0	7	0	0	0	0	0	0	0	0
29	0	1	0	0	1	0	5	0	5	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	6	0	6	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	4	0	4	0	0	0	0	0	0	0	0
SFD	0	30	35	0	65	30	244	14	230	0	0	0	0	0	0	0	0
ACFT	0	60	69	0	129	60	484	28	456	0	0	0	0	0	0	0	0

Table C-7 Allocation Charges Adjustment for Amount of Water Ordered

EBID Actual Charges for May 2008

	Orders										Diversions								Minimum Charge	Actual Charge		
	Arrey	Percha	Leasburg	Eastside	Westside	Del Rio	California	Pumpers	Total	Arrey	Percha	Leasburg	Eastside	Westside	Del Rio	California	Pumpers	Total				
1	200	0	252	100	285	0	0	0	837	202	1	254	122	297	24	0	0	900	795	900		
2	165	0	260	139	268	0	0	0	832	156	0	275	146	263	0	0	0	840	790	840		
3	130	0	238	144	332	0	0	0	844	134	0	246	124	307	0	0	0	811	802	811		
4	130	0	230	80	280	0	0	0	720	134	0	232	80	292	0	0	0	738	684	738		
5	145	0	230	80	280	0	0	0	735	153	0	226	80	292	0	0	0	751	698	751		
6	160	0	192	101	292	0	0	0	745	168	4	192	107	310	0	0	0	781	708	781		
7	190	0	180	165	330	0	0	0	865	202	3	185	163	340	24	0	0	917	822	917		
8	220	0	232	174	330	0	0	0	956	216	2	226	172	327	0	0	0	943	908	943		
9	220	0	250	194	330	0	0	0	994	206	8	239	195	327	0	0	0	975	944	975		
10	220	0	250	172	328	0	0	0	970	212	5	245	171	327	0	0	0	960	922	960		
11	220	0	205	165	320	0	0	0	910	215	5	215	160	320	0	0	0	915	865	915		
12	220	0	190	165	320	0	0	0	895	218	0	200	159	314	20	0	0	911	850	911		
13	220	0	212	150	344	0	0	0	926	219	0	221	125	376	0	0	0	941	880	941		
14	220	0	220	105	415	0	0	0	960	226	2	229	96	406	0	0	0	959	912	959		
15	220	0	265	118	435	0	0	0	1,038	223	0	264	132	438	23	0	0	1,080	986	1,080		
16	185	0	280	155	495	0	0	0	1,115	153	7	285	160	502	23	0	0	1,130	1,059	1,130		
17	150	0	242	152	481	0	0	0	1,025	157	0	254	154	465	0	0	0	1,030	974	1,030		
18	150	0	230	141	440	0	0	0	961	157	0	241	136	444	0	0	0	978	913	978		
19	215	0	230	130	440	0	0	0	1,015	252	4	243	132	453	0	0	0	1,084	964	1,084		
20	280	0	230	130	422	0	0	0	1,062	287	3	246	130	418	10	0	0	1,094	1,009	1,094		
21	280	0	230	134	370	0	0	0	1,014	272	3	244	143	398	26	0	0	1,086	963	1,086		
22	280	0	282	146	375	0	0	0	1,083	272	4	268	150	406	26	0	0	1,126	1,029	1,126		
23	245	0	300	150	390	0	0	0	1,085	273	0	287	148	406	13	0	0	1,127	1,031	1,127		
24	210	0	278	140	375	0	0	0	1,003	206	0	269	136	401	0	0	0	1,012	953	1,012		
25	210	0	270	110	330	0	0	0	920	191	3	249	109	317	0	0	0	869	874	874		
26	210	0	270	110	330	0	0	0	920	191	4	255	108	317	13	0	0	888	874	888		
27	210	0	270	110	330	0	0	0	920	189	0	260	110	312	8	0	0	879	874	879		
28	205	0	270	118	330	0	0	0	923	190	0	259	136	307	8	0	0	900	877	900		
29	210	0	232	152	371	0	0	0	965	221	0	229	163	370	25	0	0	1,008	917	1,008		
30	235	0	220	190	495	0	0	0	1,140	253	0	211	193	444	2	0	0	1,103	1,083	1,103		
31	250	0	250	172	490	0	0	0	1,162	255	0	255	155	465	5	0	0	1,135	1,104	1,135		
																		SFD:	29,871		29,876	5
																		Acre-feet	59,248		59,258	10

Table C-8 EBID Allocation Charge Summary

## ELEPHANT BUTTE IRRIGATION DISTRICT

### DAILY FLOW FOR MAY-07

DAY	PERCHA	ARREY	LEASBURG	DEL RIO	EASTSIDE	WESTSIDE	L.U.EAST	L.U.WEST
	EBID	EFAS	EBID	EBID	EFAS	EFAS	EBID	EBID
1	1	202	254	24	122	297	106	46
2	0	156	275	0	146	263	76	40
3	0	134	246	0	124	307	75	31
4	0	134	232	0	80	292	79	41
5	0	153	226	0	80	292	66	40
6	4	168	192	0	107	310	75	41
7	3	202	185	24	163	340	100	39
8	2	216	226	0	172	327	114	57
9	8	206	239	0	195	327	99	55
10	5	212	245	0	171	327	100	59
11	5	215	215	0	160	320	100	56
12	0	218	200	20	159	314	112	51
13	0	219	221	0	125	376	121	51
14	2	226	229	0	96	406	116	61
15	0	223	264	23	132	438	108	57
16	7	153	285	23	160	502	118	70
17	0	157	254	0	154	465	117	66
18	0	157	241	0	136	444	124	63
19	4	252	243	0	132	453	124	66
20	3	287	246	10	130	418	121	70
21	3	272	244	26	143	398	117	50
22	4	272	268	26	150	406	115	48
23	0	273	287	13	148	406	121	68
24	0	206	269	0	136	401	120	76
25	3	191	249	0	109	317	120	67
26	4	191	255	13	108	317	125	68
27	0	189	260	8	110	312	116	64
28	0	190	259	8	136	307	113	60
29	0	221	229	25	163	370	108	58
30	0	253	211	2	193	444	126	58
31	0	255	255	5	155	465	115	58
SFD	58	6403	7504	250	4295	11361	3347	1735
AC-FT	115	12700	14884	496	8519	22534	6639	3441

**APPENDIX D – Flow Regulation Calibration at Caballo Dam**

**(See Excel File)**

# RECLAMATION

*Managing Water in the West*

Technical Memorandum No. 86-68210–2015-05

## Simulation of Rio Grande Project Operations in the Rincon and Mesilla Basins: Summary of Model Configuration and Results



U.S. Department of the Interior  
Bureau of Reclamation  
Technical Service Center  
Denver, Colorado

April 2015  
Revised December 2015

## **Mission Statements**

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

**Technical Memorandum No. 86-68210–2015-05**

# **Simulation of Rio Grande Project Operations in the Rincon and Mesilla Basins: Summary of Model Configuration and Results**

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**U.S. Department of the Interior  
Bureau of Reclamation  
Technical Service Center  
Denver, Colorado**

**April 2015  
Revised December 2015**



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U.S. Department of the Interior  
Bureau of Reclamation  
Technical Service Center  
Denver, Colorado

April 2015  
Revised December 2015

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## Appendices

- Appendix A.** Formatted Model Results for Selected Operational and Hydrologic Parameters (Digital Appendix)
- Appendix B.** Model Files and Unformatted Model Output (Digital Appendix)

# 1 Introduction

The Bureau of Reclamation (Reclamation) is currently preparing an Environmental Impact Statement (EIS) to analyze the environmental effects from continuing to implement the Rio Grande Project (Project) Operating Agreement (OA; Reclamation et al. 2008) through the remainder of its term. In addition, Reclamation will use this EIS to evaluate the environmental effects of renewing San Juan-Chama Project (SJC Project) contracts for storage in Elephant Butte Reservoir. The EIS is being prepared by Reclamation and six cooperating agencies: Elephant Butte Irrigation District (EBID); El Paso County Water Improvement District No. 1 (EPCWID); City of Santa Fe Water Division; Colorado Division of Water Resources; Texas Commissioner to the Rio Grande Compact Commission; and U.S. Section of the International Boundary and Water Commission (US-IBWC).

In support of the EIS, Reclamation, in collaboration with the United States Geological Survey (USGS), has developed a detailed hydrologic and water operations model of the Rincon and Mesilla Basins and used this model to simulate Project operations, and corresponding surface-water and groundwater conditions within the Basins, under alternative operating procedures. This technical memorandum summarizes the modeling approach used to simulate projected future Project operations under alternative operating procedures and climate scenarios in support of the EIS.

Section 2 of this technical memorandum summarizes the objectives of this modeling effort in support of the EIS. Section 3 briefly describes the study area considered in this modeling effort. Sections 4 and 5 provide an overview of Project operations and proposed alternative operating procedures under consideration in the EIS. Section 6 summarizes the modeling approach used in this study, and Section 7 summarizes model outputs provided as a digital appendix to this technical memorandum.

Selected model results relevant to the analyses being performed for this EIS are provided, in graphical and tabular form, as a digital appendix to this memorandum (Appendix A), along with complete model files and unformatted outputs for each simulation described here (Appendix B). The results provided here may be used for evaluation of the effects of the alternative operating procedures under consideration in the EIS on the human environment and endangered species. Detailed analysis of model results will be performed as part of the EIS and is beyond the scope of this memorandum.

## **2 Modeling Objectives**

The objective of this modeling effort is to provide projections of potential future surface water and groundwater conditions in the Rincon and Mesilla Basins under alternative operating procedures of the Project, and under a range of projected future climate and hydrologic conditions, in support of the EIS.

### **3 Study Area: Rio Grande Project and the Rincon and Mesilla Basins**

The Project serves irrigated lands in the Rincon, Mesilla, and El Paso<sup>1</sup> Valleys, as well as providing water to the City of El Paso for municipal and industrial uses. The Project also delivers water to International Dam for diversion to Mexico.

The extent of the Project and key Project facilities are illustrated in Figure 1. The Project includes two storage dams and reservoirs, one hydropower generation facility, five diversion dams, and a complex network of conveyance and drainage channels, including canals, laterals, and open drains. The Project begins at Elephant Butte Reservoir, located near Elephant Butte, NM. Diversion dams and conveyance and drainage channels are located in the Rincon Valley of New Mexico (Percha Dam), the Mesilla Valley of New Mexico and Texas (Leasburg Dam, Mesilla Dam, and American Dam), and the El Paso Valley of Texas (International Dam). The Project terminates in Hudspeth County, TX near the town of Fort Hancock.

The Rio Grande and Project lands are underlain by an alluvial aquifer system, which is in turn underlain by deeper basin-fill aquifers (Hawley et al. 2001, Hawley and Kennedy 2004). Groundwater from these aquifers is the primary supply for municipal and domestic uses in the region and for irrigation outside the Project. In addition, irrigators within both the New Mexico and Texas portions of the Project often supplement Project surface-water deliveries with groundwater from privately-owned wells. Supplemental groundwater pumping is authorized and managed by the States, independently of the Federal Project. As a result, surface-water management in the Rincon and Mesilla Valleys—including Project operations—is carried out independently of groundwater regulation and management.

Groundwater use in Texas is governed by the so called “rule of capture” (Texas Water Code Section 36.002), which states that a landowner owns the groundwater beneath the surface of his or her land as real property, and may pump that water so long as that pumping does not cause waste or malicious drainage of other property or negligently cause subsidence. The area served by the Project lies within Texas’s Groundwater Management Area 5 (GMA 5); GMA 5 has not developed groundwater conservation districts or taken other steps to limit groundwater pumping within the GMA (Texas Water Development Board 2015). As a result, Project farmers in Texas are free to pump groundwater from privately-owned wells on their lands to supplement Project surface-water supplies.

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<sup>1</sup> The El Paso Valley extends from Paso del Norte (also known as El Paso Narrows) southeast to approximately Fort Quitman, TX. The name El Paso Valley commonly refers to the United States portion of the topographic valley; the Mexican portion of the valley is commonly referred to as Juarez Valley.

The rights of Project farmers in New Mexico to supplement Project surface-water supplies with groundwater from privately-owned wells are subject to regulation and administration by the State of New Mexico. In 1980, the New Mexico Office of the State Engineer declared the Lower Rio Grande Underground Basin, within which permits would be required for any further groundwater development. Groundwater use that was initiated prior to the declaration of the underground basin was allowed to continue. The amount of water that can be pumped using pre-basin groundwater rights is currently being determined through a basin adjudication process by the State of New Mexico (Judicial Branch of New Mexico, 2015). In a settlement agreement associated with this ongoing water-rights adjudication, New Mexico allocated a Farm Delivery Requirement (FDR) of 5.5 AF/year and a Consumptive Irrigation Requirement (CIR) of 4.0 AF/year for pecan crops irrigated from a groundwater source established prior to the declaration of the groundwater basin. A final decree has not yet been issued in the adjudication; therefore, the adjudication does not yet form a basis for water-rights administration.

In the interim, the New Mexico Office of the State Engineer has the authority to administer water rights under its Active Water Resource Management (AWRM) program. However, basin-specific AWRM rules and regulations have not yet been finalized (New Mexico Office of the State Engineer / Interstate Stream Commission 2015). AWRM therefore does not yet provide a tool for administration of groundwater rights in the Rincon and Mesilla Basins. In 2004, the New Mexico State Engineer issued an Order (D'Antonio 2004) requiring metering of all groundwater diversions from the Lower Rio Grande Watermaster District by March 1, 2006. Although metering requirements are in effect per this Order, it has not been used to limit groundwater pumping. Therefore, as in Texas, Project farmers in New Mexico are free to pump groundwater from privately-owned wells on their lands to supplement Project surface-water supplies.

Previous studies indicate a strong hydraulic connection between the Rio Grande and the underlying groundwater aquifers in the areas served by the Project, particularly in the Rincon and Mesilla Basins (Conover 1954, Haywood and Yager 2003, SSPA 2007, Hanson et al. 2013). Groundwater pumping in the Rincon and Mesilla Basins results in capture (depletion) of Project surface-water supplies, which in turn affects the quantity of Project surface-water that can be delivered to authorized points of diversion. Conversely, Project operations affect the timing, distribution, and volume of groundwater recharge that occurs as seepage from surface-water channels, including the Rio Grande and unlined canals and laterals, and as deep percolation of applied irrigation water. Project operations also affect the timing, distribution, and volume of surface-water deliveries within the Project, which in turn affect incentives for groundwater pumping, as authorized by the States. Increased groundwater demand in the Rincon and Mesilla Basins over recent decades has been documented (e.g., D'Antonio 2005) and is expected to continue in the future, especially during periods of low Project surface water deliveries.

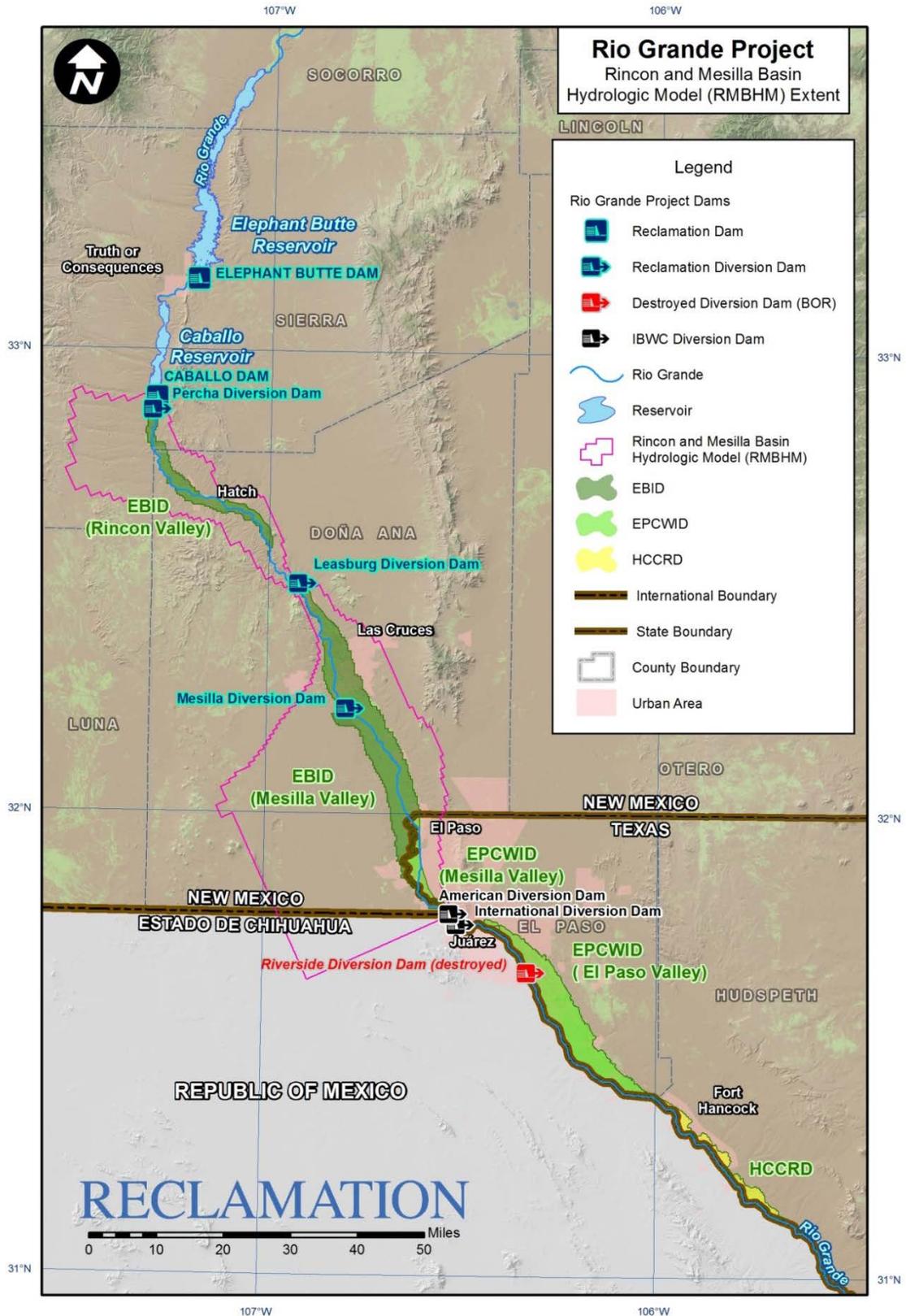


Figure 1: Overview of Rio Grande Project geographical extent and major facilities with outline of RMBHM model extent (active model grid cells).

## 4 Overview of Rio Grande Project Operations

The Project provides surface water for irrigation in southern New Mexico, and for irrigation, municipal, and industrial uses in western Texas. It also provides for the delivery of surface water to the Republic of Mexico under the 1906 Convention (United States of America and Republic of Mexico 1906). The Project also provides hydropower generation as a secondary function.

Operation of the Project involves four primary functions:

- Capture and storage of Rio Grande streamflow in Elephant Butte and Caballo Reservoirs;
- Allocation of Project water to EBID, EPCWID, and Mexico;
- Release of Project water to satisfy delivery orders from EBID, EPCWID, and the US IBWC on behalf of Mexico; and
- Diversion<sup>2</sup> of Project water from the Rio Grande and delivery<sup>3</sup> of Project water to individual farms and municipal water treatment facilities for beneficial use.

In addition to these primary functions, Project operations include monitoring of river flows, diversions, and return flows at locations throughout the Project and accounting for charges and credits to Project allocation balances. The Project also provides flood control benefits, and Elephant Butte Reservoir serves as an accounting point for the Rio Grande Compact. Lastly, Reclamation allows storage of SJC Project water in Elephant Butte Reservoir under agreements with the Albuquerque-Bernalillo County Water Authority (Authority) and City of Santa Fe.

It should be noted that in addition to allocation, diversion, and delivery of Project surface-water to EBID, EPCWID, and Mexico, seepage and drainage water from Project lands in El Paso Valley is delivered to Hudspeth County Conservation and Reclamation District No. 1 (HCCRD)<sup>4</sup>. Because HCCRD only receives seepage

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<sup>2</sup> Throughout this document, the term *diversion* refers to specifically the withdrawal of Project surface-water from the Rio Grande into an authorized Project conveyance facility at its heading.

<sup>3</sup> Throughout this document, the term *delivery* refers specifically to the withdrawal of Project surface-water from an authorized Project conveyance facility at a point of beneficial use (e.g., farm head gate or municipal water treatment plant intake).

<sup>4</sup> The United States and HCCRD entered into a Warren Act Contract in 1924, and amended in 1951, which provides for the use of Project Water by the HCCRD. The Warren Act Contract originally provided that “[t]he United States will deliver to [HCCRD] at the terminus of the Tornillo Main canal, during the irrigation season of 1925 and thereafter during each irrigation season as established on the Rio Grande project, such water from the project as may be available at said terminus *without the use of storage from Elephant Butte reservoir*” (emphasis added). The

and drainage water from EPCWID and does not receive a direct allocation of Project water, deliveries to HCCRD do not affect primary Project operations. The modeling and analysis described here therefore does not consider delivery to HCCRD.

The usable water available to the Project is determined according the accounting procedures specified in the Rio Grande Compact. Project releases, diversions, and deliveries depend on the usable water available to the Project as well as water demands within the Project, and are subject to limits specified by various statutory controls.

From 1916 through 1979, Reclamation operated all aspects of the Project. Reclamation determined the annual allotment of Project water per acre of authorized land and delivered the annual allotment to farm gates. In 1979 and 1980, Reclamation entered into contracts with EBID and EPCWID (collectively, the Districts), respectively, which transferred operation and maintenance responsibilities for Project conveyance and drainage systems to the Districts. Beginning in 1980, Reclamation determined annual diversion allocations to each district and delivered water to the respective authorized points of diversion; the Districts were then responsible for conveying water from the point of diversion to individual water users.

In the early 1980s, Reclamation developed a procedure to determine annual diversion allocations to EBID, EPCWID, and Mexico based on two linear regression relationships between Project releases and Project diversions and deliveries, respectively. The D-1 Curve is a linear regression relationship between annual Project releases from Caballo Dam and annual Project deliveries to lands within the US and to the heading of the Acequia Madre for diversion to Mexico. The D-2 Curve is a linear regression relationship between annual Project releases from Caballo Dam and annual gross Project diversions from river headings. Both relationships were developed based on Project operations data for the period 1951-1978 (inclusive).

During the period 1980-2007, annual Project diversion allocations to Mexico, EBID, and EPCWID were determined each year from the total amount of usable water in Project storage available for release during that year based on the D-1 and D-2 Curves. The D-1 Curve was used to estimate the total available annual delivery to Project lands in the United States and to the heading of the Acequia Madre from the usable water available for release; the D-2 Curve was used to estimate the total available annual diversion at Project diversion points from the usable water available for release.

Pursuant to the 1906 Convention, the annual allocation to Mexico during this period was 60,000 acre-feet (AF)/year, except under extraordinary drought

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1951 amendments to the Warren Act Contract added language specifying that the United States could deliver seepage or drainage water from land irrigated within the EPCWID, via canal, to HCCRD.

conditions. During extraordinary drought conditions, Mexico received a diversion allocation equal to 11.3486% of the sum of the total quantity of water delivered to lands within the United States plus delivery to the heading of the Acequia Madre. Between 1939 and 2014, Project allocations and deliveries to Mexico were reduced in approximately 30% of years, including significant reductions in 2012, 2013, and 2014 (Congressional Research Service 2015). Annual diversion allocations to EBID and EPCWID were then calculated from the quantity of water available for diversion after delivery obligations to Mexico were fully satisfied. Calculation of the allocation to each district was based on the percentage of authorized acreage within each district, or 88/155<sup>ths</sup> [57%] of the estimated available annual Project diversion allocated to EBID and 67/155<sup>ths</sup> [43%] to EPCWID. Reclamation made adjustments to annual diversion allocations in some years as needed to optimize Project operations and meet Project needs in response to actual Project performance (i.e., actual quantity of water available for diversion under current-year hydrologic conditions). Reclamation informed both districts of any adjustment made to the annual allocation procedure.

Beginning in 2008, Project operations have been carried out based on the procedures detailed in the Project OA (Reclamation et al. 2008) and corresponding Project Operations Manual (Reclamation et al. 2012). The OA is a written description of the procedures by which Reclamation operates the Rio Grande Project, including allocation of Project water to EBID, EPCWID, and Mexico; release of Project water from storage; delivery of Project water to authorized points of diversion; and accounting of allocation charges and credits. The Operations Manual further defines the procedures outlined within the OA for day-to-day operation of the Project. The OA and Operations Manual are reviewed annually and updated as needed to optimize Project operations consistent with applicable water rights, state and federal laws, and international treaties. Revision of the OA or Operations Manual requires unanimous consent of the Rio Grande Project Allocation Committee, which consists of one representative each from Reclamation, EBID, and EPCWID.

Operating procedures defined in the OA are largely consistent with prior operating practices during the period 1980-2007. The procedure used to determine the annual diversion allocation to Mexico is identical under the OA and prior operating practices. Similarly, the quantity of water available for diversion at Project diversion points each year is calculated from the estimated annual release of Project water according to the D-2 Curve, and the annual diversion allocations to EBID and EPCWID are calculated from the estimated water available for diversion after delivery obligations to Mexico are fully satisfied.

Two key provisions of the OA, however, deviate from prior operating practices. First, the OA provides carryover accounting for the unused balance of annual diversion allocation to EBID and EPCWID. Under prior operating practices, annual diversion allocations were calculated based only on the estimated release

of Project water for the current year; the unused balance of each districts annual diversion allocation, if any, was implicitly relinquished at the end of each calendar year. Under the OA, the unused balance of each district's annual diversion allocation, if any, is carried over and becomes part of the district's total diversion allocation the following year. The OA specifies that carryover balance may be accumulated by either district up to 60% of each district's respective full annual allocation, or up to 305,918 AF for EBID and 232,915 AF for EPCWID; carryover balance in excess of this limit is transferred to the other district. The carryover provision is intended to encourage water conservation within the Project by allowing each district to maintain its unused allocation balance up to a specified limit.

Second, the OA provides for adjustment of annual diversion allocations to EBID and EPCWID to account for changes in annual Project performance—i.e., changes in the amount of water actually available for diversion compared to the estimated available diversion based on the D-2 Curve. The OA represents Project performance using the diversion ratio, which is calculated as the ratio of total annual Project allocation charges to total annual Project release. The diversion ratio adjustment provision of the OA allows for adjustment of the annual Project allocations to EBID and EPCWID so as to maintain district diversion allocations to EPCWID at a level consistent with historical Project performance as represented by the D-2 Curve. When the actual diversion ratio is greater than the D-2 Curve, EBID receives an increase in annual allocation compared to prior operating practices; when the diversion ratio is less than the D-2 Curve, EBID receives a decrease in allocation. The diversion ratio adjustment provision of the OA therefore mitigates potential negative effects of changes in Project performance, which result predominately from the actions of individual landowners within EBID, by ensuring that Project allocations and deliveries to EPCWID remain consistent with historical Project performance.”

Project water accounting under the OA is consistent with water accounting under prior operating practices. Project water accounting involves the calculation of charges against the Project allocation balances of EBID, EPCWID, and Mexico, as well as credits to the allocations balances of EBID and EPCWID, consistent with each entity's use of Rio Grande surface water. Allocation charges reflect the amount of surface water diverted from the Rio Grande, and allocation credits reflect the amount of water bypassed or returned to the Rio Grande and available for diversion at a downstream diversion point. In general, allocation charges are computed as the greater of the amount of water ordered for diversion at a specified diversion point and the amount of water actually diverted, whereas allocation credits are computed as the lesser of the amount of water ordered or bypassed at specified bypass points and the actual amount of water bypassed or returned to the Rio Grande. Dependence of allocation charges and credits on corresponding Project water orders promotes efficient operation of the Project by creating an incentive to divert all water ordered.

Specific exceptions to these general accounting procedures are summarized below.

First, charges to EBID and EPCWID for water diverted to Eastside and Westside Canals depend on whether one or both districts have ordered water. EPCWID receives water in Mesilla Valley as bypass from EBID via the Eastside and Westside Canal systems. If only EBID has ordered water, EBID is charged as described above. If both districts have ordered water, EBID is charged for water diverted at the canal heading as described above and is credited for water bypassed to EPCWID in addition to water bypassed to the Rio Grande. EPCWID is then charged for water received as bypass from EBID; EPCWID is credited for water bypassed to the Rio Grande from the Westside Canal system at a designated location on the La Union East Canal (Reclamation et al. 2008), which contributes to the water available for diversion downstream at American and International Dams. Lastly, if only EPCWID has ordered water, EPCWID is charged at the canal heading, rather than at the district boundary, and is credited for water bypassed to the Rio Grande.

Second, charges to EPCWID for water diverted at American Dam for use in El Paso Valley are not determined at the heading of American Canal. For consistency with historical water distribution and accounting practices, charges are determined at four locations that receive water from American Canal: the intakes to the Umbenhaurer-Robertson and Jonathon W. Rogers water treatment facilities and the headings of Riverside and Franklin Canals. In order to promote maximal use of Project water available to the United States, EPCWID is encouraged to divert all flow reaching American Dam that is not allocated for delivery to Mexico. EPCWID is then charged for all water reaching the four accounting locations listed above, regardless of corresponding diversion orders. In the event that diversions to American Canal exceed the district's diversion order, EPCWID is credited for the unused portion of water diverted in excess of its order. Unused water in excess of EPCWID's order is computed by analysis of hydrographs of flow exiting the downstream end of the district.

Third, in addition to credit for water bypassed to the Rio Grande from the Eastside and Westside systems and for unused diversion in excess of its order at American Dam, EPCWID receives a credit towards their Project allocation balance for water savings associated with construction of the American Canal Extension. The original American Canal, completed in 1938, conveys water from American Dam approximately two miles south to Franklin Canal; the American Canal Extension, completed in 1998, carries water from the original terminus of the American Canal approximately 12 miles further south to Riverside Canal. Historically, water was diverted from the Rio Grande to Riverside Canal at Riverside Dam. The American Canal Extension is concrete lined and provides for surface-water savings through reduced seepage losses compared to historical conveyance in the Rio Grande and diversion of water at Riverside Dam. The annual credit towards EPCWID's allocation balance for water savings from the

American Canal Extension is calculated based on annual flow in the American Canal.

Lastly, in the event that only one district or Mexico has ordered water, the charge against that entity's Project allocation balance is equal to the greater of the amount of water released from Caballo Dam or the amount of water diverted at the specified diversion point(s).

In addition to storing and releasing water for the Project, Reclamation also allows storage of SJC Project water in Elephant Butte Reservoir. In 1983, Reclamation and the Authority entered into a 25-year agreement (Contract No. 3-CS-53-01510) to allow the Authority to store up to 50,000 acre-feet of water in Elephant Butte Reservoir. The amount accounted as non-Project inflow to Elephant Butte Reservoir is equal to the amount released from upstream minus agreed-upon transport losses for the conveyance of non-Project water to the reservoir, unless that water was moved downstream for reasons that benefit Reclamation (such as to support riverine habitat for endangered species). The amount accounted as non-Project water stored by the Authority is then calculated as the Authority's previous non-Project storage, plus non-Project inflows, and minus evaporation of non-Project water from storage.

The 1983 agreement between Reclamation and the Authority expired in 2008. Since then, water storage in Elephant Butte Reservoir by the Authority has been managed under annual contract extensions, with the intent to execute another long-term agreement. Current storage is under an extension that allows storage through February 2016, ending on March 1, 2016.

In recent years, the City of Santa Fe (City) has also stored water in Elephant Butte, first under a sublease to the Authority's agreement, and then under annual agreements of its own. Since the spring of 2014, Santa Fe has not had water in Elephant Butte. The City has not requested future storage.

## 5 Summary of Proposed Alternatives Simulated in Support of EIS

The EIS will analyze environmental effects associated with continuing to implement OA for the remainder of its term through December 31, 2050, and associated with the renewal of SJC Project storage contracts that provide for storage of up to 50,000 acre-feet of SJC Project water in Elephant Butte Reservoir. The EIS will consider five alternatives, including a No Action alternative and four action alternatives. The No Action alternative reflects continuation of current operating procedures, as defined by the OA (Reclamation et al. 2008) and current Project Operations Manual (Reclamation et al. 2012), and with renewal of contracts for storage of up to 50,000 acre-feet of SJC Project water in Elephant Butte Reservoir. Action alternatives reflect potential changes in Project operating procedures and/or storage of SJC Project water in Elephant Butte. Alternatives are summarized below in Table 1.

Each alternative is simulated using two tools: a detailed hydrologic and water operations model of the Rincon and Mesilla Basins (Basins), which simulates Project operations and surface-water and groundwater conditions within the Basins; and a spreadsheet post-processing tool, which computes total storage in Elephant Butte Reservoir, including Project water, Rio Grande Compact Credit water and SJC Project water. Each alternative operating procedure is simulated by implementing a consistent set of Project allocation and accounting procedures within the Rincon and Mesilla Basins Hydrologic Model (RMBHM; see Section 6). RMBHM simulates Project operations and corresponding surface-water and groundwater conditions under projected future climate and hydrologic conditions according to the specified procedures. In the simulations carried out in support of the EIS, RMBHM does not account for SJC Project water in Elephant Butte Reservoir. SJC Project water and total storage in Elephant Butte Reservoir under each alternative are computed using a post-processing tool which calculates available storage for SJC Project water.

Unique simulations with RMBHM and the associated post-processing tool were carried out for Alternatives 1, 3, 4, and 5. Alternative 2 does not include storage of SJC Project water in Elephant Butte Reservoir; Alternative 2 is therefore represented by the RMBHM results from Alternative 1, without applying the post-processing tool for calculation of SJC Project water.

Table 1: Summary of Project Operating Alternatives Simulated In Support of the EIS

<b>Alt.</b>	<b>Name</b>	<b>Description</b>
1	No Action	<ul style="list-style-type: none"> <li>• Continue to implement the diversion ratio adjustment provision of the OA in computing annual diversion allocations;</li> <li>• Continue to implement the carryover accounting provision of the OA allowing carryover of unused allotment balance from one year to the next;</li> <li>• Continue to store up to 50,000 acre-feet per year of SJC Project water in Elephant Butte Reservoir.</li> </ul>
2	No Action without SJC Project Storage	<ul style="list-style-type: none"> <li>• Continue to implement the diversion ratio adjustment provision of the OA in computing annual diversion allocations;</li> <li>• Continue to implement the carryover accounting provision of the OA allowing carryover of unused allotment balance from one year to the next;</li> <li>• Do not store SJC Project water in Elephant Butte Reservoir.</li> </ul>
3	No Action without Carryover Provision	<ul style="list-style-type: none"> <li>• Continue to implement the diversion ratio adjustment provision of the OA in computing annual diversion allocations;</li> <li>• Do not implement the carryover accounting provision of the OA – relinquish unused allotment balance at the end of each calendar year and eliminate carryover allocations;</li> <li>• Continue to store up to 50,000 acre-feet per year of SJC Project water in Elephant Butte Reservoir.</li> </ul>
4	No Action without Diversion Ratio Adjustment	<ul style="list-style-type: none"> <li>• Do not implement the diversion ratio adjustment provision of the OA – compute annual diversion allocations based only on the D1 and D2 regression equations without adjustment for variations in Project performance;</li> <li>• Continue to implement the carryover accounting provision of the OA allowing carryover of unused allotment balance from one year to the next;</li> <li>• Continue to store up to 50,000 acre-feet per year of SJC Project water in Elephant Butte Reservoir.</li> </ul>
5	Prior Operating Practices	<ul style="list-style-type: none"> <li>• Do not implement the diversion ratio adjustment provision of the OA – compute annual diversion allocations based only on the D1 and D2 regression equations without adjustment for variations in Project performance;</li> <li>• Do not implement the carryover accounting provision of the OA – relinquish unused allotment balance at the end of each calendar year and eliminate carryover allocations;</li> <li>• Continue to store up to 50,000 acre-feet per year of SJC Project water in Elephant Butte Reservoir.</li> </ul>

## 6 Summary of Modeling Approach

Modeling software was selected and configured to simulate Project operations and hydrology, including surface-water and groundwater conditions, in the Rincon and Mesilla Basins under each of the alternative operating procedures proposed for the EIS. For each alternative, simulations were carried out under a range of projected future climate conditions. Model results were post-processed and compiled to facilitate comparison of Project operations and surface-water and groundwater resources under the No Action Alternative to conditions under each action alternative. Parameters provided by the model output and post-processing analysis include:

- Project storage, non-Project storage, and total storage in Elephant Butte and Caballo Reservoirs;
- Water surface elevation and area of Elephant Butte Reservoir;
- Reservoir releases from Caballo Dam;
- Diversion of Project surface-water to EBID, EPCWID, and Mexico;
- Delivery of Project surface-water to irrigated lands within EBID and to irrigated lands in the Mesilla Valley portion of EPCWID;
- Groundwater pumping for irrigation of groundwater-only irrigated lands in New Mexico and for supplemental irrigation of irrigated lands within EBID and irrigated lands in the Mesilla Valley portion of EPCWID;
- Changes in groundwater storage and water table elevations in Rincon and Mesilla Valleys.

In addition to analysis of surface-water resources, model results also provide a basis for analysis of potential effects of proposed alternatives on the human environment and socioeconomics, ecological conditions, and other environmental resources.

### 6.1 Model Selection

Simulation of Project operations requires a hydrologic modeling approach that accounts for interactions and feedbacks between surface-water and groundwater management and use. In response to this requirement, Reclamation, in collaboration with the USGS, developed the RMBHM to simulate Project operations and corresponding surface-water and groundwater conditions in the Rincon and Mesilla Basins. RMBHM builds on previous hydrologic models developed by the (NMOSE; SSPA 2007) and the USGS (Hanson et al. 2013).

RMBHM uses integrated hydrologic modeling software that is based on the USGS Modular Groundwater Model, MODFLOW. This software, the One Water Hydrologic Flow Model (MF-OWHM; Hanson et al. 2014), has been enhanced with additional software features developed and implemented by Reclamation in collaboration with USGS (Ferguson et al. 2014). New software features implemented by Reclamation provide the capability to simulate Project surface-water operations, including Project storage, allocation, release, diversion, delivery, and water accounting. New features are linked to existing features of MF-OWHM, including the Farm Process (FMP) and streamflow routing package (SFR), to allow dynamic simulation of both surface-water and groundwater management and use, including the coupled use and movement of surface water based on reservoir supply, agricultural demand, and specified Project operating procedures.

RMBHM simulates interactions and feedbacks between Project surface-water operations and groundwater recharge, incentives for groundwater pumping for supplemental irrigation, and groundwater/surface-water interactions in the Rincon and Mesilla Basins. Dynamic representation of these interactions and feedbacks is necessary to accurately represent Project operations and potential effects of alternative operating procedures on groundwater and surface-water resources.

## 6.2 Model Configuration

RMBHM utilizes the most recent release of the MF-OWHM (Hanson et al. 2014), with additional software features developed and implemented by Reclamation in collaboration with USGS. RMBHM was developed by configuring MF-OWHM to represent the physical and hydraulic properties specific to the groundwater and surface-water systems of the Rincon and Mesilla Basins and the operating procedures of the Project. Model configuration includes the extent and discretization of the simulated area (spatial domain) and simulation period (temporal domain), as well as the physical and hydraulic properties (constant parameters) of the Rincon and Mesilla Basins.

The RMBHM spatial domain is identical to that of previous model versions<sup>5</sup> developed by NMOSE and USGS (SSPA 2007; Hansen et al. 2013). The spatial domain encompasses the Rincon Valley of New Mexico and the Mesilla Valley of New Mexico and Texas, including all authorized Project lands within the Arrey, Leasburg, Eastside, and Westside Canal service areas. The model domain includes the Rio Grande, Project conveyance facilities (canals and laterals), and Project drainage facilities between Caballo Dam and Paso del Norte (El Paso Narrows), as well as all diversion points serving Project users in the United States: Percha Dam, Leasburg Dam, Mesilla Dam, and American Dam. It should

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<sup>5</sup> The term “model version” refers here to the specific combination of modeling software and its implementation (configuration) to simulate surface-water and groundwater hydrology of a given area.

be noted that the model spatial domain does not include International Dam, where Project water is diverted from the Rio Grande for use in Mexico. International Dam is located approximately 1.5 miles downstream of American Dam; Project diversions to Mexico are approximated based on simulated flow in the Rio Grande out of the model domain.

Consistent with previous model versions, the RMBHM spatial domain is discretized on a uniform grid with lateral resolution of one quarter mile (1320 ft) in both the X- and Y-dimensions: each model grid cell is a square covering an area one quarter mile by one quarter mile, equal to 40 acres. The model grid is rotated 24 degrees counter-clockwise from the local meridian to align with the dominant orientation of topographic and hydrogeological features of the Rincon and Mesilla Basins. In the vertical dimension, the aquifer system is represented by five model layers of varying thickness and extent. The uppermost layer represents the Rio Grande alluvial aquifer system within the Rincon and Mesilla Valleys, and lower layers represent deeper basin-fill deposits. The vertical discretization of RMBHM was adopted directly from previous model versions and is based on the hydrogeologic framework developed by Hawley and Kennedy (2004).

RMBHM represents surface-water channels within the model spatial domain—including the Rio Grande, canals and laterals, wasteways, and open drains—as a discrete network of channel segments and reaches using the SFR package in MF-OWHM. The network of canals, laterals, wasteways, and drains represented in RMBHM was adopted from previous model versions, where previous modeling teams selected channels primarily based on their rated capacity and acreage served (SSPA 2007). As in previous model versions, RMBHM explicitly represents the majority of larger canals and laterals within the model domain, while excluding smaller laterals that generally have rated capacities less than 40 cfs and/or serve relative small areas (refer to SSPA 2007, Appendix M, for details). RMBHM utilizes the lumped representation of surface-water deliveries developed by NMOSE for a previous model version, with surface-water deliveries to Project lands occurring at 30 locations throughout the conveyance network (SSPA 2007). Calibration and sensitivity analysis carried out during previous modeling efforts demonstrate that the simplified and lumped representation of the surface-water conveyance and drainage network was sufficient to represent surface-water operations and surface-water/groundwater interactions within the Rincon and Mesilla Basins (SSPA 2007, Hanson et al. 2013).

It should be noted that the model domain does not encompass Project lands in El Paso Valley, downstream of Paso del Norte (also known as El Paso Narrows). As summarized above, previous studies indicate significant interaction and feedbacks between Project operations and groundwater storage and use in the Rincon and Mesilla Valleys. By contrast, Project water delivered to EPCWID for use in El Paso Valley is diverted at American Dam, located at the southern end of Mesilla Valley upstream of Paso del Norte. Water diverted at American Dam is conveyed

to Project accounting points in El Paso Valley<sup>6</sup> via the American Canal, which is concrete-lined and therefore assumed not to interact with the underlying groundwater aquifer. Drainage and return flows from EPCWID in El Paso Valley do not contribute to downstream Project diversions and therefore do not affect Project diversion orders or accounting. While groundwater/surface-water interactions in El Paso Valley may affect surface-water deliveries and return flows within EPCWID and the availability of Project seepage and drainage water to HCCRD, these interactions do not affect the quantity or quality of Project water available for diversion, accounting of Project charges and credits, nor the allocation of project surface-water supplies between EBID, EPCWID, and Mexico. For these reasons, Project deliveries to EPCWID lands in El Paso Valley are not explicitly represented in the model domain. Instead, Project demands and deliveries in El Paso Valley are represented by a specified diversion demand at American Canal (see Section 6.5).

In order to support comparison of proposed operating alternatives for the EIS, the RMBHM temporal domain encompasses the full term of the OA, from 2008-2050. The simulation period extends from the start of the 2007-2008 non-irrigation season (November 1, 2007) through the end of the 2050 irrigation season (October 31, 2050). The temporal domain is discretized into seasonal stress periods and approximately monthly time steps. Each simulated year contains two seasonal stress periods: a non-irrigation season stress period from November through February (120.25 days), and an irrigation season stress period from March through October (245 days). Irrigation stress periods are divided into eight nominally monthly time steps of 30.625 days each and non-irrigation stress periods are divided into four nominally monthly time steps of 30.0625 days each.

Subsurface and channel hydraulic properties are held constant throughout the model simulation. Hydraulic properties were largely adopted from previous model versions, which were subjected to extensive calibration and verification; however, selected parameters were adjusted during development and evaluation of RMBHM to improve simulation of Project surface-water operations (see Section 6.3 below). Subsurface hydraulic properties include horizontal hydraulic conductivity, the ratio between horizontal and vertical hydraulic conductivity, specific storage, and specific yield; channel hydraulic properties include channel bed hydraulic conductivity as well as channel geometry, slope, and roughness, which affect stream stage (head) and wetted perimeter, and thus seepage across the channel bed.

RMBHM simulates the transient groundwater and surface-water responses to spatially and temporally varying hydrologic stresses, including Project surface-water releases and diversions and both agricultural and non-agricultural groundwater pumping within the model domain (see Section 6.4 below). As in

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<sup>6</sup> Project allocation charges in El Paso Valley are computed at the following locations: Umbenhauer-Robertson Water Treatment Plant intake, intake to Jonathon W. Rogers Water Treatment Plant intake, Franklin Canal heading, and Riverside Canal heading.

previous model versions, non-agricultural groundwater stresses such as domestic and municipal well groundwater pumping rates and mountain-front recharge are specified as seasonally-varying inputs<sup>7</sup>. By contrast, irrigation-related stresses such as Project releases, diversions, and deliveries, farm well pumping rates, and farm net recharge are simulated dynamically by RMBHM and updated at each time step. Irrigation stresses are calculated based on specified crop irrigation requirements and simulated Project surface-water operations. The crop irrigation requirements for each Project service area in the Rincon and Mesilla Basins are specified for each stress period as a time-varying input; Project storage is simulated for each time step based on specified monthly reservoir inflows, precipitation and evaporation rates, non-Project water in storage, and simulated Project releases; and groundwater pumping for irrigation is calculated as the difference between the total farm delivery requirement and simulated surface-water delivery.

### 6.3 Constant Model Parameters

In addition to configuration of the model's spatial and temporal domain, RMBHM requires parameters representing the physical and hydraulic properties throughout its spatial domain. Parameters representing physical and hydraulic properties are held constant throughout the model simulation period. Constant model parameters include:

- Subsurface Properties:
  - aquifer hydraulic conductivity (horizontal and vertical)
  - specific storage
  - specific yield
- Channel Properties:
  - hydraulic conductivity of channel beds
  - channel geometry, slope, and roughness of channels
- Vegetation Related Parameters:
  - root profiles of riparian vegetation
  - soil capillary fringe depth
  - on-farm irrigation efficiency
  - fractional distribution crop consumptive use between evaporation and transpiration

The RMBHM spatial domain—including the model's spatial extent, spatial discretization, hydrogeologic framework, and surface channel network—is

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<sup>7</sup> Seasonally-varying inputs vary between irrigation and non-irrigation stress periods, but do not vary between years; for example, a seasonally varying input has a single value for all irrigation stress periods and a single value for all non-irrigation stress periods, but may differ between irrigation and non-irrigation stress periods.

identical to the spatial domain used in previous model versions (SSPA 2007, Hanson et al. 2013). Similarly, the initial parameter set for RMBHM was adopted directly from Hanson et al. (2013). Initial parameter values for subsurface properties were developed by SSPA (2007) and adopted by Hanson et al. (2013). Parameter values were developed through a combination of manual (trial-and-error) calibration and parameter estimation simulations using PEST, a model-independent parameter optimization software (Watermark Numerical Computing 2005); calibration was carried out with respect to observed historical groundwater heads at monitoring well locations throughout the model domain and drain flows at selected Project drains where sufficient data were available (SSPA 2007). Initial parameters defining channel properties were developed by Hanson et al. (2013) based on further sensitivity analysis with respect to observed historical surface water flows.

The initial parameters set adopted from Hanson et al. (2013) was evaluated by simulating Project operations under historical hydrology, climate, and cropping conditions for the period 1960-2009 and comparing simulation results to observed historical conditions during this period. For evaluation purposes, historical Project operations were represented by implementing a consistent set of Project allocation and accounting procedures representative of historical operations for the period 1990-2006. Historical hydrology and climate conditions were represented through time-varying model inputs, including historical inflows to Elephant Butte Reservoir, historical reservoir precipitation and evaporation rates, and crop irrigation requirement computed based on historical meteorology, crop distribution, and irrigated acreage data. RMBHM uses a fixed set of operating rules representative of Project allocation and accounting practices during this period, whereas actual operations during the evaluation period varied from year to year; simulated operations are therefore not expected to match historical measurements perfectly.

Model results were compared to historical records of Project storage, releases, diversions, and flow in the Rio Grande below Caballo Dam and at El Paso, and to previous estimates of Project surface-water deliveries and groundwater deliveries for supplemental irrigation for Project service areas in the Rincon and Mesilla Valleys. The model evaluation and sensitivity analysis conducted with RMBHM did not re-evaluate simulated groundwater heads and drain flows. Model results using the initial parameter set adopted from Hanson et al. (2013) exhibit surface-water releases and diversions consistent with historical observations; however simulated surface-water deliveries were higher than historical observations and simulated groundwater deliveries were lower than previous historical estimates. Results suggest that the initial parameter set overestimates conveyance efficiency of Project canals and laterals, resulting in underestimated groundwater pumping for supplemental irrigation.

In response to these evaluation results, a limited sensitivity analysis was carried out to assess model sensitivity to selected parameters and to identify a preferred parameter set for simulations conducted in support of the EIS. A large number of

simulations were carried out with varying parameter values for selected parameters, including subsurface and channel bed hydraulic conductivities, aquifer specific storage and specific yield, capillary fringe depth, and on-farm irrigation efficiency. Sensitivity results revealed that simulated Project storage, allocations, releases, and diversions are weakly sensitive (less than 10% change) to all model parameters. Simulated surface-water and groundwater deliveries to irrigated lands in Rincon and Mesilla Valleys were found to be moderately sensitive (between 10% and 20% change) to changes in the hydraulic conductivity of canal beds, which affects canal seepage losses; capillary fringe depth, which affects direct uptake of groundwater by crops; and on-farm irrigation efficiency, which affects the total delivery requirement to farms.

A preferred parameter set was selected based on comparison of historical and simulated Project storage, releases, diversions, and surface-water deliveries. With the selected parameter set, Project operations simulated by RMBHM closely match historical Project records. As illustrated in Figure 2, simulated total Project storage is well correlated with observed historical storage ( $R^2 = 0.94$ ) and exhibits little systematic bias. Similarly, Figure 3 shows that simulated annual releases from Caballo Dam also agree well with observed historical releases. The simulated average annual Project release is within one percent of the historical average, and the simulated average annual total Project diversion from the Rio Grande is within 5% of the historical average. Simulated surface-water and groundwater deliveries to irrigated lands in the Rincon and Mesilla valleys also agree well with previous estimates developed by NMOSE (SSPA 2007).

Strong agreement of RMBHM with historical records suggests that RMBHM captures the key operational and hydrologic factors that drive surface-water and groundwater management and use in the Rincon and Mesilla Basins. Discrepancies between simulated and observed Project operations likely reflect uncertainties in the historical data used to develop model inputs, including historical records of inflows to Elephant Butte Reservoir, meteorological conditions throughout the study area, and cropping patterns, irrigated acreage, and on-farm irrigation efficiencies in the Rincon and Mesilla valleys. Simplifications required to simulate Project operations also contribute to discrepancies between simulated and observed conditions. Key simplifications include the spatial and temporal discretization of RMBHM and the use of a consistent set of operation procedures throughout the simulation, in contrast to actual operating procedures which evolved over time, especially between 1980 and 2008. Key simplifications and assumptions are discussed in Section 6.5.

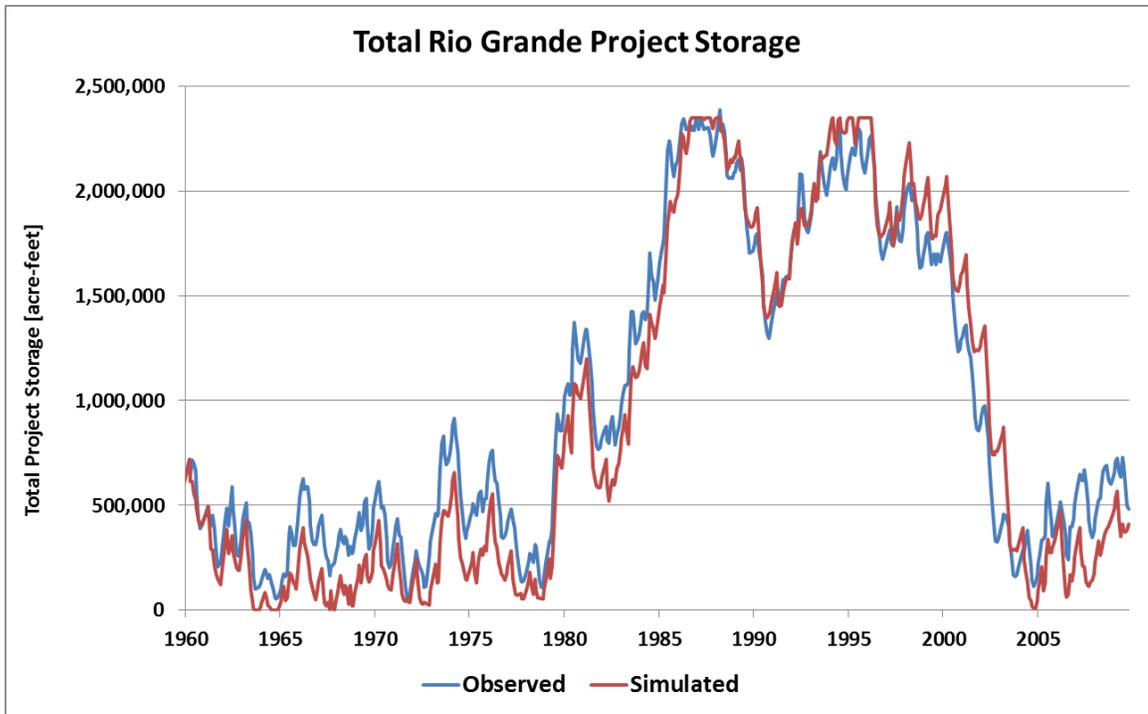


Figure 2: Observed and simulated monthly total Rio Grande Project storage in Elephant Butte and Caballo Reservoirs (acre-feet) for the period 1960-2010.

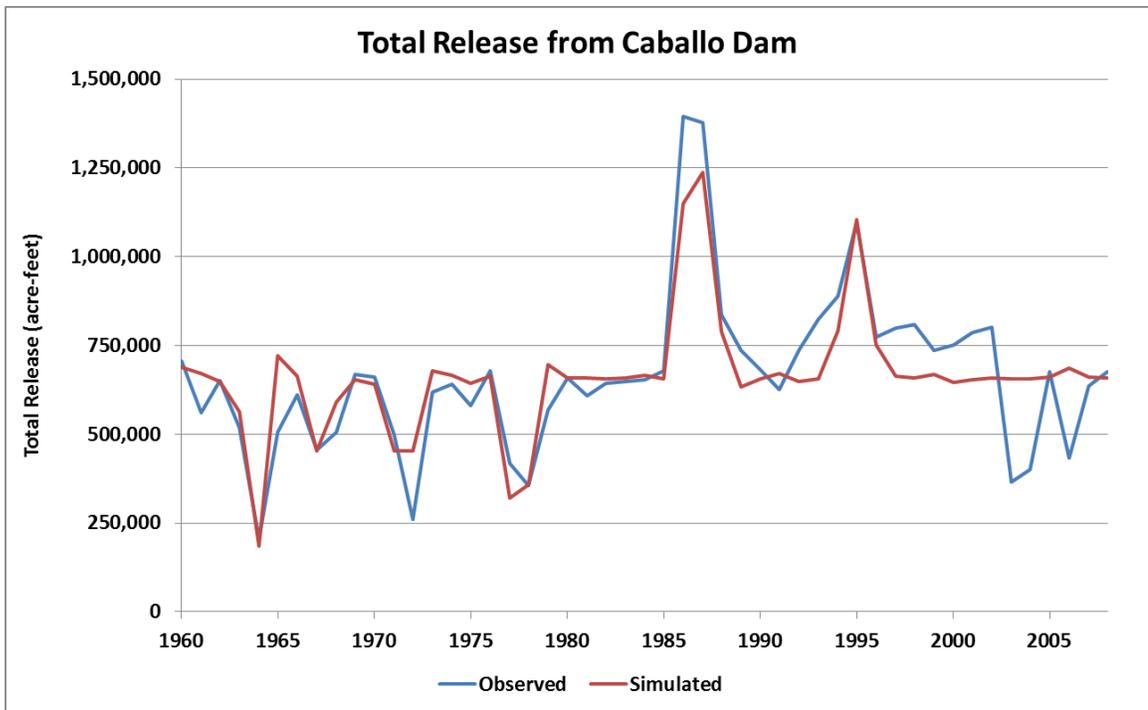


Figure 3: Observed and simulated annual release from Caballo Dam (acre-feet) for the period 1960-2010.

## 6.4 Time-Varying Model Inputs

In order to simulate transient conditions over the simulation period (November 2007 – October 2050), RMBHM requires time-varying inputs representing projected hydrologic, climatic, and anthropogenic stresses to the surface-water and groundwater systems of the Rincon and Mesilla Basins over this period. Hydrologic stresses represented in RMBHM include surface-water inflows to Project storage; climatic stresses include reservoir precipitation and evaporation rates and reference evapotranspiration in the Rincon and Mesilla Valleys; and anthropogenic stresses include cropping patterns, irrigated acreage, and on-farm irrigation efficiency of agricultural lands, municipal and domestic groundwater pumping rates and locations, and discharge of treated effluent from municipal wastewater treatment facilities. In addition, the storage and relinquishment of Rio Grande Compact credit waters in Elephant Butte Reservoir is represented as a time-varying input.

Hydrology and climate inputs to RMBHM for simulations carried out in support of the EIS are based on a combination of recent historical conditions and projections of future conditions, including projected effects of climate change. Projected future inflows to Elephant Butte Reservoir, reservoir precipitation and evaporation rates, and precipitation and temperature conditions in Rincon and Mesilla Valleys were obtained from previous analyses carried out by Reclamation and others as part of the West Wide Climate Risk Assessment (WWCRA; Reclamation 2011a, Reclamation 2011b) and Upper Rio Grande Impact Assessment (URGIA; Reclamation 2011a, Reclamation 2013).

Projections of future climate and hydrologic conditions were developed through a multi-phase modeling approach (Reclamation 2013). The three primary modeling phases are summarized below:

- Downscale temperature and precipitation projections from global climate models to a spatial scale relevant for regional analysis.
- Perform hydrologic modeling to develop projections of future streamflow at selected locations within the Rio Grande Basin.
- Use the downscaled projections of temperature, precipitation, and streamflow as inputs to a local monthly operations model, the Upper Rio Grande Simulation Model (URGSiM; see Reclamation 2013, Appendix E), to simulate future operations of Reclamation projects and related Federal and non-Federal activities and infrastructure in the basin under projected future climate and hydrologic conditions.

Climate and hydrologic projections used here are based on an ensemble of 112 projections of 21<sup>st</sup> century climate developed and archived as part of the World Climate Research Programme (WCRP) Coupled Model Inter-comparison Project Phase 3 (CMIP3) (Meehl et al. 2007) and Intergovernmental Panel on Climate

Change (IPCC) Fourth Assessment Report (IPCC 2007). The CMIP3 ensemble includes projections from 16 global climate models (GCMs; also referred to as general circulation models) and representing a variety of initial conditions of global ocean-atmosphere system and future scenarios regarding the evolution of atmospheric greenhouse gas concentrations over the 21<sup>st</sup> century (see Meehl et al. 2007, IPCC 2000, and IPCC 2007 for details).

Reclamation, in cooperation with Lawrence Livermore National Laboratory, Santa Clara University, Climate Central, and the Institute for Climate Change and its Societal Impacts, performed Bias Correction and Spatial Disaggregation (BCSD) of the 112 projections of future temperature and precipitation using the statistical technique of Wood et al (2004). The resulting BCSD dataset includes 112 projections of monthly temperature and precipitation over the continental United States at 1/8 degree spatial resolution (12 km) for the period from 1950 through 2099 (see Reclamation 2011a for details). Reclamation then used the BCSD precipitation and temperature projections as input to the Variable Infiltration Capacity (VIC) hydrology model (Liang et al. 1994, Liang et al. 1996, and Nijssen et al. 1997) to develop projections of future hydrologic conditions over the western United States, including simulated natural streamflow variability for the period 1950-2099 (see Reclamation 2011a for details). Projected streamflow at selected locations within the Rio Grande basins were then bias corrected<sup>8</sup> to remove systematic biases between simulated and observed streamflow and to ensure that projected flows are consistent with long-term statistics of observed streamflow in the basin (see Reclamation 2013, Appendix D, for details).

Finally, projections of future water operations in the Upper Rio Grande Basin were developed using the URGSiM (Reclamation 2013, Appendix E), including reservoir storage and releases, groundwater/surface-water interactions, municipal and agricultural water deliveries, and agricultural and riparian consumptive use. URGSiM simulates water operations from the San Luis Valley in southern Colorado to Caballo Reservoir in southern New Mexico based on specified operating rules and time-varying inputs of monthly streamflow, precipitation, and maximum and minimum temperatures. URGSiM simulates storage, releases, flows, and deliveries on the Rio Grande mainstem, the Rio Chama and Jemez River tributary systems, and the Española, Albuquerque, and Socorro regional groundwater basins, including:

- Operations of nine dams
- Interbasin transfers from the Colorado River Basin to the Rio Grande Basin (via Reclamation's San Juan-Chama project)

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<sup>8</sup> Bias correction was carried out using the quantile-mapping bias correction technique detailed in Wood et al. 2004.

- Agricultural diversions and depletions in the Chama, Española, and Middle Rio Grande Valleys (most of which occur via irrigation infrastructure originally built by Reclamation as part of the Middle Rio Grande Project)
- Evapotranspiration (ET) i.e., the evaporation plus water use by riparian plants and crops

For the purposes of the EIS, projected inflows, Rio Grande Compact credit water, and evaporation and precipitation rates for Elephant Butte Reservoir were obtained from URGSiM results for the URGIA “Base Case” operating scenario. The Base Case operating scenario represents changes in water supply, demand, and operations resulting directly from projected changes in the climate, assuming no change in infrastructure, operations, population, irrigated acreage and cropping patterns, and other non-climate-related parameters. In addition, Base Case operating scenario assumes that Colorado and New Mexico meet their respective surface-water delivery requirements under the Rio Grande Compact. Water shortages in each state are managed by decreasing water use in the San Luis valley in Colorado and the Middle Rio Grande Valley in New Mexico, respectively, so that accumulated debits do not exceed 100,000 AF. Compact credits are allowed to accumulate, but are relinquished to Texas when credits exceed 70,000 AF. A total of 112 Base Case simulations were conducted as part of URGIA, corresponding to the suite of 112 BCSD climate projections.

Three of the 112 Base Case simulations were selected as inputs to RMBHM to represent the range of projected future hydrologic conditions in the basin. Simulations were selected based on projected future surface-water availability as characterized by projected average annual inflow to Elephant Butte Reservoir over the EIS simulation period (2007-2050). Selected simulations represent a drier scenario corresponding to the URGSiM simulation with the 25<sup>th</sup> percentile average annual inflow (Scenario P25), a central tendency scenario corresponding to the simulation with the 50<sup>th</sup> percentile (median) annual inflow (Scenario P50), and a wetter scenario corresponding to the simulation with the 75<sup>th</sup> percentile inflow (Scenario P75) relative to the ensemble of 112 simulations. Average annual inflows to Elephant Butte Reservoir are illustrated in Figure 4 for observed historical conditions (average over period 1950-2010) and for each of the three selected climate scenarios (average over period 2007-2050).

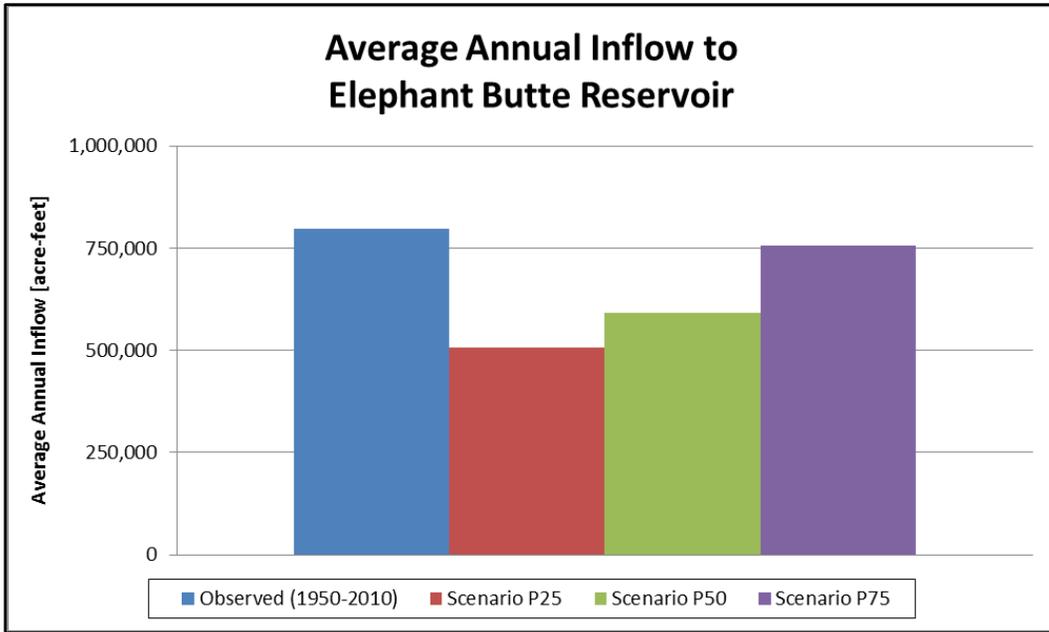
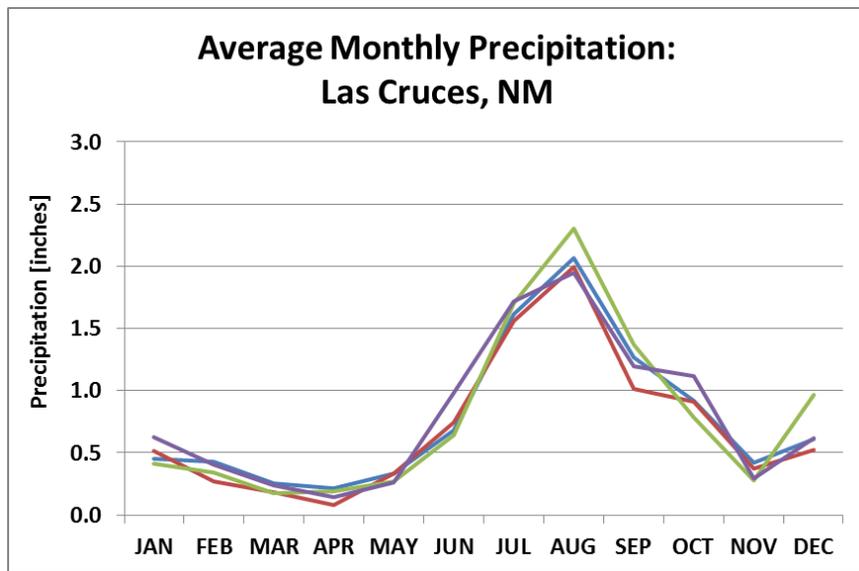
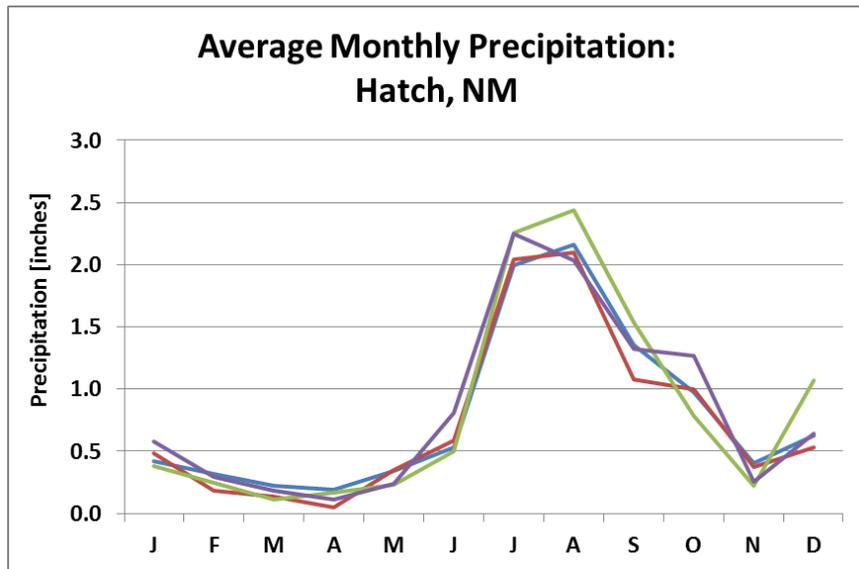


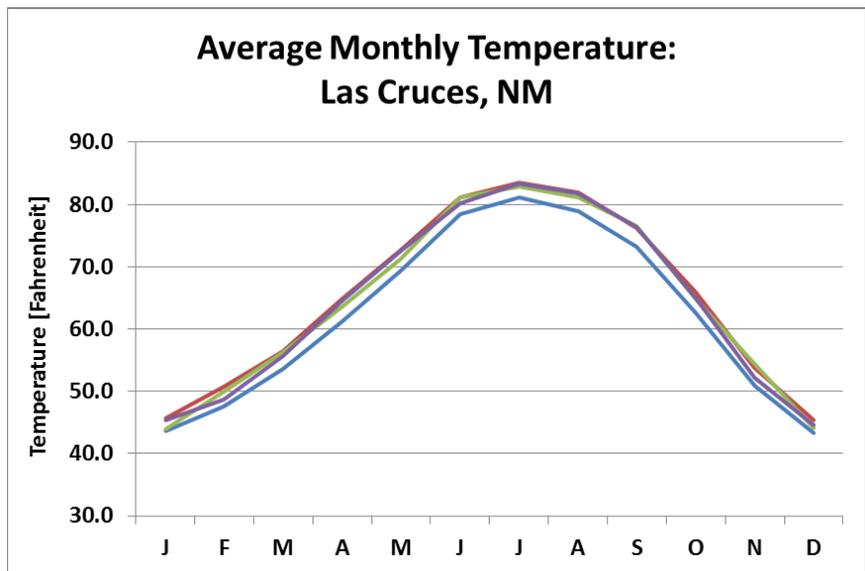
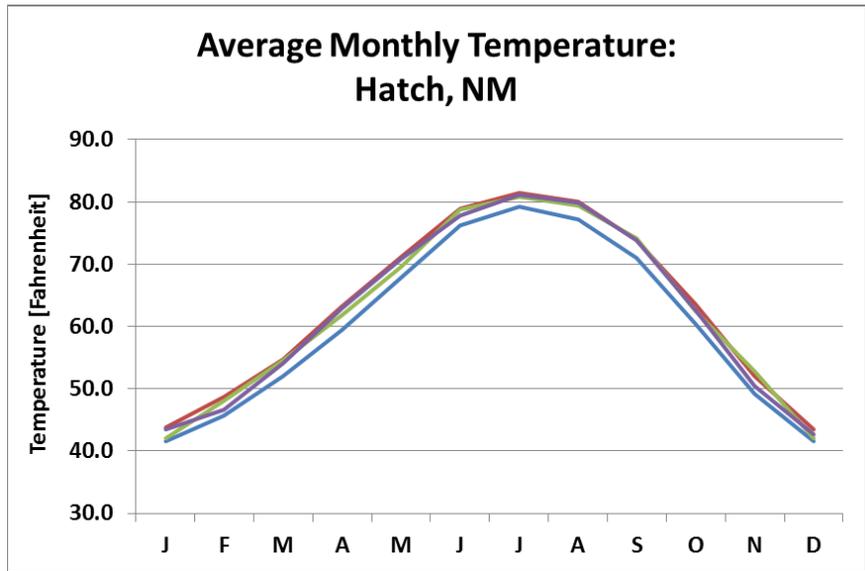
Figure 4: Observed historical average annual inflow to Elephant Butte Reservoir during the period 1950-2010 (acre-feet) and projected future average annual inflow to Elephant Butte Reservoir during the simulation period (2007-2050) for the climate scenarios considered in support of the Rio Grande Project Operating Agreement EIS.

For each scenario, time-varying climate and hydrologic inputs were developed from URGSiM results and corresponding BCSD climate projections. RMBHM inputs of monthly inflows to Elephant Butte Reservoir, monthly reservoir precipitation and evaporation rates, and monthly Rio Grande Compact credit water in Elephant Butte Reservoir over the simulation period were adopted directly from URGSiM model outputs. Seasonal crop irrigation requirement (CIR) inputs to RMBHM for each Rio Grande Project service area in the Rincon and Mesilla valleys were developed by adjusting calculated historical crop evapotranspiration for a selected base year according to the projected change in reference evapotranspiration (reference ET) between the base and future years. Projected future reference ET was calculated using the Hargreaves-Samani method (Hargreaves and Samani 1985) based on projected future temperatures from the BCSD climate projections corresponding to the selected URGSiM simulations. Seasonal CIR was then calculated by subtracting effective precipitation during the irrigation season from calculated crop evapotranspiration, with precipitation taken from the corresponding BCSD climate projections and effective precipitation calculated using the USDA Soil Conservation Service method (Dastane 1978). Monthly average precipitation, temperature, and reference ET at weather stations in Hatch, NM and Las Cruces, NM are illustrated in Figures 5-7, respectively, for observed historical conditions (average over period 1950-2010) and for each of the three selected climate scenarios (average over period 2007-2050).



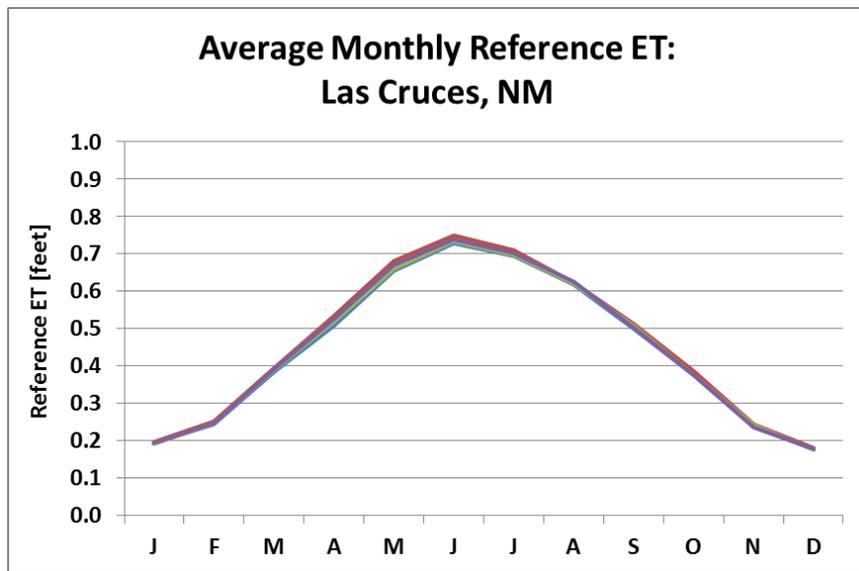
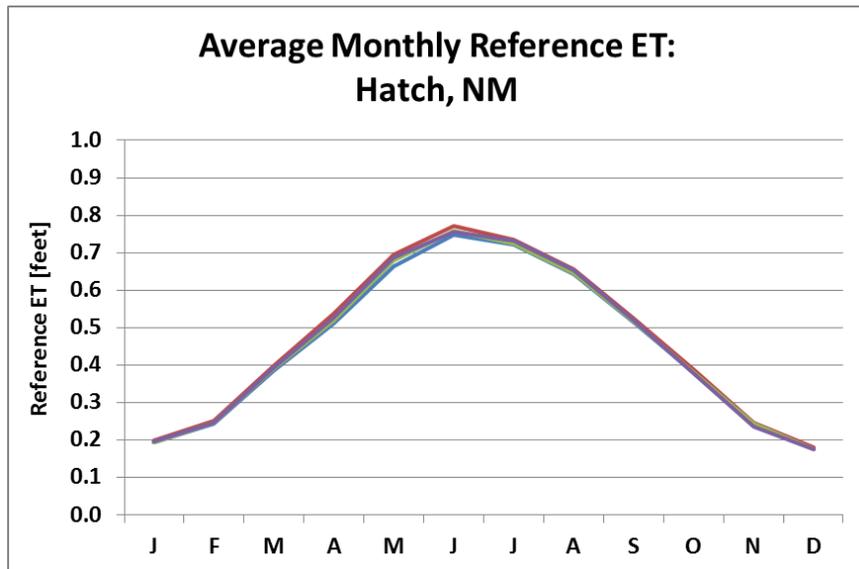
— Observed (1950-2010) — Scenario P25 — Scenario P50 — Scenario P75

Figure 5: Observed historical average monthly precipitation at Hatch, NM and Las Cruces, NM during the period 1950-2010 (inches) and projected future historical average monthly precipitation during the simulation period (2007-2050) for climate scenarios considered in support of the Rio Grande Project Operating Agreement EIS.



— Observed (1950-2010) — Scenario P25 — Scenario P50 — Scenario P75

Figure 6: Observed historical average monthly mean temperature at Hatch, NM and Las Cruces, NM during the period 1950-2010 (inches) and projected future historical average monthly precipitation during the simulation period (2007-2050) for climate scenarios considered in support of the Rio Grande Project Operating Agreement EIS.



— Observed (1950-2010) — Scenario P25 — Scenario P50 — Scenario P75

Figure 7: Observed historical average monthly mean temperature at Hatch, NM and Las Cruces, NM during the period 1950-2010 (inches) and projected future historical average monthly precipitation during the simulation period (2007-2050) for climate scenarios considered in support of the Rio Grande Project Operating Agreement EIS.

## 6.5 Model Assumptions

Simulation of future Project operations and corresponding surface-water and groundwater conditions in the Rincon and Mesilla Basins requires several assumptions regarding future conditions, including future climate and hydrology, cropping and irrigation practices, and non-agricultural water uses. Additional assumptions are required to approximate day-to-day operational decisions by Reclamation, EBID, EPCWID, and individual irrigators that are not specified in the OA or Operations Manual. Important assumptions used to represent Project operations in RMBHM are briefly summarized below.

- *Irrigation Water Demands in Rincon and Mesilla Valleys*

As described above, time-varying (seasonal) crop irrigation requirement for irrigated lands within the Rincon and Mesilla Basins is a required model input. In order to develop projections of future crop irrigation requirement for the model simulation period, it was necessary to make assumptions regarding future cropping patterns, irrigated acreage, and irrigation response to surface-water deficiencies.

The cropping pattern for each service area within the model domain was based on cropping data available for the year 2000. Crop evapotranspiration was first calculated for each canal service area for the year-2000 irrigation season, based on previous analysis conducted by NMOSE. Projected seasonal reference evapotranspiration was then calculated for each year in the model simulation period, and projected crop evapotranspiration over the simulation period was calculated by adjusting the year-2000 crop evapotranspiration in accordance with projected variations in annual reference evapotranspiration. Crop irrigation requirement was then calculated by subtracting effective precipitation during the irrigation season from calculated crop evapotranspiration. This approach assumes constant cropping pattern, acreage, and crop coefficients over the simulation period, with variations in crop evapotranspiration driven only by to variations in reference evapotranspiration.

The distribution of irrigated lands within the model domain is based on geospatial data available for the year 2000 and was held constant over the simulation period. This approach assumes that irrigated lands remain in production for the duration of the simulation and therefore are independent of Project surface-water supply.

For simulations performed in support of the EIS, it is assumed that all irrigated lands have physically and legally unrestricted access to sufficient supplemental groundwater to fully meet the consumptive irrigation requirement on the land, and therefore that crop irrigation requirement is fully met throughout the simulation period. This approach allows the model to compute groundwater pumping for irrigation as the difference between

the total farm delivery required to meet the crop irrigation requirement and the actual quantity of Project surface-water delivered to farms. The assumption that crop irrigation requirement is fully met throughout the simulation period is consistent with assumptions used in previous analyses (SSPA 2007, Hanson et al. 2013). This assumption may over-estimate groundwater deliveries in cases where actual well locations and capacities limit actual groundwater use.

- *Non-Irrigation Water Demands in Rincon and Mesilla Valleys*

Non-irrigation water uses in Rincon and Mesilla Valleys include municipal, industrial, and domestic uses by the City of El Paso, City of Las Cruces, the Santa Teresa development, several smaller mutual domestic associations and local water agencies, and individual domestic water users. Non-irrigation water demands in the Rincon and Mesilla Valleys are met exclusively from groundwater. In order to develop projections of future groundwater withdrawals for non-irrigation purposes over the model simulation period, it was necessary to make assumptions regarding the location and quantity of groundwater extracted for municipal, industrial, and domestic uses.

For simulations performed in support of the EIS, it is assumed that the location and quantity of groundwater pumping for non-irrigation uses over the simulation period will be consistent with historical uses over the period 1995-2004. Time-varying model inputs for non-irrigation groundwater pumping were developed based on model inputs for the period 1995-2004 in a previous model version developed by NMOSE (SSPA 2007). Locations of non-irrigation wells were adopted directly from the previous model version, and the seasonal pumping rate for each non-irrigation well was set equal to the well's average seasonal pumping rate during the period 1995-2004 for irrigation and non-irrigation seasons, respectively. Seasonal non-irrigation pumping rates were held constant over the simulation period. This assumption implies that any population and economic growth during the simulation period will be accompanied by reductions in per capita water demand such that total non-irrigation demands remain constant at average 1995-2004 levels.

- *Non-Project Releases from Elephant Butte Reservoir.*

Releases of non-Project water from Project storage are limited to the direct release from Caballo Dam to Bonita Private Lateral and reservoir spills under flood conditions. Non-Project releases to Bonita Private Lateral serve irrigation demands in the northern Rincon Valley between Caballo Dam and Percha Dam. RMBHM does not simulate demand-driven non-Project releases; rather, non-Project releases are represented as a time-varying input. For simulations performed in support of the EIS, it is assumed that non-Project releases are constant for each season over the model simulation

period. Non-Project releases during the irrigation season were approximated based on the average annual non-Project release during recent years (2001 through 2010); non-Project releases during this period are consistent with the long-term average non-Project releases over the period 1950-2010. Consistent with recent historical records, non-Project releases during the non-irrigation season are assumed to be zero.

- *Project Water Demands in El Paso Valley*

Project water demands in El Paso Valley are not explicitly simulated in RMBHM. In order to represent Project diversions at American Dam to American Canal, a diversion demand was specified at the heading of American Canal. RMBHM then simulates Project diversions to American Canal based on the specified diversion demand and the simulated diversion allocation available to EPCWID; water diverted to American Canal is subsequently routed out of the model domain. This approach allows RMBHM to simulate Project diversions to American Canal without explicitly simulating water demands and routing of Project surface water to delivery points for use in El Paso Valley, which lies outside of the model spatial domain.

For simulations performed in support of the EIS, it is assumed that Project demands in the El Paso Valley portion of EPCWID can be adequately represented as a diversion demand at the American Canal heading, as opposed to end-user demands at points of delivery (e.g., farm or municipal delivery requirement). In addition, it was assumed that future diversion demands over the simulation period will be consistent with recent diversions in years when Project allocation to EPCWID was equal to or greater than the district's historical full allocation of 376,842 acre-feet under prior operating practices. The EPCWID diversion demand for American Canal was therefore calculated based on historical gross diversions to American Canal for the years 2007-2010. The diversion demand for American Canal was specified as constant for all irrigation seasons over the simulation period.

The diversion demand used here represents the expected maximum diversion to American Canal under full-supply conditions. It should be noted that simulated actual diversions to American Canal are curtailed (reduced) when the simulated diversion allocation available to EPCWID is less than full. Simulated diversions are constrained such that for each year, the sum of diversion charges and credits to EPCWID are less than or equal to the district's total diversion allocation for that year.

- *Project Water Demands for Delivery to Mexico*

Project water demands in Mexico are not explicitly simulated in RMBHM. In order to represent Project deliveries to the heading of the Acequia Madre for diversion to Mexico, a diversion demand was specified at the downstream-most segment of the Rio Grande represented on the model domain, located at Paso del Norte, approximately 1.5 miles upstream of International Dam. RMBHM then simulates Project deliveries to Mexico based on the specified diversion demand and the simulated diversion allocation available to Mexico; water delivered to Paso del Norte for diversion to Mexico is subsequently routed out of the model domain.

For simulations performed in support of the EIS, it is assumed that Project deliveries to the heading of the Acequia Madre are always equal to the annual Project allocation to Mexico, where the annual allocation to Mexico is calculated based on the D1 Curve as described above in Section 4. In the event of a discrepancy between diversion allocation and actual water available for diversion, delivery to Mexico takes priority over diversions to serve Project lands in the United States. This assumption is consistent with historical operations and ensures that Project obligations to deliver water to the heading of the Acequia Madre according to the 1906 Convention are satisfied.

- *Project Water Accounting for Diversions in Rincon and Mesilla Valleys*

As summarized in Section 6.2, the surface water network in the Rincon and Mesilla valleys is represented in RMBHM as a network of discrete segments and reaches. Larger channels are represented explicitly in the model, whereas smaller channels are not represented explicitly. As a result, several smaller Project diversions in the Rincon and Mesilla valleys are not explicitly represented in the simulated Project accounting. These smaller diversions include the Del Rio Lateral, which receives water at Mesilla Diversion Dam, and pumping of surface water directly from the Rio Grande at several locations. These smaller diversions and the corresponding accounting charges are lumped with the major diversions represented explicitly in the model (Percha Lateral, Arrey Canal, Leasburg Canal, Eastside Canal, Westside Canal, American Canal, and Acequia Madre).

- *Project Water Accounting for Diversions to El Paso Valley*

Project water accounting involves the calculation of charges and credits to the Project allocation balances of EBID, EPCWID, and Mexico representing each entity's use of Project surface-water supplies. Allocation charges represent the amount of Project water diverted from the Rio Grande and thus not available for downstream diversion, and allocation credits represent the amount of water returned to the Rio Grande that contributes to the supply available for downstream diversions (see Section 4).

Actual charges and credits to EPCWID's Project allocation balance for water delivered to El Paso Valley are based on water orders and deliveries at four locations served by American Canal: the intakes to the Umbenhaurer-Robertson and Jonathon W. Rogers water treatment facilities and the headings of Riverside and Franklin Canals. RMBHM specifies a diversion demand at American Canal and simulates diversion of Project water at American Dam to the heading of American Canal; however, routing and delivery of Project water to accounting points in El Paso Valley is not explicitly represented (see previous assumption regarding water demands for El Paso Valley).

In order to represent allocation charges and credits to EPCWID for Project water diverted to El Paso Valley, RMBHM approximates allocation charges and credits by multiplying simulated gross diversions to American Canal by a constant charge factor and credit factor, respectively. Charge and credit factors are specified as inputs to RMBHM. The charge factor represents the charge in acre-feet against EPCWID's water allotment balance per acre-foot of water diverted at the heading of the American Canal. Similarly, the credit factor represents the credit, in acre-feet, to EPCWID's water account per acre-foot of water diverted. The use of charge and credit factors allows RMBHM to represent charges and credits to EPCWID for water diverted to El Paso Valley without explicitly routing water to the four delivery locations listed above.

For simulations performed in support of the EIS, charge and credit factors were calculated based on records of gross diversions and charges to EPCWID in El Paso Valley during recent years when the Project diversion allocation to EPCWID was greater than or equal to the district's historical full allocation of 376,842 AF under prior operating practices (2007-2010). The charge factor was calculated as the ratio of total annual Project charges to EPCWID for El Paso Valley divided by the annual gross diversion at American Canal, averaged over the period 2007-2010. Similarly, a credit factor was calculated as the ratio of total annual credits to EPCWID for El Paso Valley divided by the annual gross diversion at American Canal, averaged over the same period. Based on recent Project records, a charge factor of 0.908 and credit factor of 0.086 were used for simulations performed to support the EIS.

- *Surface Water Inflows below Caballo Dam*

Surface water inflows to the Rio Grande within the RMBHM model domain—i.e., between Caballo Dam and Paso del Norte—include storm runoff and treated effluent from wastewater treatment facilities. Storm runoff originates primarily in the mountains bordering the Rincon and Mesilla valleys and reaching the valleys via ephemeral arroyos, with minor contributions from local runoff within the valleys. Neither comprehensive records nor estimates of storm runoff exist within the RMBHM model

domain; however, previous studies suggest that storm runoff accounts for a small fraction of the total water entering the basins (Conover 1954, SSPA 2007). Given the lack of available data, storm runoff is neglected in RMBHM.

Records of treated effluent returned to the river system are available for Las Cruces, NM and Anthony, TX. Previous modeling efforts represented treated effluent as a time-varying inflow to the Rio Grande, with seasonal effluent rates based on historical records (SSPA 2007). For simulations performed to support the EIS, the rate of effluent discharge to the Rio Grande was assumed to be constant over the simulation period (2007-2050), with effluent rates calculated as the average rate over the period 1995-2004. This assumption implies that effluent reaching the Rio Grande will not be affected by potential population and economic growth during the simulation period.

- *Calculation of San Juan-Chama Project Water in Elephant Butte Reservoir*

The quantity of SJC Project water in Elephant Butte Reservoir is calculated using a spreadsheet post-processing tool. Input to the post-processing tool includes Project storage in Elephant Butte and Caballo reservoirs simulated by RMBHM, as well as Rio Grande Compact credit water and area-capacity-elevation tables for Elephant Butte and Caballo reservoirs used as input to RMBHM. The post-processing tool uses these inputs to compute the amount of SJC Project water in Elephant Butte, which is calculated as the lesser of the available storage (reservoir capacity minus reservoir storage at each time step) and 50,000 AF.

This post-processing approach is based on two assumptions. First, Rio Grande Project water and Rio Grande Compact credit water in Elephant Butte are not affected by storage of SJC Project water. As a result, the amount of SJC Project water in Elephant Butte Reservoir is limited to the lesser of the contractual storage volume (50,000 acre-feet) and the available storage in Elephant Butte Reservoir. This approach implies that Project water is not released from Elephant Butte to allow for additional storage of SJC Project water in Elephant Butte, even if additional storage is available in Caballo Reservoir. Similarly, this approach implies that Rio Grande Compact credit water is not relinquished or released to allow for storage of SJC Project water.

Second, this post-processing approach assumes that SJC Project contractors will fully utilize their contractually available storage. Analysis of San Juan-Chama Project operations and availability of SJC Project water for storage in Elephant Butte Reservoir is beyond the scope of the modeling and analysis described here. It is therefore assumed that SJC Project contractors will fully utilize the contractually available storage.

- *Consistent Representation of Project Operating Procedures over Simulation Period*

Historically, Project operating procedures have been modified and improved over time to reflect changes in operating priorities and responsibilities between Reclamation, EBID, and EPCWID, and to respond to changes in hydrologic, climatic, and regulatory conditions affecting the Project. The OA allows for modification of the operating procedures defined in the OA and corresponding Operations Manual, provided that all parties to the OA agree to the modifications.

It is not possible to anticipate future modifications to Project operating procedures that may occur during the remaining term of the OA through December 31, 2050. For simulations performed in support of the EIS, it was therefore assumed that operating procedures would remain consistent over the full simulation period.

## 7 Summary of Model Output

RMBHM was used to simulate each of five EIS alternatives (see Section 5) under each of three selected projections of future climate and hydrologic conditions (see Section 6.4). Formatted model outputs for selected hydrologic and operational parameters are provided as Appendix A of this technical memorandum; complete model files and unformatted model outputs are provided as Appendix B.

Model outputs are provided to support analysis of the potential effects of alternative Project operating procedures and SJC Project storage contracts on Project operations and surface-water and groundwater resources in the Rincon and Mesilla Basins as part of the EIS. A brief summary of key findings from the model simulations performed in support of the EIS is provided below. Detailed analysis of model results will be performed as part of the EIS and is beyond the scope of this memorandum.

- (1) Project Storage: For each climate scenario, the rate and timing of simulated fluctuations in total storage and Project storage in Elephant Butte and Caballo reservoirs are qualitatively similar across all EIS alternatives. Results suggest that EIS alternatives are not likely to have a strong effect on Project storage or total annual Project releases.
- (2) Project Diversions and Deliveries: Project diversions and deliveries to EBID vary between EIS alternatives; by contrast, diversions and deliveries to EPCWID exhibit little sensitivity to alternative allocation and accounting procedures. Differences in Project diversions and deliveries to EBID between EIS alternatives are consistent with the diversion ratio provision of the OA, which maintains the annual Project diversion

allocation to EPCWID based on the D-2 Curve and adjusts the annual Project diversion allocation to EBID to account for changes in Project performance (see Section 4). Results suggest that EIS alternatives are likely to affect the magnitude of surface water depletions due to groundwater pumping in the Rincon and Mesilla Valleys, annual Project performance, the quantity of surface water diversions to EBID, and the distribution of Project diversions between EBID and EPCWID.

- (3) Total Farm Deliveries (Surface Water + Groundwater): As discussed in Sections 6.2 and 6.5, simulations carried out in support of the EIS assume that crop irrigation requirements are met in full: irrigation requirement that is not satisfied by Project surface-water deliveries is met through supplemental groundwater deliveries. Groundwater deliveries to irrigated lands represent supplemental groundwater pumping by individual farmers, as authorized by the States; groundwater pumping is neither performed nor authorized by the Federal project, and the model does not represent groundwater pumping by either irrigation district. Combined total delivery of Project surface-water and supplemental groundwater to Project lands in Rincon and Mesilla Valleys is, therefore, nearly identical under all alternatives. However, since the deliveries of Project surface-water vary between alternatives, the portion of total deliveries and consumptive use met by Project surface-water varies accordingly. Results suggest that the proposed alternatives do not affect the total delivery and consumptive use within EBID and the portion of EPCWID in the Mesilla Valley, but do affect the portion of deliveries and consumptive use met by Project surface-water.
- (4) Groundwater Levels and Project Performance: Groundwater levels in the Rincon and Mesilla Basins exhibit seasonal declines (drawdown) during the irrigation season and multi-year declines during sustained dry periods under all alternatives, with corresponding seasonal recovery during the non-irrigation season and multi-year recovery during sustained wet periods. Project performance, as represented by the annual diversion ratio, exhibits similar multi-year behavior, with declines during sustained dry spells and recovery during sustained wet spells. Declines in groundwater levels and Project performance are greatest under alternatives that include the diversion ratio adjustment provision of the OA (Alternatives 1, 2, and 3). However, groundwater levels and Project performance recover to approximately the same level during sustained wet spells under all alternatives. Results suggest that the diversion ratio adjustment provision of the OA may result in increased declines in groundwater levels and Project performance during sustained dry periods, but that these effects are temporary and do not result in permanent effects on groundwater resources or Project performance.
- (5) Climate Uncertainties: For each EIS alternative, Project storage, releases, diversions, and deliveries vary substantially between the three climate

scenarios. In addition, relative differences in storage, releases, diversions, and deliveries between alternatives also vary between climate scenarios. Results suggest that uncertainties in future Project operations resulting from uncertainties in future climate and hydrologic conditions are substantially larger than the estimated effects of proposed allocation and accounting alternatives.

To support further analysis for the EIS, formatted simulation results for key operational and hydrologic parameters are provided in graphical and tabular form as a digital appendix to this memorandum; operational and hydrologic parameters included in the attached simulation results are briefly described below and are listed in detail in Table 2 (below). All data provided in the digital appendix are RMBHM model output for the operating alternatives and climate scenarios described herein; corresponding historical records for the parameters listed below and in Table 2 are not provided here.

- *Reservoir Storage, Elevation, and Area:*  
Monthly storage in Elephant Butte and Caballo reservoirs, including storage of Project water, Rio Grande Compact credit water, and SJC Project water. Monthly reservoir surface elevation and area for Elephant Butte Reservoir, computed from monthly total storage using the current area-capacity-elevation tables for Elephant Butte Reservoir.
- *Releases:*  
Annual release from Caballo Dam, including releases for Project diversions, spills, and non-Project deliveries to Bonita Private Lateral.
- *Project Diversions:*  
Annual Project surface-water diversions from the Rio Grande, including gross diversions at each Project canal heading and net diversions to each canal service area. Project canal headings include Percha Lateral, Arrey Canal, Leasburg Canal, Eastside Canal, Westside Canal, American Canal, and Acequia Madre. Canal service areas include Percha Lateral, Arrey Canal, Leasburg Canal, Eastside Canal in New Mexico, Westside Canal in New Mexico, Eastside Canal in Texas, Westside Canal in Texas, American Canal, and Acequia Madre
- *Project Deliveries:*  
Annual Project surface-water deliveries to Project lands in EBID and to Project lands in the Mesilla Valley portion of EPCWID.
- *Groundwater Deliveries:*  
Annual Supplemental groundwater deliveries to Project lands in EBID and to Project lands in the Mesilla Valley portion of EPCWID.

- *Project Performance Metrics:*

Annual Project performance metrics, including the Project diversion ratio and service area delivery efficiencies. The Project diversion ratio is calculated as the sum of gross annual Project allocation charges divided by annual Project releases from Caballo Dam. Service area delivery efficiencies are calculated as the total Project surface-water delivery divided by the net surface-water diversion to each service area.

Model results for the parameters listed above are presented, in graphical and tabular form, in a digital appendix to this memorandum.

1 Table 2: Summary of Formatted Operational and Hydrologic Parameters Provided in Appendix A

Parameter Name	Description	Workbook(s) / Worksheet(s)
<b>Annual Allocated Water</b>	<p>Diversion allocations to EBID and EPCWID determined during each year based on usable water available for current year allocation. Annual allocated water is updated each month throughout the year.</p> <p><b>Alternatives 1, 2, 3:</b> Annual Allocated Water is computed based on the D1 and D2 equations, adjusted for current-year actual project performance per the diversion ratio provision of the Operating Agreement.</p> <p><b>Alternatives 4, 5:</b> Annual Allocated Water is computed based on the D1 and D2 equations, without adjustment.</p>	<p>ALLOCATION.xlsx / EBID Annual ALLOCATION.xlsx / EPCWID Annual</p>
<b>Carryover Water</b>	<p>Diversion allocations to EBID and EPCWID determined at start of each year based on the allotment balance remaining at the end of the previous year</p> <p><b>Alternatives 1, 2, 4:</b> Carryover Water is computed at the start of each water year from each district's unused allocation balance at the end of the previous year per the carryover provision of the Operating Agreement; Carryover Water is then held constant over the year.</p> <p><b>Alternatives 3, 5:</b> Carryover Water is equal to zero.</p>	<p>ALLOCATION.xlsx / EBID Carryover ALLOCATION.xlsx / EPCWID Carryover</p>

Parameter Name	Description	Workbook(s) / Worksheet(s)
<b>Total Diversion Allocation</b>	<p>Total diversion allocations to EBID, EPCWID, and Mexico each year.</p> <p><b>Alternatives 1-5:</b> Total diversion allocations to EBID and EPCWID are equal to the sum of each district's respective Annual Allocated Water and Carryover Water. Total diversion allocation to Mexico is calculated based on the D1 regression equation as specified in the Operating Agreement.</p>	<p>ALLOCATION.xlsx / EBID Total  ALLOCATION.xlsx / EPCWID Total  ALLOCATION.xlsx / MEXICO Total</p>
<b>Total Storage</b>	<p>Total volume of water in Elephant Butte and Caballo reservoirs at the end of each month (acre-feet).</p> <p><b>Alternatives 1, 3, 4, 5:</b> Total storage computed as sum of Project water, Rio Grande Compact credit water, and San Juan-Chama Project water in Elephant Butte Reservoir and Project water in Caballo Reservoir; Rio Grande Compact credit water adopted from URGIA; Rio Grande Project water simulated by RMBHM; San Juan-Chama water storage computed via post-processing.</p> <p><b>Alternatives 2:</b> Total storage computed as sum of Project water and Rio Grande Compact credit water in Elephant Butte Reservoir and Project water in Caballo Reservoir; Rio Grande Compact credit water adopted from URGIA; Rio Grande Project water simulated by RMBHM; no San Juan-Chama Project water is stored in this alternative.</p>	<p>RESERVOIR_STORAGE.xlsx / STORAGE Total</p>

Parameter Name	Description	Workbook(s) / Worksheet(s)
<b>Project Storage</b>	<p>Total volume of Project water in Elephant Butte and Caballo reservoirs at the end of each month, exclusive of Rio Grande Compact credit water and San Juan-Chama Project water (acre-feet)</p> <p><b>Alternatives 1-5:</b> Total storage computed as sum of Project water in Elephant Butte and in Caballo Reservoirs; Rio Grande Project water simulated by RMBHM.</p>	<p>RESERVOIR_STORAGE.xlsx / STORAGE ElephantButte.Project RESERVOIR_STORAGE.xlsx / STORAGE Caballo.Project</p>
<b>Elephant Butte Storage</b>	<p>Total volume of water in Elephant Butte Reservoir at the end of each month, including Project water, Rio Grande Compact credit water, and San Juan-Chama Project water (acre-feet)</p> <p><b>Alternatives 1, 3, 4, 5:</b> Total Elephant Butte storage computed as sum of Project water, Rio Grande Compact credit water, and San Juan-Chama Project water in Elephant Butte Reservoir; Rio Grande Compact credit water adopted from URGIA; Rio Grande Project water simulated by RMBHM; San Juan-Chama water storage computed via post-processing.</p> <p><b>Alternative 2:</b> Total Elephant Butte storage computed as sum of Project water and Rio Grande Compact credit water; Rio Grande Compact credit water adopted from URGIA; Rio Grande Project water simulated by RMBHM; no San Juan-Chama Project water is stored in Elephant Butte Reservoir under Alternative 2.</p>	<p>RESERVOIR_STORAGE.xlsx / STORAGE ElephantButte.Project RESERVOIR_STORAGE.xlsx / STORAGE ElephantButte.RGCC RESERVOIR_STORAGE.xlsx / STORAGE ElephantButte.SJC Project RESERVOIR_STORAGE.xlsx / STORAGE ElephantButte.Total</p>

<b>Parameter Name</b>	<b>Description</b>	<b>Workbook(s) / Worksheet(s)</b>
<b>Elephant Butte Elevation</b>	<p>Water surface elevation of Elephant Butte Reservoir at the end of each month (feet above mean sea level).</p> <p><b>Alternatives 1-5:</b> Reservoir elevation computed from Elephant Butte storage using Elephant Butte Reservoir area-capacity-elevation relationship (Reclamation 2007, Reclamation 2008a).</p>	RESERVOIR_ELEVATION.xlsx / ELEVATION ElephantButte
<b>Elephant Butte Surface Area</b>	<p>Reservoir surface area of Elephant Butte Reservoir at the end of each month (acres).</p> <p><b>Alternatives 1-5:</b> Reservoir surface area computed from Elephant Butte storage using Elephant Butte Reservoir area-capacity-elevation relationship (Reclamation 2007, Reclamation 2008a).</p>	RESERVOIR_AREA.xlsx / AREA ElephantButte
<b>Project Release</b>	<p>Total volume of Project water released from Caballo Dam during each year to meet Project diversion demands (acre-feet).</p> <p><b>Alternatives 1-5:</b> Project release simulated by RMBHM.</p>	RELEASE.xlsx / RELEASE Project
<b>Non-Project Release</b>	<p>Total volume of non-Project water released Caballo Dam during each year for non-Project purposes (acre-feet).</p> <p><b>Alternatives 1-5:</b> Non-Project release specified as input to RMBHM.</p>	RELEASE.xlsx / RELEASE Non-Project

Parameter Name	Description	Workbook(s) / Worksheet(s)
<b>Spill Release</b>	<p>Total volume of water released from Caballo Dam as reservoir spills during each year (acre-feet).</p> <p><b>Alternatives 1-5:</b> Project release simulated by RMBHM.</p>	RELEASE.xlsx / RELEASE Spill
<b>River Release</b>	<p>Total volume of water released from Caballo Dam to the Rio Grande during each year (acre-feet).</p> <p><b>Alternatives 1-5:</b> Total Release is calculated as the sum of Project and spill releases; non-Project water is released directly to Bonita Private Lateral.</p>	RELEASE.xlsx / RELEASE RiverTotal
<b>Total Release</b>	<p>Total volume of water released from Caballo Dam during each year (acre-feet).</p> <p><b>Alternatives 1-5:</b> Total Release is calculated as the sum of Project, non-Project, and spill releases.</p>	RELEASE.xlsx / RELEASE Total

Parameter Name	Description	Workbook(s) / Worksheet(s)
<b>Gross Diversions</b>	<p>Total volume of Project surface-water diverted from the Rio Grande at canal headings for Percha Canal, Arrey Canal, Leasburg Canal, Eastside Canal, Westside Canal, American Canal, and Acequia Madre and summed over headings; total volume of Project surface-water diverted to EBID at river headings; total volume of water diverted to EPCWID at river headings and bypass locations; total volume of water diverted to Mexico at river headings (acre-feet).</p> <p><b>Alternatives 1-5:</b> Gross diversions simulated by RMBHM.</p>	<p>DIVERSION_GROSS.xlsx /  Gross Diversion PERCHA LATERAL  DIVERSION_GROSS.xlsx /  Gross Diversion ARREY CANAL  DIVERSION_GROSS.xlsx /  Gross Diversion LEASBURG CANAL  DIVERSION_GROSS.xlsx /  Gross Diversion EASTSIDE CANAL  DIVERSION_GROSS.xlsx /  Gross Diversion WESTSIDE CANAL  DIVERSION_GROSS.xlsx /  Gross Diversion AMERICAN CANAL  DIVERSION_GROSS.xlsx /  Gross Diversion ACEQUIA MADRE  DIVERSION_GROSS.xlsx /  Gross Diversion EBID  DIVERSION_GROSS.xlsx /  Gross Diversion EPCWID  DIVERSION_GROSS.xlsx /  Gross Diversion MEXICO</p>
<b>Net Diversions</b>	<p>Net surface-water diversion to each district (acre-feet).</p> <p><b>Alternatives 1-5:</b> Net diversions calculated for each district as gross diversions minus water bypassed to a downstream district or to the Rio Grande.</p> <p><u>NOTE:</u> Net diversions to EPCWID calculated for Mesilla Valley only.</p>	<p>DIVERSION_NET.xlsx / Net Diversion EBID  DIVERSION_NET.xlsx / Net Diversion EPCWID (R&amp;M Only)</p>

Parameter Name	Description	Workbook(s) / Worksheet(s)
<b>Farm Surface Water Deliveries</b>	<p>Total volume of surface-water delivered to farms (i.e., take out of conveyance and applied to irrigated lands; acre-feet).</p> <p><b>Alternatives 1-5:</b> Farm surface-water deliveries simulated by RMBHM.</p> <p><u>NOTE:</u> Farm surface-water deliveries to EPCWID calculated for Mesilla Valley only.</p>	<p>FARM_SW_DELIVERY.xlsx / SW Delivery EBID</p> <p>FARM_SW_DELIVERY.xlsx / SW Delivery EPCWID (R&amp;M Only)</p>
<b>Farm Groundwater Deliveries</b>	<p>Total volume of groundwater delivered to farms (i.e., groundwater pumping for supplemental irrigation; acre-feet).</p> <p><b>Alternatives 1-5:</b> Farm groundwater deliveries simulated by RMBHM.</p> <p><u>NOTE:</u> Farm groundwater deliveries to EPCWID calculated for Mesilla Valley only.</p>	<p>FARM_GW_DELIVERY.xlsx / GW Delivery EBID</p> <p>FARM_GW_DELIVERY.xlsx / GW Delivery EPCWID (R&amp;M Only)</p>
<b>Farm Consumptive Use</b>	<p>Total volume of water consumed by irrigated agriculture through evapotranspiration from crops within EBID and EPCWID (acre-feet).</p> <p><b>Alternatives 1-5:</b> Farm consumptive use simulated by RMBHM.</p> <p><u>NOTE:</u> Farm consumptive use by EPCWID calculated for Mesilla Valley only.</p>	<p>FARM_CONSUMPTIVE_USE.xlsx / FarmConsumptiveUse EBID</p> <p>FARM_CONSUMPTIVE_USE.xlsx / FarmConsumptiveUse EPWID (R&amp;M)</p>

Parameter Name	Description	Workbook(s) / Worksheet(s)
<b>Farm Deep Percolation</b>	<p>Total volume of deep percolation below the root zone in irrigated areas within EBID and EPCWID (acre-feet).</p> <p><b>Alternatives 1-5:</b> Farm deep percolation simulated by RMBHM.</p> <p><u>NOTE:</u> Farm deep percolation in EPCWID calculated for Mesilla Valley only.</p>	<p>FARM_DEEP_PERCOLATION.xlsx / FarmDeepPercolation EBID</p> <p>FARM_DEEP_PERCOLATION.xlsx / FarmDeepPercolation EPWID(R&amp;M)</p>
<b>Farm Net Recharge</b>	<p>Total volume of net recharge below the root zone in irrigated areas within EBID and EPCWID (acre-feet).</p> <p><b>Alternatives 1-5:</b> Farm net recharge simulated by RMBHM as deep percolation minus farm well pumping minus direct uptake of groundwater by crops.</p> <p><u>NOTE:</u> Farm net recharge in EPCWID calculated for Mesilla Valley only.</p>	<p>FARM_NET_RECHARGE.xlsx / FarmNetRecharge EBID</p> <p>FARM_NET_RECHARGE.xlsx / FarmNetRecharge EPWID(R&amp;M)</p>
<b>Seepage Recharge</b>	<p>Total volume of recharge to groundwater from stream seepage within EBID and EPCWID (acre-feet).</p> <p><b>Alternatives 1-5:</b> Seepage recharge simulated by RMBHM using SFR package in MODFLOW-OWHN; seepage summed over stream segments within each district.</p> <p><u>NOTE:</u> Seepage recharge within EPCWID calculated for Mesilla Valley only.</p>	<p>SEEPAGE_RECHARGE.xlsx / SEEPAGE RECHARGE EBID</p> <p>SEEPAGE_RECHARGE.xlsx / SEEPAGE RECHARGE EPWID(R&amp;M)</p>

Parameter Name	Description	Workbook(s) / Worksheet(s)
<b>Groundwater Head (timeseries)</b>	<p>Monthly groundwater head (water table elevation) at selected locations corresponding to monitoring wells in the Rincon and Mesilla valleys (feet above mean sea level).</p> <p><b>Alternatives 1-5:</b> Groundwater head simulated by RMBHM.</p> <p><u>NOTE:</u> See worksheet 'WELL LOCATIONS' for description of well locations, depths, and distance from the Rio Grande.</p>	HEAD.xlsx / <Well-ID>
<b>Groundwater Head (grids)</b>	<p>Spatially distributed groundwater heads in the upper model layer (layer 1) at selected times throughout the simulation period (feet above mean sea level).</p> <p><b>Alternatives 1-5:</b> Groundwater head simulated by RMBHM.</p>	HEAD.Grid_<YEAR>.xlsx / <Alternative>.<Scenario>
<b>Diversion Ratio</b>	<p>Annual diversion ratio for Rio Grande Project, computed as total annual Project diversions at river headings divided by total annual Project release (dimensionless).</p> <p><b>Alternatives 1-5:</b> Calculated from sum of simulated annual gross diversions and annual releases.</p>	CONVEYANCE.xlsx / DivRatio

Parameter Name	Description	Workbook(s) / Worksheet(s)
<b>Delivery Efficiency</b>	<p>Annual delivery efficiency for each district, computed as total annual Project surface-water delivery divided by total net surface-water diversion for each district (dimensionless).</p> <p><b>Alternatives 1-5:</b> Calculated from sum of simulated annual surface-water deliveries and net diversions.</p> <p><u>NOTE:</u> Delivery efficiency for EPCWID calculated for Mesilla Valley only.</p>	<p>CONVEYANCE.xlsx / DeliveryEfficiency EBID  CONVEYANCE.xlsx / DeliveryEfficiency EPCWID (R&amp;M)</p>

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# Appendix A:

## Formatted Model Results for Selected Operational and Hydrologic Parameters

Digital Appendix File List:

ALLOCATION.xlsx  
CONVEYANCE.xlsx  
DIVERSION\_GROSS.xlsx  
DIVERSION\_NET.xlsx  
FARM\_CONSUMPTIVE\_USE.xlsx  
FARM\_DEEP\_PERCOLATION.xlsx  
FARM\_GW\_DELIVERY.xlsx  
FARM\_NET\_RECHARGE.xlsx  
FARM\_SW\_DELIVERY.xlsx  
HEAD.xlsx  
RELEASE.xlsx  
RESERVOIR\_AREA.xlsx  
RESERVOIR\_ELEVATION.xlsx  
RESERVOIR\_STORAGE.xlsx  
SEEPAGE\_RECHARGE.xlsx  
HEAD.GRID\_2010.xlsx  
HEAD.GRID\_2020.xlsx  
HEAD.GRID\_2030.xlsx  
HEAD.GRID\_2040.xlsx  
HEAD.GRID\_2050.xlsx

# Appendix B:

## Model Files and Unformatted Model Output

Digital Appendix File List<sup>9</sup>:

EIS.Alt1.ScenarioP25.zip  
EIS.Alt1.ScenarioP50.zip  
EIS.Alt1.ScenarioP75.zip  
EIS.Alt3.ScenarioP25.zip  
EIS.Alt3.ScenarioP50.zip  
EIS.Alt3.ScenarioP75.zip  
EIS.Alt4.ScenarioP25.zip  
EIS.Alt4.ScenarioP50.zip  
EIS.Alt4.ScenarioP75.zip  
EIS.Alt5.ScenarioP25.zip  
EIS.Alt5.ScenarioP50.zip  
EIS.Alt5.ScenarioP75.zip

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<sup>9</sup> Alternatives 1 and 2 utilize the same Rio Grande Project operating procedures and differ only with respect to storage of SJC Project water (see Section 5). RMBHM model files and unformatted output for Alternative 1 are used to evaluate Alternative 2; differences between Alternative 1 and Alternative 2 occur during post-processing of SJC Project water in Elephant Butte Reservoir. Post-processed storage results for Alternatives 1 and 2 are provided in Appendix A.

# Addendum:

## Additional Documentation of Model Software

This addendum provides additional documentation of the integrated hydrologic modeling software used by RMBHM.

As summarized in Section 6.1 of this technical memorandum, RMBHM uses a version of the MODFLOW One Water Hydrologic Flow Model (MODFLOW-OWHM) that has been enhanced with additional software features developed and implemented by Reclamation in collaboration with USGS. These new software features provide the capability to simulate Rio Grande Project (Project) surface-water operations, including Project storage, allocation, release, diversion, delivery, and water accounting. New features are linked to existing features of MF-OWHM, including the Farm Process (FMP) and streamflow routing package (SFR), to allow dynamic simulation of both surface-water and groundwater management and use.

The new software features used by RMBHM to simulate Project surface-water operations are the basis of the newly developed Surface Water Operations Process (SWO) for MODFLOW-OWHM (Reclamation 2015)<sup>1</sup>. SWO was developed as a collaborative effort between the Reclamation and USGS to allow dynamic simulation of large-scale surface-water management within MODFLOW-based hydrologic models. By simulating large-scale water management within the integrated hydrologic framework of MODFLOW-OWHM, SWO allows for simulation and analysis of two-way feedbacks between groundwater and surface-water management and use. As summarized in Section 6.1, the new features provided by SWO allow for analysis of the effects of reservoir operations and surface-water distribution on groundwater recharge and demand, as well as effects of groundwater use on surface-water availability, conveyance, and management. Detailed documentation of SWO is provided by Reclamation (2015).

As described in Section 3.5 of Reclamation (2015), SWO requires the user to specify a project-specific allocation procedure in the form of a Fortran subroutine compiled with the MODFLOW-OWHM source code. Four allocation subroutines were developed for RMBHM corresponding to each of the four allocation alternatives considered in the Rio Grande Project Operating Agreement EIS (see Section 5 of this technical memorandum). The allocation procedure for Alternative 1 calculates annual diversion allocations to EBID, EPCWID, and

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<sup>1</sup> Reclamation (2015). User Guide to the Surface Water Operations Process: An Integrated Approach to Simulating Large-Scale Surface Water Management in MODFLOW-Based Hydrologic Models. U.S. Department of the Interior, Bureau of Reclamation, Technical Memorandum No. 86-68210-2016-02; Denver, CO; December 2015.

Mexico according to the procedures specified in the Rio Grande Project Operating Agreement (Reclamation et al. 2008) and the corresponding Operations Manual (Reclamation et al. 2012). The allocation procedure was subsequently modified for Alternatives 3, 4, and 5 as summarized in Section 5 of this technical memorandum.

In addition to the allocation subroutines developed for each alternative, the version of SWO used by RMBHM exhibits minor differences compared to the description provided by Reclamation (2015). These differences are summarized below.

***Changes to SWO Input Files:***

The version of SWO used by RMBHM exhibits minor changes to the SWO inputs compared to the detailed description provided by Reclamation (2015). These changes do not affect the calculations performed by SWO. Changes to inputs include:

- **SWO Key Word**  
Reclamation (2015) describes the SWO input file as being read from the MODFLOW name file. The version of SWO used by RMBHM instead reads the SWO input file from within the input file for the Farm Process (FMP). In this version, SWO is activated by specifying the key word “SWOPS” in the FMP input file following the list of surface-water flags in Item 2(c) (see Hanson et al. 2014, Appendix A). If the key word “SWOPS” is included in the FMP file, then the file path and filename of the SWO input file are read from the following line of the file.
- **SWO Input Items**  
The version of SWO used by RMBHM includes several input items that are not included in the description provided by Reclamation (2015). These inputs were anticipated to be used by SWO in surface-water allocation and accounting calculations. The final version of SWO, however, did not actually use these inputs in any calculations; the inputs were therefore removed from the general SWO input file described by Reclamation (2015). These inputs are present in the input files for RMBHM used in support of the EIS and are therefore described below. These input items do not affect any of the calculations performed by SWO as described by Reclamation (2015).

Input Item 8: Allocation Options

Chapter 5 of Reclamation et al. (2015) defines Item 8 of the SWO input file as consisting of a single allocation option **AllocDate** that specifies the day of year for the first day of the water year as a decimal date. The RMBHM input file includes two input flag in Item 8, read from the same line. The additional option in the RMBHM input file is read as an integer value before **AllocDate** (i.e., the unused option is the first item on this line

of the SWO input file). This item was intended to specify the allocation type used in a given simulation; however, SWO ultimately requires that the allocation procedure be specified by the user as a Fortran subroutine. As a result, this option is not used. However, this option must be present in the SWO input files for RMBHM or an error will occur when reading the input file.

#### Input Item 9: SWO Reservoir Dimensions

Chapter 5 of Reclamation (2015) defines Item 9 of the SWO input file as consisting of a single list of integers **IRESFL(NPROJ)** specifying the number of reservoirs for each project. The RMBHM input file includes a second input list in Item 9, read from the line following **IRESFL(NPROJ)**. The second list was intended to specify whether a given reservoir is linked to the General Head Boundary Package (GHB) to a head boundary corresponding to the reservoir surface elevation. The linkage between SWO and GHB was not implemented in the initial version of SWO described by Reclamation (2015) and is therefore not described in Chapter 5 of that document. However, this option must be present in the SWO input files for RMBHM or an error will occur when reading the input file.

#### Input Item between Item 9 and Item 10: Grid Index Arrays

The RMBHM input file includes four additional input items between Items 9 and 10 described by Reclamation (2015), each read from a separate line of the SWO input file. Each of the four inputs between Items 9 and 10 is a two-dimensional array of integer index values. These arrays were intended to define which grid cells in the model are associated with each *project*, *division*, *unit*, and FMP-linked *beneficiary* defined in the model (see Reclamation (2015), Chapter 2). These index arrays ultimately are not used by SWO in any calculations; as a result, they were removed from the SWO input file described by Reclamation (2015). However, all four arrays must be present in the SWO input files for RMBHM or an error will occur when reading the input file.

#### ***Changes to SWO Output Files:***

The version of SWO used by RMBHM includes one additional output file that is not included in the general version of SWO described by Reclamation (2015). The additional output file is similar to the *service area* output file described in Chapter 6 of Reclamation (2015), which provides detailed information of surface-water demands, delivery and diversion orders, and actual diversions and deliveries for each *service area* represented in a given model. The additional output file in the version of SWO used by RMBHM, however, provides similar information for all conveyance network junctions within all *service areas* represented in the model. This additional output file was added to SWO for RMBHM in order to evaluate the distribution of water demands and supplies at a finer spatial scale, including distribution of water through the branched conveyance network within

each *service area*. This output file provides additional information for evaluating surface-water distribution and does not affect the calculations performed by SWO.

***Changes to SWO Diversion Order Calculation:***

The version of SWO used by RMBHM includes one change to the calculations performed by SWO compared to those described by Reclamation (2015). This change only applies to the proportionate reduction of *service area* diversion orders under over-allocated conditions—i.e., in cases where the reservoir release required to meet diversion orders exceeds the maximum possible release of project water for the current time step. As described in Reclamation (2015), in cases where the maximum project release is less than the demand-driven project release—i.e., in cases where the user-specified allocation procedure for the given *project* results in over-allocated conditions—all surface-water diversion orders served by the reservoir are reduced proportionately. This calculation was modified for RMBHM to reduce only the diversion orders for EBID and EPCWID, without reducing the delivery order for Mexico. This change was made to ensure that Mexico receives its full entitlement each year under the Convention of 1906.

# **Appendix D. Consultation and Coordination Correspondence**



# United States Department of the Interior

BUREAU OF RECLAMATION  
Upper Colorado Region  
Albuquerque Area Office  
555 Broadway NE, Suite 100  
Albuquerque, NM 87102-2352

IN REPLY REFER TO:

SEP 16 2013

ALB-150  
ENV-6.00

Interested Parties (See Enclosed List)

Subject: Invitation to Participate as a Cooperating Agency for an Environmental Impact Statement on Certain Actions within the Rio Grande Project

Dear Ladies and Gentlemen:

The Bureau of Reclamation is preparing an environmental impact statement (EIS), pursuant to the National Environmental Policy Act (NEPA), to analyze the environmental effects of continued implementation of the Rio Grande Project Operating Agreement (OA) over its entire remaining term, through 2050. In addition, this EIS will evaluate the environmental effects of renewing San Juan Chama Project storage contracts under authority of the Act of December 29, 1981, 97, 95 Stat. 1717 in Elephant Butte Reservoir.

Reclamation is responsible for coordinating the preparation of the EIS, for the administrative tasks associated with the NEPA process, and for making the final decisions, according to our authorities. The Council on Environmental Quality NEPA Implementing Regulations (40 CFR 1500-1508) call for lead agencies to reduce paperwork and delay; and eliminate duplication with state and local procedures by inviting participation of cooperating agencies to prepare an EIS. Cooperating agencies assume certain responsibilities, which may include participating in the scoping process, developing applicable information, supporting environmental analyses, and assisting the lead agency with preparation of the EIS on those topics that pertain to the cooperating agency's jurisdiction by law or special expertise.

We invite you to participate in preparing this EIS as a cooperating agency because we believe your agency or organization may have jurisdiction by law or special expertise, with respect to this actions and/or issues to be considered in this EIS. Please provide a written response by October 4, 2013, to indicate your interest in becoming a cooperating agency. In your response, please specify a point of contact. Should you request to participate as a cooperating agency, we will provide a Memorandum of Understanding (MOU) template. The MOU, which is executed through signature by Reclamation and the cooperating agency, defines the roles, responsibilities, points of contact, and other requirements and agreements, for both Reclamation and the cooperating agency.

If you have any questions about the project, or for additional information, please contact Ms. Rhea Graham at 505-462-3560 or at [rgraham@usbr.gov](mailto:rgraham@usbr.gov). Thank you for your interest and consideration.

Sincerely,

A handwritten signature in black ink, appearing to read "Mike A. Hamman", with a long horizontal flourish extending to the right.

Mike A. Hamman  
Area Manager

Enclosure

Mr. James Salopek, President  
Elephant Butte Irrigation District  
530 South Melendres Street  
Las Cruces, NM 88005

Mr. Johnny Stubbs, President  
El Paso County Water Control,  
and Improvement District No. 1  
P.O. Box 749  
Clint, TX 79836-0749

Mr. Daniel Chavez, General Manager  
Hudspeth County Conservation and Reclamation,  
District No. 1  
P.O. Box 125  
Ft. Hancock, Texas 79839

Mr. Mark Sanchez, Executive Director  
Albuquerque Bernalillo County Water,  
Utility Authority  
P.O. Box 568  
Albuquerque, NM 87103-0568

Mr. Rick Carpenter  
Water Resources and Conservation Manager  
City of Santa Fe  
Sangre de Cristo Water Division  
PO Box 909  
Santa Fe, NM 87504-0909

Mr. Pat Gordon, Commissioner  
Texas Rio Grande Compact Commission  
401 East Franklin Avenue, Suite 560  
El Paso, TX 79901-1212

Mr. Scott Verhines, State Engineer  
New Mexico Compact Commissioner  
New Mexico Office of the State Engineer  
PO Box 25102  
Santa Fe, NM 87504-5102

Mr. Dick Wolfe, State Engineer  
Colorado Compact Commissioner  
Colorado Division of Water Resources  
1313 Sherman St., Suite 821  
Denver, CO 80203

Mr. Gilbert Anaya  
Supervisory Environmental Engineer  
International Boundary & Water Commission  
United States Section  
Environmental Management Division  
4171 North Mesa, Suite C-100  
El Paso, TX 79902-1441

Dr. Jeff Pappas  
State Historic Preservation Officer and Director  
New Mexico Historic Preservation Division  
Department of Cultural Affairs  
Bataan Memorial Building  
407 Galisteo Street, Suite 236  
Santa Fe, NM 87501

Dr. Mark Wolfe  
State Historic Preservation Officer  
Texas Historical Commission  
P.O. Box 12276  
Austin, TX 78711-2276

Dr. Benjamin Tuggle  
Regional Director  
Southwest Regional Office  
U.S. Fish & Wildlife Service  
P.O. Box 1306  
Albuquerque, NM 87103-1306

education activities, scientific research projects, boundary marking, and enforcement of existing regulations. There would be no manipulation of the marsh other than emergency, safety-related, or limited improvements or maintenance actions. The destabilized marsh would continue to erode at an accelerated rate.

**Alternative B: Hydrologic Restoration and Minimal Wetland Restoration**—Under alternative B, the focus is on the most essential actions to reestablish hydrologic conditions that shield the marsh from erosive currents and protect the Hog Island Gut channel and channel wall. A breakwater structure would be constructed on the south end of the marsh, in alignment with the northernmost extent of the historic promontory, and wetlands would be restored to strategic areas where the water is less than 4 feet deep. This alternative also includes fill of some deep channel areas near the breakwater. The final element of this alternative is the reestablishment of hydrologic connections to the inland side of the Haul Road to restore bottomland swamp forest areas that were cut off when the Haul Road was constructed.

Approximately 30 acres west of the Haul Road could be influenced by tidal flows as a result. These actions would not necessarily happen in any particular order, and may be dictated by available funds. However, it is assumed that the breakwater would be constructed first. This alternative would create approximately 70 acres of various new wetland habitats and allow the continued natural accretion of soils and establishment of wetlands given the new hydrologic conditions.

**Alternative C: Hydrologic Restoration and Fullest Possible Extent of Wetland Restoration (NPS Preferred Alternative)**—Under alternative C, the marsh would be restored in a phased approach up to the historic boundary of the marsh and other adjacent areas within NPS jurisdictional boundaries. Phased restoration would continue until a sustainable marsh is achieved and the overall goals of the project are met. The historic boundaries lie between the historic promontory and Dyke Island, the triangular island off the end of the Haul Road. The outer edges of the containment cell structures would be placed at the park boundary in the river.

The initial phase of this alternative would first establish a breakwater structure at the southern alignment of the historic promontory to provide immediate protection to Dyke Marsh from erosion. After the breakwater is established, the deep channel areas north of the historic promontory would

be filled within the NPS boundary, and the marsh would be restored to the 4-foot contour at strategic locations to further reduce the risk of erosion and storm surges and promote sedimentation within the existing marsh. Afterwards, two cells would be constructed along the northern edge of the breakwater, restoring the original extent of the promontory's land mass.

All subsequent phases would establish containment cells out no further than the historic marsh boundary. The location of these cells would be prioritized based on the most benefits the specific locations could provide to the existing marsh. The timing of these subsequent phases and the size and number of cells built during these phases would be dependent upon available funds and materials.

In addition to the construction of containment cells, tidal guts would be cut into the restored marsh area that would be similar to the historical flow channels of the original marsh.

This alternative, like Alternative B, would also introduce breaks in the Haul Road, returning tidal flows to approximately 30 acres west of the Haul Road, which would help to re-establish the historic swamp forest originally found on the site.

Additional wetland may be restored south of the new breakwater to fill out the southernmost historic extent of the marsh. This area would not be protected from storms, and would be one of the last features implemented. In addition, the marsh restoration would extend north of Dyke Island, and tidal guts would be created. This alternative contains an optional restoration cell in the area currently serving as a mooring area for the marina. Such an option would only be implemented should the marina concession no longer be economically viable for the current concessioner, and then only if no other concessioner expresses interest in taking over the business, which would eliminate the need for the mooring field. In total, under this alternative, approximately 245 acres of various wetland habitats could be created.

Dated: October 21, 2013.

**Stephen E. Whitesell,**

*Regional Director, National Park Service,  
National Capital Region.*

[FR Doc. 2014-00633 Filed 1-14-14; 8:45 am]

**BILLING CODE 4310-DL-P**

## DEPARTMENT OF THE INTERIOR

### Bureau of Reclamation

[14XR0680A1, RX.00236101.0021000, RR04313000]

#### Notice of Intent To Prepare an Environmental Impact Statement and Announcement of Public Scoping Meetings for Continued Implementation of the 2008 Operating Agreement for the Rio Grande Project, New Mexico and Texas

**AGENCY:** Bureau of Reclamation, Interior.

**ACTION:** Notice of intent.

**SUMMARY:** The Bureau of Reclamation is issuing this notice to advise the public that an environmental impact statement (EIS) will be prepared for the proposed continued implementation of the 2008 Operating Agreement over its entire remaining term (through 2050) for the Rio Grande Project in New Mexico and Texas. The Operating Agreement is a written detailed description of how Reclamation allocates, releases from storage, and delivers Rio Grande Project water to users within the Elephant Butte Irrigation District (EBID) in New Mexico, the El Paso County Water Improvement District No. 1 (EPCWID) in Texas, and to users covered by the 1906 international treaty with Mexico. In addition, this EIS proposes to evaluate the environmental effects of renewing San Juan Chama Project storage contracts under authority of the Act of December 29, 1981, Pub. L. 97-140, 95 Stat. 1717, providing for storage in Elephant Butte Reservoir.

**DATES:** Comments on the scope of the EIS must be received by February 14, 2014.

Three public scoping meetings will be held to solicit public input on the scope of the EIS, potential alternatives, and issues to be addressed in the EIS. See the **SUPPLEMENTARY INFORMATION** section for meeting dates.

**ADDRESSES:** Written comments regarding the scope and content of the EIS should be sent to Ms. Rhea Graham, Bureau of Reclamation, Albuquerque Area Office, 555 Broadway NE., Suite 100, Mail Stop ALB-103, Albuquerque, New Mexico 87102, or provided via email at [rgraham@usbr.gov](mailto:rgraham@usbr.gov).

Those not desiring to submit comments or suggestions at this time, but who would like to receive a copy of the EIS, should contact Ms. Graham using the information cited above. See the **SUPPLEMENTARY INFORMATION** section for locations of public scoping meetings. **FOR FURTHER INFORMATION CONTACT:** Ms. Rhea Graham, Bureau of Reclamation;

telephone 505-462-3560; email at [rgraham@usbr.gov](mailto:rgraham@usbr.gov). Individuals who use a telecommunications device for the deaf may call the Federal Information Relay Service (FIRS) at 1-800-877-8339 to contact Ms. Graham during normal business hours. The FIRS is available 24 hours a day, 7 days a week, to leave a message or question with Ms. Graham. You will receive a reply during normal business hours.

**SUPPLEMENTARY INFORMATION:** Pursuant to the National Environmental Policy Act, Reclamation will serve as the lead federal agency for preparation of the EIS on the continued implementation of the Operating Agreement for the Rio Grande Project, New Mexico and Texas. The responsible official for this action is Reclamation's Upper Colorado Regional Director.

### Background

The Rio Grande Project includes Elephant Butte and Caballo dams and reservoirs, a power generating plant, and five diversion dams (Percha, Leasburg, Mesilla, American, and International) located on the Rio Grande in New Mexico and Texas. The Rio Grande Project was authorized by Congress under the authority of the Reclamation Act of 1902 and the Rio Grande Project Act of February 25, 1905. The Rio Grande Project Operating Agreement was signed in 2008 to allocate Rio Grande Project water, which includes water stored in Elephant Butte and Caballo reservoirs and return flows to the Rio Grande between the EBID in the Rincon and Mesilla valleys of New Mexico and the EPCWID in the Mesilla and El Paso valleys of Texas and Mexico. The Rio Grande Project also provides water to Mexico under the 1906 international treaty. Rio Grande Project water is provided by Reclamation to irrigate a variety of crops and for municipal and industrial water uses.

### Purpose and Need for Action

The purpose and need for action is to meet contractual obligations to EBID and EPCWID to implement a written set of criteria and procedures for allocating, delivering, and accounting for Rio Grande Project water to both districts consistent with their rights under applicable law each year in compliance with various court decrees, settlement agreements, and contracts. These include the 2008 Compromise and Settlement Agreement among Reclamation, EBID, and EPCWID, and contracts between the United States and the EBID and EPCWID. The purpose and need of an ancillary but potentially similar action is to implement the

provisions of the Act of December 29, 1981, to allow the storage of San Juan-Chama project water acquired by contract with the Secretary of the Interior pursuant to Public Law 87-483 in Elephant Butte Reservoir.

### Proposed Action

The proposed federal action is to continue to implement the 2008 Operating Agreement for the Rio Grande Project over the remaining term (through 2050), and a potentially similar action under 40 CFR 1508.25, to implement long-term contracts for storage of San Juan-Chama water in the Rio Grande Project.

### Scoping Process

This notice initiates the scoping process which guides the development of the EIS. To ensure that the full range of issues related to this proposed action are addressed and all significant issues identified, comments and suggestions are invited from all interested parties. Comments or questions concerning this proposed action and the EIS should be directed to Reclamation using the contact information provided above. To be most effective, written comments should be received prior to the close of the comment period and should clearly articulate the commentor's concerns.

### Dates and Addresses of Public Scoping Meetings

The scoping meeting dates and addresses are:

- Thursday, January 30, 2014, 3:00 p.m. to 5:00 p.m., Bureau of Reclamation, Albuquerque Area Office, 555 Broadway NE., Suite 100, Albuquerque, New Mexico 87102
- Friday, January 31, 2014, 6:00 p.m. to 8:00 p.m., Elephant Butte Irrigation District, 530 South Melendres Street, Las Cruces, New Mexico 88005
- Saturday, February 1, 2014, 9:00 a.m. to 11:00 a.m., Bureau of Reclamation, El Paso Field Division, 10737 Gateway West, Suite 350, El Paso, Texas 79935

### Special Assistance for Public Scoping Meetings

If special assistance is required at the scoping meetings, please contact Ms. Graham at 505-462-3560 or email at [rgraham@usbr.gov](mailto:rgraham@usbr.gov). Please notify Ms. Graham at least two weeks in advance of the meeting to enable Reclamation to secure the needed services. If a request cannot be honored, the requestor will be notified.

### Public Disclosure

Before including your address, phone number, email address, or other

personal identifying information in your comment, please be advised that your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Dated: November 5, 2013.

**Brent Rhees,**

*Deputy Regional Director—Upper Colorado Region, Bureau of Reclamation.*

[FR Doc. 2014-00476 Filed 1-14-14; 8:45 am]

**BILLING CODE 4310-MN-P**

## INTERNATIONAL TRADE COMMISSION

[Investigation No. 337-TA-904]

### Certain Acousto-Magnetic Electronic Article Surveillance Systems, Components Thereof, and Products Containing Same; Institution of Investigation Pursuant to 19 U.S.C. 1337

**AGENCY:** U.S. International Trade Commission.

**ACTION:** Notice.

**SUMMARY:** Notice is hereby given that a complaint was filed with the U.S. International Trade Commission on December 11, 2013, under section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. 1337, on behalf of Tyco Fire & Security GmbH of Switzerland; Sensormatic Electronics, LLC of Boca Raton, Florida; and Tyco Integrated Security, LLC of Boca Raton, Florida. A letter supplementing the complaint was filed on December 23, 2013. The complaint alleges violations of section 337 based upon the importation into the United States, the sale for importation, and the sale within the United States after importation of certain acousto-magnetic electronic article surveillance systems, components thereof, and products containing same by reason of infringement of U.S. Patent No. 5,729,200 ("the '200 patent'") and U.S. Patent No. 6,181,245 ("the '245 patent'"). The complaint further alleges that an industry in the United States exists as required by subsection (a)(2) of section 337.

The complainants request that the Commission institute an investigation and, after the investigation, issue a general exclusion order and cease and desist orders.

**ADDRESSES:** The complaint, except for any confidential information contained therein, is available for inspection



## United States Department of the Interior

BUREAU OF RECLAMATION  
Upper Colorado Regional Office  
125 South State Street, Room 6107  
Salt Lake City, UT 84138-1102

IN REPLY REFER TO:

ALB-103  
ENV-3.00

**JUN 24 2014**

Honorable Frederick Chino, Senior  
Mescalero Apache Tribe of the  
Mescalero Reservation  
P.O. Box 227  
Mescalero, NM 88340

Subject: Request for Consultation on Environmental Impact Statement (EIS), (Action by August 15, 2014)

Dear President Chino:

The purpose of this letter is to consult with the Mescalero Apache Tribe of the Mescalero Reservation during the preparation of the EIS for the proposed continued implementation of the 2008 Operating Agreement over its entire remaining term (through 2050) for the Rio Grande Project in New Mexico and Texas. The operating agreement is a written detailed description of how the Bureau of Reclamation allocates, releases from storage, and delivers Rio Grande Project water to users within the Elephant Butte Irrigation District (EBID) in New Mexico, the El Paso County Water Improvement District No. 1 (EPCWID) in Texas, and to users covered by the 1906 international treaty with Mexico. In addition, the EIS proposes to evaluate the environmental effects of renewing San Juan-Chama Project storage contracts under authority of the December 29, 1981, Act, Public Law 97-140, 95 Statute 1717, providing for storage in Elephant Butte Reservoir.

Reclamation's goal is to complete National Environmental Policy Act of 1969 (NEPA) compliance, in the form of a Record of Decision after completion of the EIS, no later than December 31, 2015, in order to annotate the results in the water operations manual for the Rio Grande Project before the start of the 2016 irrigation season. The enclosed Notice of Intent to prepare an EIS was issued on January 15, 2014, and scoping comments were received from two agencies. We are preparing a scoping report, and hope to award a contract for EIS preparation by October 1, 2014.

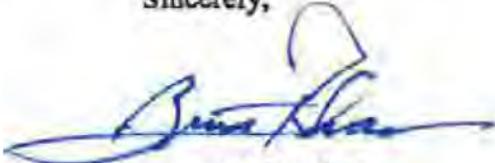
During the preparation of the Supplemental Environmental Assessment (SEA) covering the 2008 Operating Agreement from 2013-2015, the Mescalero Apache Tribe was the only tribe offering comments. The SEA is available at: <http://www.usbr.gov/uc/albuq/envdocs/ca/riogrande/op-Procud/Supplemental/Final-SuppEA.pdf>. As noted on page 76 of that document, "... in response to a Reclamation scoping letter, the Mescalero Apache Tribe had concerns with native plants

growing along the irrigation canals in the service areas of the EBID and EPCWID. The Mescalero Tribe collects plant material for cultural purposes."

The EIS will build on the SEA analyses and findings along with other appropriate analyses. Please advise if you prefer a consultation meeting with your Tribal Council, or at some other venue. We are contacting you in accordance with Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, for recommended options to facilitate further coordination. A reply by August 15, 2014, regarding your preference for consultation would be appreciated.

Please contact Ms. Rhea Graham, Special Project Officer at 505-462-3560, to request a consultation with either myself or Mr. Mike Hamman the Albuquerque Area Office Manager.

Sincerely,



Larry Walkoviak  
Regional Director

Enclosure

VIA ELECTRONIC MAIL

cc: Rene Cochise, Superintendent  
Mescalero Agency  
P.O. Box 189  
Mescalero, NM 88340  
Renc.cochise@bia.gov

Mr. Mike Hamman, Area Manager  
Albuquerque Area Office  
Bureau of Reclamation  
555 Broadway Avenue Northeast  
Suite 100 (ALB-100)  
Albuquerque, NM 87102  
Mhamman@usbr.gov



## United States Department of the Interior

BUREAU OF RECLAMATION  
Upper Colorado Regional Office  
125 South State Street, Room 6107  
Salt Lake City, UT 84138-1102

IN REPLY REFER TO:

ALB-103  
ENV-3.00

**JUN 24 2014**

Honorable Frank Paiz  
Ysleta Del Sur Pueblo  
Tribal Council Office  
P.O. Box 17579  
El Paso, TX 79907

Subject: Request for Consultation on Environmental Impact Statement (EIS), (Action by August 15, 2014)

Dear Governor Paiz:

The purpose of this letter is to consult with the Ysleta Del Sur Pueblo during the preparation of the EIS for the proposed continued implementation of the 2008 Operating Agreement over its entire remaining term (through 2050) for the Rio Grande Project in New Mexico and Texas. The operating agreement is a written detailed description of how the Bureau of Reclamation allocates, releases from storage, and delivers Rio Grande Project water to users within the Elephant Butte Irrigation District in New Mexico, the El Paso County Water Improvement District No. 1 in Texas, and to users covered by the 1906 international treaty with Mexico. In addition, the EIS proposes to evaluate the environmental effects of renewing San Juan-Chama Project storage contracts under authority of the December 29, 1981, Act, Public Law 97-140, 95 Statute 1717, providing for storage in Elephant Butte Reservoir.

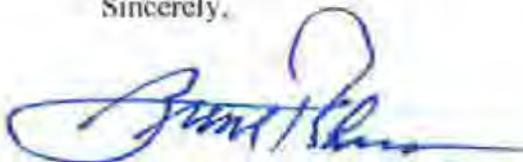
Reclamation's goal is to complete the National Environmental Policy Act of 1969 (NEPA) compliance, in the form of a Record of Decision on the NEPA review after completion of the EIS, no later than December 31, 2015, in order to annotate the results in the water operations manual for the Rio Grande Project before the start of the 2016 irrigation season. The enclosed Notice of Intent to prepare an EIS was issued on January 15, 2014, and scoping comments were received from two agencies. We are preparing a scoping report, and plan to award a contract for EIS preparation by October 2014.

During the preparation of the Supplemental Environmental Assessment (SEA) covering the 2008 Operating Agreement from 2013-2015, the Pueblo of Ysleta del Sur did not offer comments. The SEA is available at: <http://www.usbr.gov/uc/albuq/envdocs/ea/riogrande/op-Proc/Supplemental/Final-SuppEA.pdf>. The EIS, will build on the SEA analyses and findings along with other appropriate analyses. Please advise if you prefer a consultation meeting with your Tribal Council, or some other venue. We are contacting you in accordance with Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, for recommended

options to facilitate further coordination. A reply by August 15, 2014, regarding your preference for consultation would be appreciated.

Please contact Ms. Rhea Graham, Special Project Officer at 505-462-3560, to request a consultation with either myself or Mr. Mike Hamman the Albuquerque Area Office Manager.

Sincerely,



Larry Walkoviak  
Regional Director

Enclosure

VIA ELECTRONIC MAIL

cc: Mr. John Antonio, Superintendent  
Southern Pueblos Agency  
1001 Indian School Road, Northwest  
Albuquerque, NM 87104  
John.antonio@bia.gov

Mr. Mike Hamman, Area Manager  
Albuquerque Area Office  
Bureau of Reclamation  
555 Broadway Avenue, Northeast  
Suite 100 (ALB-100)  
Albuquerque, NM 87102  
Mhamman@usbr.gov



Graham, Rhea &lt;rgraham@usbr.gov&gt;

## EIS on Operating Agreement for Rio Grande Project--Letter regarding consultation

1 message

Graham, Rhea <rgraham@usbr.gov>  
To: sskin@mescaleroapachetribe.com

Wed, Oct 14, 2015 at 3:33 PM

Sher,

Thank you for taking my call and for following up with President Danny Breuninger, Sr., regarding Reclamation's letter to the Mescalero Apache Tribe (attached). The Environmental Impact Statement (EIS) is for continuation of the Operating Agreement for the Rio Grande Project until 2050, and the Supplemental Environmental Assessment (sEA), available at: <http://www.usbr.gov/uc/albuq/envdocs/ealriogrande/opProced/Supplemental/Final-SuppEA.pdf>, was for continuation of the Operating Agreement for the Rio Grande Project from 2012-2015.

As noted on page 76 of that document, "... in response to a Reclamation scoping letter, the Mescalero Apache Tribe had concerns with native plants growing along the irrigation canals in the service areas of the EBID and EPCWID. The Mescalero Tribe collects plant material for cultural purposes." We intend to honor the Mescalero Apache Tribe's response to the sEA going forward in the EIS. Our report on public scoping for this EIS can be viewed at: <http://www.usbr.gov/uc/albuq/rm/RGP/EIS/RGOA-EIS-ScopingSummary.pdf>.

We are hoping to complete the Record of Decision before the start of the irrigation season, and anticipate publishing the Draft EIS in January 2016.

Thank you for your assistance.

Rhea

Rhea Graham, Special Project Officer

Bureau of Reclamation Albuquerque Area Office

555 Broadway N.E., Suite 100, Mail Stop ALB-103

Albuquerque, NM 87102

(505) 462-3560 (Office) (505) 221-0470 (Mobile) (505) 462-3793 (Fax)

<http://www.usbr.gov/uc/albuq/rm/RGP/>

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PresChinoEIS.pdf  
1638K



Graham, Rhea &lt;rgraham@usbr.gov&gt;

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## EIS on Operating Agreement for Rio Grande Project--Letter regarding consultation

1 message

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Graham, Rhea <rgraham@usbr.gov>  
To: svillarreal@ydsp-nsn.gov

Wed, Oct 14, 2015 at 3:43 PM

Samantha,

Thank you for taking my call and for following up with Governor Carlos Hisa regarding Reclamation's letter to the Pueblo of Ysleta del Sur (attached). The Environmental Impact Statement (EIS) is for continuation of the Operating Agreement for the Rio Grande Project until 2050, and the Supplemental Environmental Assessment (sEA), available at: <http://www.usbr.gov/uc/albuq/envdocs/ealriogrande/opProced/Supplemental/Final-SuppEA.pdf>, was for continuation of the Operating Agreement for the Rio Grande Project from 2013-2015.

During the preparation of the Supplemental Environmental Assessment (SEA) covering the 2008 Operating Agreement from 2013-2015, the Pueblo of Ysleta del Sur did not offer comments. Our report on public scoping for this EIS can be viewed at: <http://www.usbr.gov/uc/albuq/rm/RGP/EIS/RGOA-EIS-ScopingSummary.pdf>.

We are hoping to complete the Record of Decision before the start of the irrigation season, and anticipate publishing the Draft EIS in January 2016.

Thank you for your assistance.

Rhea

Rhea Graham, Special Project Officer

Bureau of Reclamation Albuquerque Area Office

555 Broadway N.E., Suite 100, Mail Stop ALB-103

Albuquerque, NM 87102

(505) 462-3560 (Office) (505) 221-0470 (Mobile) (505) 462-3793 (Fax)

<http://www.usbr.gov/uc/albuq/rm/RGP/>

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GovPaizEIS.pdf  
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United States Department of the Interior

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**ORIGINAL**

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IN REPLY REFER TO:

ALB-180  
ENV-3.00

OCT 29 2015

RECEIVED  
Bob NOV 03 2015  
HISTORIC PRESERVATION DIVISION

Jeff Pappas, PhD  
Mr. Bob Estes  
New Mexico State Historic Preservation Division  
Department of Cultural Affairs  
Bataan Memorial Building  
407 Galisteo Street, Suite 236  
Santa Fe, NM 87501

Subject: National Historic Preservation Act (NHPA) Section 106 Consultation for the Rio Grande Project Operating Agreement, Rio Grande Project, New Mexico (Action by 30 days of receipt of this letter)

Dear Dr. Pappas and Mr. Estes:

The Bureau of Reclamation initiated consultation with you in 2013 under Title 54 U.S.C. § 306108, commonly known as Section 106 of the NHPA and its implementing regulations found at 36 CFR Part 800, for the "Continued Implementation of the 2008 Operating Agreement for the Rio Grande Project, New Mexico and Texas." The Operating Agreement (OA) is a written description of how Reclamation allocates, releases from storage, and delivers Rio Grande Project water to users within the Elephant Butte Irrigation District (EBID) in New Mexico, the El Paso County Water Improvement District No. 1 in Texas, and to users covered by the 1906 international treaty with Mexico.

2015 NOV 24 PM 12:40

BUREAU OF RECLAMATION  
ALBUQUERQUE AREA OFFICE  
RECEIVED

In 2013 Reclamation had determined that the continued implementation of the OA was an undertaking as defined in 36 CFR § 800.16(y). OA's are the type of activity that have the potential to cause effects on historic properties under 36 CFR § 800.3(a). On October 13, 2013, Dr. Estes sent us a letter declining our invitation to become a cooperating agency, but indicating his availability for continued consultation on the undertaking.

Since then Reclamation determined that the area of potential effects of the undertaking equates with the facilities of the Rio Grande Project, as shown in Figure 1. These include the federal facilities of Elephant Butte Dam, Caballo Dam, and five diversion dams, Percha, Leasburg, Mesilla, American, and International, and the non-federal facilities of the associated irrigation systems. It is our opinion that application of the Criteria for Evaluation and Effect has the results shown in the following table.

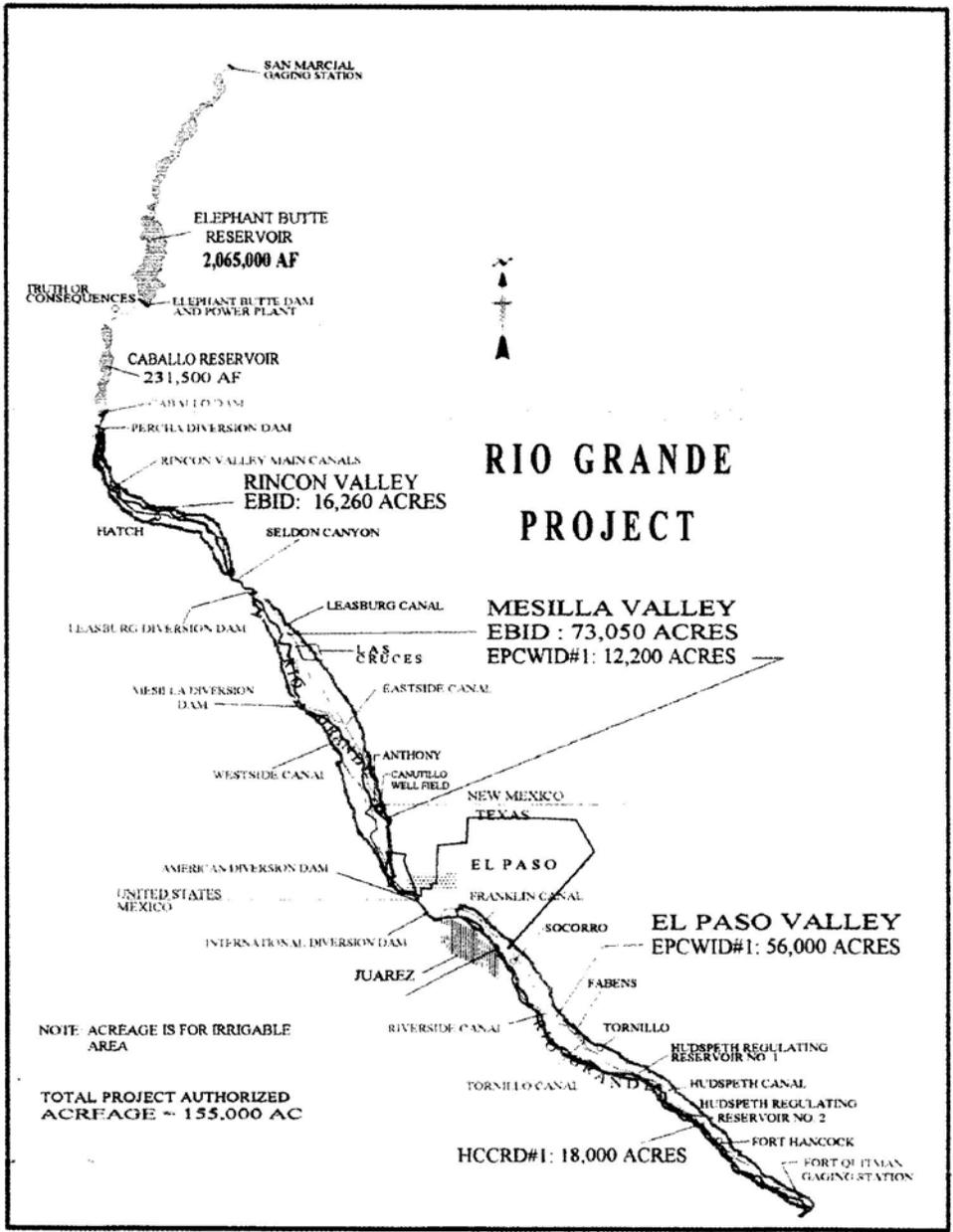


Figure 1: Map of the Rio Grande Project, showing all project facilities and area of potential effects.

Site Designation	Eligible	Criteria	Effect
Elephant Butte Dam, Sierra County, NM (NR ID 79001556)	Listed	A	No Historic Properties Affected
Percha Diversion Dam, Sierra County, NM (NR ID 789001555)	Listed	A	No Historic Properties Affected
Franklin Canal, El Paso County, TX (NR ID 92000696)	Listed	A	No Historic Properties Affected
Elephant Butte Irrigation District (NR 96001616)	Eligible	A,C	No Historic Properties Affected

Because the OA is merely a written algorithm regarding the process of accounting for storage and release of Rio Grande Project water, continuation of the agreement would not change the character or use of Rio Grande Project facilities. Reclamation has therefore concluded that a determination of "No Historic Properties Affected" pursuant to 36 CFR 800.4(d(1)) is appropriate for this undertaking.

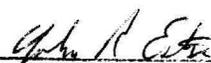
We are submitting this finding to you. If we do not receive your response within 30 days of receipt of this letter, we shall assume your concurrence. As part of the National Environmental Policy Act review process, we have initiated consultation with two Native American Tribes to address our responsibilities at 36 CFR 800.2(c)(ii). We trust you will agree with this finding and seek your concurrence that the Section 106 consultation process has been successfully completed for the undertaking. If there are any questions, please contact Mr. Hector Garcia at 505-462-3550, or at [hgarci@usbr.gov](mailto:hgarci@usbr.gov).

Sincerely,



Jennifer Faler  
Area Manager

Concur with recommendations as proposed.

  
for NM State Historic Preservation Officer

Nov 12<sup>th</sup>, 2015



# United States Department of the Interior

BUREAU OF RECLAMATION  
Upper Colorado Region  
Albuquerque Area Office  
555 Broadway NE, Suite 100  
Albuquerque, NM 87102-2352

IN REPLY REFER TO:

ALB-180  
ENV 7.00

**AUG 20 2015**

HAND DELIVERED

## MEMORANDUM

To: U.S. Fish and Wildlife Service, New Mexico Ecological Services Field Office,  
2105 Osuna NE, Albuquerque, NM 87113  
Attention: Mr. Wally Murphy

From: Jennifer Faler  
Area Manager

Subject: Biological Assessment (BA) for the Bureau of Reclamation's Proposed Continuation of the Rio Grande Project Operating Agreement (RGOA) and for the Storage of San Juan-Chama (SJ-C) Project Water in Elephant Butte Reservoir (EBR), Rio Grande Project (RGP)

The attached BA is submitted to the U.S. Fish and Wildlife Service (Service) to address the potential effects of Reclamation continuing to implement the RGOA and storing SJ-C water in EBR; on the Southwestern Willow Flycatcher (*Empidonax traillii extimus*; flycatcher), the Western Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*; cuckoo), the New Mexico meadow jumping mouse (*Zapus hudsonius luteus*; mouse), and the Rio Grande silvery minnow (*Hybognathus amarus*, minnow).

The RGOA is a written description of how Reclamation allocates RGP water to Elephant Butte Irrigation District (EBID), El Paso County Water Improvement District No.1 (EPCWID), and Mexico; consistent with applicable water rights, state and federal laws, and international treaties. The RGP and the RGOA have a long and litigious history, culminating in 2007 with Reclamation and the two districts agreeing on operating procedures. In 2008, Reclamation and the two districts signed an agreement through 2050, the RGOA, and developed a written Operations Manual, which is reviewed annually. The RGOA largely reflects historical operation of the RGP, with two key changes. First, the RGOA provides carryover accounting for any unused portion of the annual diversion allocations to EBID and EPCWID. Second, the RGOA adjusts the annual allocations by calculating the diversion ratio. The diversion ratio represents the amount of allocation used per unit release of project water from Caballo Dam.

In addition to evaluating the effects of the RGOA, this BA evaluates the effects of a Reclamation contract for storage of SJ-C water in EBR. Currently, only the Albuquerque-Bernalillo County Water Utility Authority (ABCWUA) has a contract for storage of a maximum of 50,000 acre feet per year of SJ-C water in EBR. In the future, other entities could enter into storage contracts, but the proposed action under consultation at this time is only for the ABCWUA long-term contract. Reclamation has limited discretion associated with normal EBR operations under the RGOA. Water stored in the RGP is the result of inflows dictated by Compact guidelines for New Mexico and Colorado. The needs of irrigators and irrigation delivery orders are non-discretionary and include treaty obligations to the Republic of Mexico. Irrigation release rates and times are determined by the two districts and Mexico, and are calculated to meet daily irrigation demands. Reclamation cannot restrict or increase releases to affect Article VII restrictions on upstream States. Reclamation's only discretionary actions associated with the RGOA are general operational guidelines and the two changes from historical operation mentioned above; the diversion ratio adjustments and the carry-over concept. Reclamation also has discretion over the storage of SJ-C water in EBR, and the timing of releases from EBR into Caballo Reservoir to maintain sufficient water in Caballo for irrigation demands.

Reclamation analyzed the RGOA from 2007 to 2012 with an Environmental Assessment (EA) and then from 2013 to 2015 with a Supplemental EA, both with an Endangered Species Act (ESA) determination of no effect. Throughout this period Reclamation was working on a model that could assess the RGOA for its duration through 2050 under an Environmental Impact Statement (EIS) process. Reclamation, in collaboration with the United States Geological Survey (USGS), developed the Rincon and Mesilla Basins Hydrological Model (based on the USGS's MODFLOW model) to project the effects of the RGOA and climate on water surface elevations in EBR.

Simulations were carried out using this model for three equally likely projections of future climate scenarios, including a drier scenario, a central tendency scenario, and a wetter scenario. Assuming these scenarios provide a reasonable representation of likely future climatic/hydrological conditions in the Rincon and Mesilla basins through 2050, the model results give an estimate of the expected frequency and duration of EBR at particular water surface elevations. From these elevations, we can extrapolate to effects on listed species. Reclamation's model at this time cannot separate the impacts of the RGOA, which has a much higher operational value during drought periods, from future climatic conditions. The model only projects what may happen through 2050 and is being updated in the next couple of years. For the flycatcher and cuckoo we have made a determination of "**may affect and likely to adverse affect**" the species and designated and proposed critical habitat. Since all impacts are based on a model that shows distinct EBR filling/emptying cycles, the analysis considers a range of impacts that could occur through 2050. However, the specific timing, duration, and magnitude of impacts is uncertain. Considering the current EBR water level and habitat elevation in EBR, the model under the three scenarios does not identify any adverse impacts to flycatchers and cuckoos for about 5-7 years. There is even a strong likelihood that the modeled cycles through 2050 would allow for vegetation to re-establish within EBR resulting in no net loss of habitat.

We request the Service issue a Biological Opinion (BO) that does not initially offer an incidental take statement (ITS), but that identifies a process to monitor and assess take over time. If the modeled cycles become reality, Reclamation proposes to assess potential impacts from a rising reservoir to flycatchers/cuckoos and their habitat prior to inundation, and would then seek an ITS from the Service. Reclamation would continue to monitor and assess during inundation, and specific reasonable prudent measures and terms and conditions would be identified after the reservoir recedes and the re-establishment of vegetation has been assessed.

In consideration of the information provided in the BA, our determination is that the proposed action would have **“no effect”** on the mouse or its critical habitat. For the minnow, a **“may affect, but not likely to adversely affect”** determination is warranted due to the ability of the minnow to move upstream, potentially into their critical habitat reach upstream of RM 62, whenever reservoir filling is of a sufficient magnitude and duration to produce such movement as modeled to occur after 2047.

We look forward to working cooperatively with your staff throughout this ESA consultation process to support the completion of a BO within the schedule for the associated EIS by spring 2016. Please direct any questions to Mr. Hector Garcia at 505-462-3550 or by email at [hgarci@usbr.gov](mailto:hgarci@usbr.gov).

Attachment



# United States Department of the Interior

BUREAU OF RECLAMATION  
Upper Colorado Region  
Albuquerque Area Office  
555 Broadway NE, Suite 100  
Albuquerque, NM 87102-2352

NOV 18 2015

IN REPLY REFER TO:

ALB-180  
ENV 3.00

## MEMORANDUM

To: U.S. Fish and Wildlife Service, New Mexico Ecological Services Field Office,  
2105 Osuna NE, Albuquerque, NM 87113  
Attention: Mr. Wally Murphy

From: Jennifer Faler

Subject: Action Area for the Biological Assessment (BA) for the Bureau of Reclamation's Proposed Continuation of the Rio Grande Project Operating Agreement (RGOA) and for the Storage of San Juan-Chama (SJ-C) Project Water in Elephant Butte Reservoir (EBR), Rio Grande Project (RGP)

Reclamation submitted the subject BA to the U.S. Fish and Wildlife Service (Service) on August 20, 2015. The RGOA Environmental Impact Statement (EIS) will address the potential effects of Reclamation's proposal to continue through 2050, to implement the RGOA and to store SJ-C water in EBR. After several meetings with the Service, Reclamation is defining the action area under the subject BA to only cover that area with potential effects to federally listed or proposed species, which is EBR from full pool to dead pool.

Under the National Environmental Policy Act process, the area of analysis for the RGOA EIS is relatively limited within the broader RGP geographic area and varies by resource and resource issues. The provisions of the RGOA and storage contract do not include construction of any new facilities, or other actions that are physically different or that exceed the bounds of historic operations of the RGP.

As discussed by our staff, Reclamation will continue to update both the hydrological and biological models as they pertain to the RGP, and specifically for EBR. When both models are updated and new data is available, we will coordinate with your office. The value of the biological model will be based on existing and/or updated data from the hydrological model, as it applies to the current modeled period of EBR rising between 2021 and 2026.

We look forward to continued cooperation with your staff throughout this EIS process. Please direct any questions to Mr. Hector Garcia at 505-462-3550 or by e-mail at [hgarcia@usbr.gov](mailto:hgarcia@usbr.gov).



# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

New Mexico Ecological Services Field Office  
2105 Osuna Road NE  
Albuquerque, New Mexico 87113  
Telephone 505-346-2525 Fax 505-346-2542  
[www.fws.gov/southwest/es/newmexico/](http://www.fws.gov/southwest/es/newmexico/)

December 3, 2015

Cons. #02ENNM00-2015-F-0734

### Memorandum

To: Area Manager, Bureau of Reclamation, Albuquerque, New Mexico

From: David Campbell, Branch Chief, Large River Recovery and Restoration Programs, U.S. Fish and Wildlife Service, New Mexico Ecological Services Field Office, Albuquerque, New Mexico

Subject: Initiation of Formal Consultation in response to the Biological Assessment for the Bureau of Reclamation's Proposed Continuation of the Rio Grande Project Operating Agreement and for the Storage of San Juan-Chama Project Water in Elephant Butte Reservoir, Rio Grande Project

The U.S. Fish and Wildlife Service (Service) received the U.S. Bureau of Reclamation (Reclamation) Memorandum and Biological Assessment (BA) requesting the initiation of formal consultation on the Proposed Continuation of the Rio Grande Project Operating Agreement and for the Storage of San Juan-Chama Project Water in Elephant Butte Reservoir, Rio Grande Project (Lower Rio Grande Project) on August 21, 2015, held several meetings soon thereafter, and received a memorandum dated November 25, 2015. Correspondence since the submission of the BA has addressed the action area and biological models as requested by the Service. The information required of you to initiate consultation is now considered complete.

Section 7 allows the Service up to 90 calendar days to conclude formal consultation with your agency and an additional 45 calendar days to prepare our biological opinion. However, we understand your abbreviated timeline and will attempt to accommodate that schedule.

For further correspondence associated with the Lower Rio Grande Project, please reference consultation number 02ENNM00-2015-F-0734. Please contact Ms. Vicky Ryan, Fish and Wildlife Biologist, at 505-761-4738 with any questions.



# United States Department of the Interior

BUREAU OF RECLAMATION  
Upper Colorado Region  
Albuquerque Area Office  
555 Broadway NE, Suite 100  
Albuquerque, NM 87102-2352

IN REPLY REFER TO:

ALB-180  
ENV-7.00

FEB 19 2016

VIA HAND-DELIVERY

## MEMORANDUM

To: Field Supervisor, U.S. Fish and Wildlife Service, New Mexico Ecological Services  
Field Office, 2105 Osuna NE, Albuquerque, New Mexico 87113  
Attn: Mr. Wally Murphy

From: Jennifer Faler  
Area Manager

Subject: Biological Opinion on Effects of Actions Associated With the "Proposed Continuation of the Rio Grande Project Operating Agreement and Storage of San Juan-Chama Project Water in Elephant Butte Reservoir, New Mexico", Consultation #02ENNM00-2015-F-0734, Rio Grande Project

Thank you for providing the Bureau of Reclamation with the subject Biological and Conference Opinion (BO), dated January 21, 2015 (sic, 2016). This BO is part of an ongoing Environmental Impact Statement, which requires review by Area and Regional Office staff and management. Your BO stated that it would be considered final within a 30-day period ending on February 22, 2016. I recently informally communicated with you requesting an extension of time before finalizing the BO. Reclamation has several comments that need to be resolved before finalization of the BO. Through this memorandum Reclamation is formally requesting a 30-day extension through March 22, 2016. Reclamation will seek to set up meetings shortly to discuss our comments on the BO.

We look forward to continued cooperation with your staff throughout this process. If you have any questions, please contact Mr. Hector Garcia at 505-462-3550 or by e-mail at [hgarci@usbr.gov](mailto:hgarci@usbr.gov).

## **Appendix E. Comments and Responses**

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# Appendix E. Comments and Responses

## 1 Comment-Response Process

This appendix describes the public comment and response process to finalize the EIS (FEIS). Section 1.1 defines terms useful in understanding this document and changes made to the DEIS. Section 1.2 describes how the comments were acquired, categorized, addressed, and documented. Section 1.3 provides guidance on the use of this document. Section 2 presents summary comments and responses to comment categories raised by multiple commenters. Section 3 presents individual responses. Section 4 is the scanned and marked comment documents.

### 1.1 Definitions

Several terms are helpful in assisting commenters find their comments and understanding the responses.

#### ***Comment***

A distinct statement or question about a particular topic, such as:

- Purpose and need for action
- Merits of alternatives
- Any aspect of potential environmental impacts arising from the alternatives
- Reclamation's use of facts, methods, or analyses in the EIS
- Reclamation's implementation of the NEPA process
- Matters outside the scope of the EIS

#### ***Commenter or Public***

This term includes any and all potentially interested or affected parties, whether private citizens, state, local or tribal governments, environmental groups, water users or irrigation districts, civic and community organizations, businesses, etc.

#### ***Comment category***

The resource topic or issue to which a comment is addressed. This may include the NEPA process including alternatives, the affected environment section of the EIS, or a specific resource category such as water quality.

#### ***Comment document***

A written version of comments submitted by a commenter. This may be a letter, email, or transcript of oral comments at a public hearing. A comment document may contain any number of comments.

### **Duplicate**

A comment or comment document that is the same in wording or so similar as to be virtually identical to another comment or comment document. Examples are a postcard emailed as part of an organized campaign to encourage people to comment on the DEIS or a petition through which more than one individual indicates agreement with the same comment.

### **Substantive comment**

A comment relevant to the scope of the EIS, environmental analysis, or NEPA process that merits a response. Comments that offer support or opposition to an alternative are not substantive comments. Substantive comments are those that:

- Question, with reasonable basis, the accuracy of the information in the EIS;
- Question the adequacy of the environmental analysis;
- Present reasonable alternatives other than those in the EIS;
- Merit changes or revisions to the proposal.

### **Summary comment, summary response**

A summary capturing the essence of similar comments on a given comment category and the summary response to those comments.

## **1.2 The Analytical Process**

A notice of availability of the draft EIS (DEIS) was published in the *Federal Register* on March 18, 2016. Several comments were received requesting an extension of time to comment, so the total comment period was extended to June 8, 2016 to provide 83 days to comment on the DEIS.

During the comment period, two public hearings were held: one in Albuquerque, New Mexico, another in Las Cruces, New Mexico. Transcripts of these hearings are counted as two comment documents. In addition to the hearing transcripts, each comment document was scanned electronically and assigned a consecutive number beginning with 101. Twenty-four comment documents were received by the end of the comment period (June 8, 2016) containing 148 comments.

### **1.2.1 Responding to Comments**

Each comment document was read by the interdisciplinary team to understand the overall intent and perspective of the commenter. Again, all forms of comment documents were included in this process, including emails, letters, transcripts from public meetings, records of phone calls, and attachments to comment documents. Within each comment document, all substantive comments were numbered and assigned a comment category.

In compliance with 40 CFR 1503.4, possible responses to substantive comments include:

- Modifying alternatives;
- Developing and evaluating new alternatives not previously given serious consideration in the EIS;
- Supplementing, improving, or modifying the analyses;
- Making factual corrections to the EIS;

- Explaining why the comment does not warrant further agency response or indicating those circumstances that trigger agency reappraisal or further response.

Reclamation received several comments asking for the data used as inputs and outputs to the hydrology and socioeconomic models. While these information requests were not substantive comments, these requests indicate a lack of clarity in describing the analytical processes, so Reclamation made a decision to revise the draft EIS and issue a final EIS, rather than merely issuing an errata sheet.

### 1.3 How to Use this Document and Find Your Comment

Table E-1 correlates names of commenters (individuals or organizations) with the assigned comment document number. Commenters should locate their comment document number in Table E-1 and then locate the scanned copy of their comment document in Section 4 to identify individual comments. Comment documents are arranged numerically based on date or receipt.

Within each comment document, comments are numbered consecutively. Individual responses are in Section 3. Where multiple comments were received on the same comment category, the reader may be referred to the summary comment and response section (Section 2). This helps create a more concise response section and helps guide the reader to the sections of the FEIS where the information may have changed based on responses to the comments. Summary comments and responses are presented in Section 2 alphabetically by topic.

Table E-1 Correlation of comment document number with commenters

Comment Document Number	Date Received	Commenter	Affiliation
101	3/30/2016	Welsh, Heidi	Individual
102	3/31/2016	Dixon, Deborah K.	New Mexico Interstate Stream Commission
103	4/5/2016	Stein, Jay F.	Counsel for City of Las Cruces
104	4/7/2016	Bannerman, Kim	New Mexico Interstate Stream Commission
105	4/13/2016	Bannerman, Kim	New Mexico Interstate Stream Commission Williams & Associates, Court Reporting Service
106	4/12/2016	Bannerman, Kim	New Mexico Interstate Stream Commission
107	4/13/2016	Bannerman, Kim	New Mexico Interstate Stream Commission
108	4/18/2016	Bannerman, Kim	New Mexico Interstate Stream Commission
109	4/20/2016	Bannerman, Kim	New Mexico Interstate Stream Commission
110	5/4/2016	Pelz, Jen	Wild Earth Guardians
111	5/5/2016	Pelz, Jen	Wild Earth Guardians
112	5/5/2016	Bannerman, Kim	New Mexico Interstate Stream Commission
113	5/9/2016	Houston, Robert	US Environmental Protection Agency
114	5/11/2016	Stein, Jay F.	Counsel for City of Las Cruces
115	6/1/2016	Speer Jr., James M.	Counsel for EPCWID
116	6/3/2016	Pelz, Jen	Wild Earth Guardians

117	6/8/2016	Bardwell, Beth	Audubon New Mexico
118	6/8/2016	Bixby, Kevin	Southwest Environmental Center
119	6/8/2016	Bardwell, Beth	Audubon New Mexico
120	6/8/2016	Wallace, Chad M.	Colorado Department of Law
121	6/8/2016	Dixon, Deborah K.	New Mexico Interstate Stream Commission
122	6/8/2016	Stein, Jay F.	Stein & Brockman; City of Las Cruces
123	6/8/2016	Pelz, Jen	Wild Earth Guardians
124	6/9/2016	Wunder, Matt	New Mexico Department of Game & Fish

## 2 Summary Comments and Responses

As shown in Table E-1, Reclamation received 24 comment documents since the DEIS was published in May 2016. This section presents comment categories and responses where multiple comments were made about the same topic. The comment numbers are listed here and on the scanned copies of the comment documents (Section 4). For example, comment number 101.01 is the first comment within comment document 101. The organization is alphabetically by comment category in the FEIS.

### **Category: Agriculture, Agriculture to Municipal and Industrial Conversions**

Comment Numbers: 113.02, 113.03, 113.04, 122.03

**Summary comment:** The DEIS does not adequately address impacts to agriculture and the impact of population growth on water use and demand and plans of cities to convert agricultural water to M&I water.

**Response:** The discussion of cumulative impacts in Chapter 5 of the FEIS considers potential conversion of agricultural water to M&I water. Appendix C and Section 4.1 of the FEIS explain the modeling assumptions. Briefly, simulation and analysis of project operations was carried out to evaluate relative changes in the storage, release, and delivery of project water to diversion points for EBID, EPCWID, and Mexico from the five alternatives under future simulated climatic and hydrologic conditions within the project area. The modeling did not include projections of change in future M&I demand, use, or conversions. Rather, the modeling is sufficient for analysis of changes in project operations resulting from the five alternatives, without the confounding effects of changes in M&I demand. Specific consideration of potential effects of increased demand by municipalities or M&I uses are both highly uncertain and beyond the scope of this FEIS. The amount of water used for M&I deliveries would be the same as deliveries for irrigation based on the acreage converted.

Specific to the comments from the City of Las Cruces (Commenter 114), it should be noted that the diminishment of allocation to EBID as projected under the drier climate scenarios is a function of projected climate change, not the alternatives. Under wetter conditions, EBID and by extension, the City of Las Cruces' allocation would increase to more than what they have received historically. The City of Las Cruces' comment is more focused on the drought than the alternatives.

In response to these comments, Section 3.12, Socioeconomics has been updated to include more description of population growth and agricultural resources.

**Category: Allocation**

Comment Numbers: 115.02, 120.05, 120.06, 120.17, 120.29, 121.14, 121.22

**Summary comment:** The DEIS does not adequately address historical allocations and divisions of water between the districts and the reason behind the OA.

**Response:** Many of the comments about allocation require individual responses (see Section 3.) The Summary response is that the OA was designed to correct issues that arose due to groundwater pumping in EBID and other changes in irrigation practices and cropping which altered the historical efficiencies of the project.

**Category: Alternatives**

Comment Numbers: 118.01, 121.05, 123.01, 123.04, 124.01, 124.06

**Summary comment:** Commenters proposed several alternatives, including one that brought forward during scoping.

**Response:** Section 2.3, Alternatives Considered but Eliminated from Detailed Study, has been updated to include the additional alternatives and to clarify why the alternative submitted during scoping was not analyzed. Also, see individual responses in Section 3 below.

**Category: Alternatives, No Action Alternative**

Comment Numbers 121.04, 122.01, 123.05, 123.06, 124.06

**Summary comment:** Commenters stated that the No Action Alternative was improperly construed and should be a return to pre-2008 procedures; i.e., Alternative 5 should be the No Action Alternative. They also commented that the No Action Alternative should not include a contract for storage of San Juan-Chama project water, which is Alternative 2.

**Response:** In the DEIS, the identification of the No Action Alternative as continuing with the existing elements of the OA and inclusion of the San Juan-Chama contract was based on the Council on Environmental Quality's (CEQ) "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations" (46 FR 18026, March 23, 1981, as amended). CEQ states there are two distinct interpretations of no action that an agency must consider, depending upon the nature of the proposal. The first situation is continuation of management plans or ongoing programs, the second involves Federal decisions on proposals for projects where the proposed activity would not take place. For the DEIS, the CEQ's first situation appeared to be the best fit for the proposed action. Here is the CEQ guidance:

The first situation might involve an action such as updating a land management plan where ongoing programs initiated under existing legislation and regulations will continue, even as new plans are developed. In these cases, "no action" is "no change" from current management direction or level of management intensity. To construct an alternative that is based on no management would be a useless academic exercise. Therefore, the "no action" alternative may be thought of in terms of continuing with the present course of action until that action is changed. Consequently, projected impacts of alternative management schemes would be compared in the EIS to those impacts projected for the existing plan." [CEQ 1981:No. 3]

While the interdisciplinary team felt that the DEIS's Alternative 1 was appropriately identified based on CEQ's definition of no action as continuation of management plans or

programs, given the comments received on the DEIS about making Alternative 5 the No Action Alternative, the No Action Alternative was changed for the FEIS. Alternative 5 is now the No Action Alternative and changes were made consistently in the text.

**Category: Alternatives, Carryover Accounting**

Comment Numbers: 120.26, 121.06, 121.07

**Summary comment:** The DEIS does not adequately address how carryover accounting would be calculated and the amount of carryover under the alternatives.

**Response:** Carryover water is calculated based on each district's unused allocation balance at the end of the primary irrigation season. The term "carryover" has been placed in the index so anyone wanting to check references will find them throughout the FEIS. The carryover provision was evaluated as implemented under the OA. Analysis of partial implementation or modification of the carryover procedure is beyond the scope of the FEIS.

**Category: Alternatives, Mimic Natural Hydrograph**

Comment Numbers: 124.01, 124.06

**Summary comment:** The FEIS should analyze an alternative of storing and releasing project water to benefit wildlife and to mimic a natural hydrograph.

**Response:** Reclamation operates its projects based on the specific purposes authorized by Congress, or where there is a specific legal requirement (such as the ESA) that mandates a change in the actions of storage and release of water. For the RGP, the congressionally authorized purpose is irrigated agriculture. Reclamation lacks the authority to make a release specifically for wildlife, unless consultation with the Service requires such a release to avoid jeopardizing the continued existence of a listed species or adverse modification of critical habitat.

**Category: Alternatives, Mitigation Measures, see also Climate Change**

Comment Numbers: 123.16, 124.03

**Summary comment:** The DEIS does not include mitigating measures for biological impacts. The commenters were concerned with the effect of climate change and the alternatives on vegetation and wildlife, and felt that a mitigating measure of revegetation by planting cottonwoods or willows on bare delta sediments should be included in the FEIS.

**Response:** The modelling results presented in Chapter 4 do not indicate there would be adverse effects to vegetation communities and wildlife requiring specific mitigating measures. However, through the ESA Section 7 consultation process, Reclamation committed to monitoring for any long-term effects to riparian habitat used by listed species. For any long-term adverse impacts during the predicted cycles through 2050, Reclamation will consider revegetation and the need for mitigating measures.

**Category: Alternatives, Operating Manual**

Comment Numbers: 121.08, 121.28

**Summary comment:** The DEIS does not adequately address changes to the Operating Manual and future changes that could arise that would require additional review under NEPA.

**Response:** The Operating Manual may be changed in the future by mutual consent of Reclamation and the respective boards of EBID and EPCWID. The idea behind the manual is that there are uncertainties about the actual performance of the system, effects

of climate change, and other variables, and Reclamation and the districts may need to make adjustments over time. See “Environmental Commitments” in the Summary (page iv). Reclamation agrees that if changes would result in environmental effects not previously considered, then future NEPA, ESA and other environmental analyses would be conducted.

**Category: Climate Change**

Comment Numbers: 121.36, 123.19, 123.20

**Summary comment:** The DEIS does not adequately address the impact of climate change on water resources and wildlife.

**Response:** Reclamation used the best available science of global climate change to produce climate projections under the alternatives (see Section 4.1). Climate projections inform or provide the detailed climate information that generated the wetter, central tendency, and drier climate scenarios that were used in the modelling. The method has been described by Reclamation in its *West-wide Climate Risk Assessments: Bias-Corrected and Spatially Downscaled Surface Water Projections*.

**Category: Compact, Rio Grande Compact**

Comment Numbers: 120.01, 120.02, 120.09, 120.10, 120.11, 120.18, 120.19, 120.20, 120.21, 121.17, 120.20, 122.11

**Summary comment:** The DEIS does not adequately address the relationship between the alternatives and the Rio Grande Compact. Commenters were concerned with the calculation of Compact credits. These comments also relate to Geographic Scope, because some commenters felt that there would be upstream impacts related to Article VII storage. In general, commenters were concerned with how the alternatives might affect Compact compliance.

**Response:** Most of the comments about the Compact are out-of-scope for this analysis because the alternatives do not change or impact Compact storage or relinquishment. The Rio Grande Compact Commission administers the Compact waters to ensure equitable distribution, not Reclamation. That said, because the RGP reservoirs store Compact credit water, the total storage results in the FEIS include Compact water (see Section 4.2). The total amount of water in the reservoirs is important due to potential impacts on biological resources (see Sections 4.13 to 4.16); however, Appendix C provides data about just project storage without Compact water.

The reader should refer to Section 4.6, Releases and Table E-2, which provides the data to show whether Rio Grande Compact Article VII would be impacted. A comparison of the values by alternative and climate scenarios shows little difference among the alternatives. Examination of the 50th percentile values in Table E-2 shows that across the alternatives, from 446,457 acre-feet under Alternative 1 to 438,508 acre-feet under Alternative 5, there is little difference among alternatives. In conclusion, our finding from the Section 4.6 analysis and this table is that the alternatives have no effect on Article VII restrictions.

The Summary response is that because this table and Section 4.6 show that releases are basically the same under the alternatives and the amount of water in the reservoir in storage stays the same, therefore Article VII triggering is unchanged.

Table E-2 Mean annual releases (acre-feet), 2007-2050, non-exceedance probabilities by alternative and climate scenario

Project Releases by Climate Scenario and Percentile	Alternative				
	1	2	3	4	5
<u>20th Percentile</u>					
drier	227,069	227,069	226,371	196,788	212,314
central	269,698	269,698	213,951	255,625	225,364
wetter	342,287	342,287	331,409	334,435	338,992
<u>50th Percentile</u>					
drier	446,457	446,457	431,656	450,085	438,508
central	655,444	655,444	712,025	643,252	692,498
wetter	670,995	670,995	700,846	649,809	683,352
<u>80th Percentile</u>					
drier	738,645	738,645	742,302	738,404	742,399
central	739,822	739,822	743,789	467,846	745,815
wetter	746,250	746,250	749,017	771,660	750,587

**Category: Cumulative Actions, Cumulative Impacts, and Ongoing Litigation**

Comment Numbers: 119.01, 120.03, 120.08, 120.13, 120.15, 122.05, 122.10, 123.18, 124.07, 124.08

**Summary comment:** The DEIS does not adequately describe cumulative actions that could result in cumulative impacts. Particular cumulative actions identified in the comments include: 1) water management initiatives and plans of cities, 2) USIBWC’s actions, 3) upstream exchanges of San Juan-Chama water, and 4) litigation. Some felt that ongoing litigation was inadequately referenced in the DEIS, others felt litigation should be excluded because it could affect the litigation process.

**Response:** Each of the resource sections in the DEIS Chapter 4 had a cumulative impact section. For the FEIS, these sections were moved to a new Chapter 5 highlighting cumulative actions, in particular, reasonably foreseeable future actions that could lead to cumulative impacts. All the USIBWC actions referenced in the comments were added, and this was checked with USIBWC who is a cooperating agency. Plans of the City of Las Cruces and City of El Paso were also added when they were considered relevant to the action or geographic scope as a cumulative action. References to past litigation have been retained, but references to litigation that has not been concluded have been deleted because it is not reasonably foreseeable for NEPA purposes.

**Category: Evaporation**

Comment Numbers: 121.07, 121.16

**Summary comment:** The DEIS does not adequately address evaporation losses in relation to carryover accounting and evaporative charges under the Compact. See also comments about the Compact.

**Response:** Compact credit water is treated as a fixed variable in the model and is not subject to the OA or alternatives modeled for the EIS. There is no specific amount identified as evaporative loss.

**Category: Geographic Scope, Northern Boundary**

Comment Numbers: 121.09, 115.01, 121.15, 121.18, 123.09, 123.10, 123.11, 123.12, 123.13

**Summary comment:** The DEIS does not adequately define the upstream geographic scope of analysis. Some felt the FEIS should clarify that the study area/action area should begin at the inflow area to Elephant Butte Reservoir and not be extended upstream. Others felt the geographic scope should be extended upstream due to the environmental effects of both upstream exchanges of San Juan-Chama water and conveyance of San Juan-Chama water to Elephant Butte Reservoir. Commenters who felt the geographic scope should be extended upstream also referenced concerns with the Compact, Article VII.

**Response:** See the Rio Grande Compact section for explanation of Article VII storage. The FEIS clarifies that the geographic scope begins with Elephant Butte Reservoir and does not extend upstream because the analysis of effects of the alternatives is directed at the effects of water flowing into Elephant Butte Reservoir for storage, releases, and downstream effects—not upstream. The modelling approach used to evaluate the San Juan-Chama storage provides a reasonable analysis of environmental effects within the scope of this FEIS. Any environmental effects related to San Juan-Chama water flowing downstream or exchanges upstream are out-of-scope for this FEIS but will be analyzed when such actions are ripe for analysis. The alternatives have no effect on the utilization of San Juan-Chama water. The scope for the FEIS is defined as the Rio Grande Project—not the Middle Rio Grande or San Juan-Chama Project.

**Category: Geographic Scope, Southern Boundary**

Comment Numbers: 120.27, 121.10, 121.11

**Summary comment:** The DEIS does not adequately define the downstream geographic scope of analysis. Some want to include HCCRD; others want the analysis to extend to Fort Quitman, as well as the City of El Paso, and the El Paso Valley.

**Response:** With respect to the downstream boundary for the EIS, the county line was selected because it marks the downstream end of RGP facilities. To clarify the reasoning, a detailed explanation regarding HCCRD is provided here. In 1924, HCCRD was organized to consolidate into one canal system several ditches that had been built in about 1915 and were diverting water from the Rio Grande at various points between the RGP boundary and Guayuco Arroyo. Under a Warren Act contract between HCCRD and the U.S., the district has been diverting drainage and wastewater from the RGP since 1925. Hudspeth County is included in the socioeconomic analysis, but no specific hydrological analysis was made of effects to HCCRD due to geographical location of their facilities and the nature of their contracts with the U.S. The U.S. and HCCRD have two contracts. The contract of 1924 allowed for water delivery to HCCRD from the terminus of the Tornillo Main Canal during the irrigation season. This water could not be made available from Elephant Butte Reservoir storage. The contract of 1951 provided the U.S. would deliver to HCCRD water available from the Tornillo Canal, the Fabens Waste Channel, and the outlet of the Tornillo Drain without the use of project storage.

With respect to expanding the analysis to include the City of El Paso or the El Paso Valley, the M&I water is part of the irrigation delivery to EPCWID that is analyzed in the FEIS.

**Category: Groundwater**

Comment Numbers; 120.04, 120.14, 120.16, 120.24, 120.31, 121.12, 121.21, 121.23, 121.24, 121.25

**Summary Comment:** The DEIS does not adequately describe impacts of the alternatives on groundwater.

**Response:** Many of the comments were technical and merit individual responses. In general, the modelling results suggest that the magnitude and duration of groundwater declines are primarily driven by climate and hydrologic variability (e.g. variations in inflows to Elephant Butte Reservoir and crop irrigation requirements) as opposed to differences among the alternatives. This is clarified in Chapter 4, Section 4.9.

**Category: Groundwater Quality**

Comment Numbers: 122.09, 123.17

**Summary comment:** The DEIS does not adequately analyze impacts of the alternatives on groundwater quality.

**Response:** Specific data or models are not available to quantitatively measure whether any of the alternatives affect groundwater quality. Moreover, project operations are not based on groundwater quality, so modeling of groundwater quality was not considered necessary. Note that pumping costs are included in the EIS.

**Category: Hydrology Model**

Comment Numbers: 101.01, 102.03, 104.03, 105.03, 107.01, 108.02, 112.01, 113.05, 113.06, 114.01, 120.07, 130.12, 120.22, 120.28, 120.30, 121.19, 122.02, 122.06, 122.07, 122.08

**Summary comment:** The DEIS does not adequately describe the hydrologic model analysis methods or results.

**Response:** The description of model was edited to be clearer in Section 4.1. In Chapter 4, resources or resource topics were reformatted for ease of comparison of effects of the alternatives.

**Category: NEPA Process, Public Involvement**

Comment Numbers: 102.05, 103.01, 108.01, 109.01, 110.01, 116.01, 117.01, 121.01

**Summary comment:** Commenters requested more time to review the DEIS or the Service's Biological Opinion. One commenter asked for a supplemental EIS.

**Response:** The time extension was granted: a total of 83 days were provided for public comment on the DEIS and Reclamation's biological assessment. Reclamation will incorporate environmental commitments from the Service's opinion into the FEIS and Record of Decision.

One commenter asked for the opportunity to comment on a supplemental EIS. Given that no new information has been provided to finalize the EIS, but only clarification and reformatting of tables and text, it is not necessary to issue a supplement.

**Category: Purpose and Need**

Comment Numbers: 121.03, 123.03

**Summary comment:** Purpose and need is too narrow.

**Response:** The underlying problem to which the agency is responding with action is correct as stated. No change made.

**Category: Socioeconomics, Socioeconomic Model**

Comment Numbers: 102.02, 104.02, 105.02, 121.39, 121.41, 122.04, 121.40

**Summary comment:** The DEIS does not adequately describe the economic model analysis methods or results.

**Response:** Section 4.19 was edited to clarify the effects of the alternatives.

**Category: Vegetation Communities and Wetlands**

Comment Numbers: 124.02, 112.01

**Summary comment:** The DEIS is not adequate in describing impacts to wetlands and taking actions to promote and maintain riparian vegetation.

**Response:** Section 4.13 on vegetation was expanded to include wetlands per this comment. The vegetation section shows that cycles of rising and falling surface water in Elephant Butte Reservoir should allow natural regeneration to occur.

**Category: Wildlife and Special Status Species**

Comment Numbers: 102.01, 104.01, 111.01

**Summary comment:** Several requests were made for the Service's biological opinion. Requests were made for more updated information about wildlife, including the minnow, flycatcher and tamarisk leaf beetles.

**Response:** On May 25, 2016, the Service's Biological opinion was issued on line at: [https://www.fws.gov/southwest/es/newmexico/documents/BO/2015-0734\\_BOR\\_EBR\\_BO\\_Final\\_05252016\\_Signed.pdf](https://www.fws.gov/southwest/es/newmexico/documents/BO/2015-0734_BOR_EBR_BO_Final_05252016_Signed.pdf). Reclamation will be making environmental commitments in the Record of Decision related to the Service's opinion.

### 3 Individual Responses

In this section, each comment number and category is provided, along with the response.

101.01 Hydrology model. See Summary Comment, but response is that the Chapters 3-4 narratives regarding the hydrological model were edited for clarity and tables were provided to clarify differences among alternatives.

102.01 Special Status Species. Reclamation provided the biological assessment for public review along with the draft EIS. The Service released the biological opinion to the public when they issued their final biological opinion.

102.02 Socioeconomics. See summary comment, but the response is the Chapter 4 Socioeconomics section was edited for clarity.

102.03 Hydrology model. See summary comment, but response is that the Chapters 3-4 narratives regarding the hydrological model were edited for clarity and tables were provided to clarify differences among alternatives.

102.04 References. Copies of the references cited were provided or URLs were provided. References cited section checked to ensure citations were provided.

102.05 NEPA process. Time extension was provided to 6/8/2016.

103.01 NEPA process. Time extension was provided to 6/8/2016.

104 Duplicate of 102.01 to 102.03

105 Duplicate of 102.01 to 102.03

106 Public hearing transcript.

107 Duplicate of 102.01 to 102.03

108 Duplicate of 102.01 to 102.03

109 Duplicate of 102.01 to 102.03

110.01 NEPA process. Time extension was provided to 6/8/2016.

111 Duplicate of 110.01

112 Duplicate of 102.01 to 102.03

113.01 Vegetation, wetlands. New sections on wetlands were added to Chapters 3 – 5.

113.02 Agriculture, Agriculture to M&I conversions. See Summary Comment section for response.

113.03 Agriculture, Agriculture to M&I conversions. See Summary Comment section for response.

113.04 Agriculture, Agriculture to M&I conversions. See Summary Comment section for response.

113.05 Groundwater, surface water connectivity. Comment noted. DEIS presented results showing that groundwater pumping for supplemental irrigation in the Rincon and Mesilla basins is likely to increase under alternatives where RGP allocations to EBID decrease. No change was made for the FEIS because the assumption is that there would be 100% substitution (i.e., if surface water delivery drops by 1 acre-foot, groundwater delivery goes up by 1 acre-foot. In addition, the model assumes that there is no limit on water delivery to irrigated lands--irrigators will use surface water, then groundwater, without limit until crop irrigation requirements are met.

113.06 Hydrology model (evaporation). See Summary Comment section for response.

114 Duplicate of 102.03.

115.01 Geographic scope: northern border. See Summary Comment section for response.

115.02 Allocation. Added a definition under the Allocation section in Chapter 4 clarifying that the term in the EIS references how reclamation proposes to handle accounting for project water in the reservoirs, as well as releases and distribution to the districts and Mexico. The terms allocate and allocation in the EIS is consistent with the Compromise and Settlement Agreement among the U.S., EBID, and EPCWID. See also, summary comment section for response.

116.01 NEPA process. Time extension was provided to 6/8/2016.

117.01 NEPA process. Time extension was provided to 6/8/2016.

118.01 Alternatives. Comment added to Alternatives Considered but Rejected section of FEIS, but this request is out-of-scope for the action analyzed here.

119.01 Cumulative actions, cumulative impacts and litigation. See Summary Comment section for response.

119.02 References. Copies of the references cited were provided or URLs were provided. References cited section checked to ensure citations were provided.

120.01 Compact. See Summary Comment section for response.

120.02 Compact. See Summary Comment section for response.

120.03 Cumulative actions, cumulative impacts and litigation. See Summary Comment section for response.

120.04 Groundwater. Supplemental water would be needed by crops that need a higher amount of water, e.g. pecans versus cotton. Individual irrigations in both New Mexico and use groundwater for irrigation when Project deliveries are insufficient to meet crop irrigation requirements. Groundwater use for supplemental irrigation is widespread during periods of low Project supply, particularly in the Rincon and Mesilla valley portions of the Project. In addition, groundwater use for supplemental irrigation also occurs during periods of full Project supply due to changes in cropping patterns within the Project, including increased acreage of crops with high irrigation requirement (e.g., pecans) and decreased acreage of crops with lower irrigation requirement that were historically grown within the Project (e.g., cotton). Demand for supplemental irrigation varies among individual irrigators throughout the Project based on on-farm cropping and irrigation practices, including soil preparation such as leveling and tilling; irrigation methods such as furrow, spray, or drip; and crop selection.

120.05 Allocation. See Summary Comment section for response. See also response to comment number 120.06.

120.06 Allocation. Allocation has changed over time. This was explained in the Background sections of the DEIS, but the explanation is as follows. Up until 1951, Reclamation delivered an equal amount of water per acre to the farmers, as ordered. With the drought of the 1950s, Reclamation analyzed data from 1946 to 1950 and determined a full allocation meant 3.0412 acre-feet per acre. From 1951-1979, water was allocated equally to each acre of project land, resulting in proportionate distribution of Project

deliveries to land. After the 1979-1980 transfer of O&M responsibilities to the districts, Reclamation "allocated" water using the linear regression curves for the historic delivery (D1) and historic diversions (D2) based on deliveries from 1951-1978. From 1980-2007, water was allocated proportionately to district headings, resulting in a proportionate distribution of project diversions (at headings). Under the OA, the diversion ratio adjustment eliminates the strict allocation by proportion by adjusting EBID's annual allocation to account for changes in project performance relative to the period 1951-1978 as represented by the D-1 and D-2 curves.

120.07 Hydrology model. See summary comment, but response is that the Chapters 3-4 narratives regarding the hydrological model were edited for clarity and tables were provided to clarify differences among alternatives.

120.08 Cumulative actions, cumulative impacts and litigation. See Summary Comment section for response.

120.09 Compact. Edit done.

120.10 Compact. See Summary Comment section for response.

120.11 Compact. See Summary Comment section for response.

120.12 Hydrology model. Project water includes all inflows to the Rio Grande below Caballo Dam, including water bypassed to the Rio Grande from Project conveyance facilities (e.g., waste, operational spills) and return flows from Project drainage facilities, as well as storm runoff and groundwater discharge reaching the Rio Grande. All water diverted from the Rio Grande by EBID, EPCWID, and Mexico is thus included in Project accounting--including calculation of allocation charges, allocation credits, and the diversion ratio--regardless of how that water reached the river channel, with the exception of flood flows designated by Reclamation per Section 3.4 of the Operations Manual.

120.13 Cumulative actions, cumulative impacts and litigation. Groundwater assumptions only reach to the level that have been historically available to the Project as return flow from drains and river bank storage; however, the language was edited for clarity.

120.14 Groundwater. We are not sure why the statement creates confusion, but attempted to edit the text for clarity.

120.15 Cumulative actions, cumulative impacts and litigation. See Summary Comment section for response.

120.16 Groundwater. Reference deleted.

120.17 Allocation. Neither the Rio Grande Compact nor the OA impose an explicit limit on the amount of Project Water that may be released in a given year. Analysis carried out during the early 1950s, based on actual irrigation deliveries to Project lands during the period 1946-1950, determined that a delivery of 36.29 inches (3.024 acre-feet per acre) constituted a "normal delivery to the project lands". The D-1 Curve was later used to estimate the release from Project storage that would provide for delivery of 3.024 acre-feet per acre (assuming 155,000 irrigated acres within the Project). The resulting release of 763,842 acre-feet considered "full supply" for allocation purposes prior to the OA. A release of 790,000 acre-feet is considered "full supply" for allocation purposes under the OA. The use of 790,000 acre-feet to denote "full supply" for allocation purposes is consistent with the Rio Grande Compact, which refers to 790,000 acre-feet as a "normal release" from Project storage for any given year. Nevertheless, it should be noted that the values of 763,842 and 790,000 are used for allocation purposes only.

120.18 Compact. See Summary Comment section for response.

120.19 Compact. See Summary Comment section for response.

120.20 Compact. References to Compact edited per this comment.

120.21 Compact. See Summary Comment section for response.

120.22 Hydrology model. See response to 120.04.

120.23 Hydrology model. See response to 120.04.

120.24 Groundwater. Prior to 1980, Reclamation allocated, released, and delivered water to individual irrigators throughout EBID and EPCWID. By contrast, since 1980, Reclamation has allocated, released, and delivered Project Water to each district's authorized points of diversion. The diversion ratio provision of the OA was developed to ensure that annual allocations and deliveries to EPCWID's diversion points are consistent with historical Project delivery performance and are not impacted by depletion of stream flows and drainage return flows upstream of EPCWID's diversion points. Under current Project operations, EPCWID's final diversion point is American Diversion Dam, located at the southern end of the Mesilla Valley. Because EPCWID's final diversion occurs in the Mesilla Valley, and because water is conveyed to accounting points in El Paso Valley via concrete-lined canals, depletions occurring downstream of American Diversion Dam do not affect Project allocations and deliveries to EPCWID. Depletions occurring downstream of American Diversion Dam are therefore not considered in this EIS. For the EIS, we are only looking at the pumping in the Rincon and Mesilla Valleys because that is what affects project efficiency. Pumping in the El Paso Valley does not have the same impacts and is subsequent to the diversion of the Project water supply to EPCWID.

120.25 Edit. Done.

120.26 Alternatives, carryover. There are many reasons why a district may have unused allocation even if demands from the district's users are not fully met. For example, district allocations are not finalized until the end of the irrigation season. Monsoon inflows may reach the reservoir late in the season, too late to be put to beneficial use but early enough to increase allocations. In other cases, some users within the district may use their full water allotment from the district and still not meet their demand, whereas others with lower demand may not need their full allotment, resulting in carryover for the district.

120.27 Geographic scope, southern border. See Summary Comment section for response.

120.28 Hydrology model. Prior to 1951, Reclamation did not formally allocate water to Project lands or to EBID, EPCWID, and Mexico. Water was released to meet the delivery obligation to Mexico under the 1906 Convention, and to meet the irrigation demands of demands of irrigators throughout the Project as communicated through water orders. During the drought of the 1950s (approximately 1950-1957), Project supply was not sufficient to meet irrigation demands throughout the project. In order to deliver water on an equal basis throughout the Project, and to determine the United States' obligation to Mexico under the 1906 convention during periods of "extraordinary drought", Reclamation developed a procedure for allocating water to lands within the Project. The procedure determined the amount of water available to each acre of Project land, and the corresponding delivery obligation to Mexico based on the percent allocation to Project lands relative to a "normal delivery" of 3.024 acre-feet. The D-1 and D-2 Curves are based on the period 1951-1978 because this period is representative of historical Project allocation and operating procedures under Reclamation, prior to the transfer of operation

and maintenance responsibilities for conveyance and drainage facilities to EBID and EPCWID.

120.29 Allocation. See Summary Comment section for response.

120.30 Hydrology model. See Summary Comment section for response.

120.31 Groundwater. Groundwater pumping for supplemental irrigation historically occurred primarily from the shallow alluvial zones of the Palomas and Mesilla Basin aquifers. Similar to previous models of the Rincon and Mesilla valleys, RMBHM assumes that all groundwater pumping for supplemental irrigation occurs from the uppermost layer of the model, which generally coincides with the shallow alluvium. In response to the current drought, some irrigation wells have been drilled deeper. RMBHM maintains the assumption of previous modeling efforts that all irrigation well pumping occurs from the shallow alluvium.

121.01 NEPA process. See Summary Comment section. CEQ regulations at 1502.9 state that any agency shall prepare supplements if it makes substantial changes in the proposed action that are elevation to environmental concerns, or there are significant new circumstances or information relevant to environmental concerns, or to further purposes of the act. The team does not find these circumstances are met for this EIS.

121.02 NEPA process, irreversible and irretrievable commitments. Comment noted and see Section 1.5. With the 2007 EA, Reclamation found no significant impacts affecting the human environment; however, it committed Reclamation to gather data over the first five years of implementation to evaluate effects on the environment. In 2013, Reclamation supplemented the 2007 EA. This SEA was initially intended to analyze the potential impacts of implementing the OA through 2050. However, given the uncertainties of persisting drought and the need to improve the analytical tools, Reclamation determined that analysis of a longer period would have been of limited use (Reclamation 2013a, 2013b). In 2013, Reclamation began the development and refinement of modeling tools to thoroughly analyze the effects of implementing the OA through 2050 and to document the information in this FEIS. The Responsible Official has not determined which alternative--which elements of project accounting and delivery calculations--will be selected, but the FEIS identifies Alternative 1 as the preferred alternative.

121.03 Purpose and Need. Comment noted but do not agree it is too narrow.

121.04 Alternatives, No Action. See Summary Comment section for response.

121.05 Alternatives. A new alternative based on charges and credits would be based on data after the transfer of O&M to the districts. There is, in fact, a difference between "gross diversions" used to derive the D-2 Curve and "charged diversions" used to calculate the diversion ratio. EBID and EPCWID both understand and accept this difference as one of many negotiated aspects of the OA. Perhaps more importantly, there was no accounting for charges and credits during the D-2 period (1951-1978) as Reclamation delivered water directly to irrigators during this period.

121.06 Alternatives, carryover. . See Summary Comment section for response.

121.07 Evaporation. See Summary Comment section for response.

121.08 Alternatives, operating manual. See Summary Comment section for response.

121.09 Geographic scope, northern border. See Summary Comment section for response.

121.10 Geographic scope, southern border. See Summary Comment section for response.

121.11 Geographic scope, southern border. See Summary Comment section for response.

121.12 Groundwater. This statement regarding impacts of pumping downstream of diversion points applies to current operations, where the final delivery point to the districts is above American Dam. Neither the EIS nor the Tech Memo (Appendix C) states that "effects of pumping did not occur downstream of RGP diversion points during the historical period which forms the basis of the 2008 Operating Agreement (1951-1978)," as stated by this comment. We have not yet evaluated the extent to which changes in the El Paso Valley impact project performance relative to the D1/D2 period (e.g., how pumping in EP Valley during this period impacted seepage losses below American Dam).

121.13 Surface water, deliveries. The factors that affect the diversion ratio are predominately in the Rincon and Mesilla Valleys, and are therefore these areas are the focus of the FEIS discussion. There is an emphasis in the FEIS on those areas where the diversion ratio adjustment is determined.

121.14 Allocation.

121.15 Geographic scope, northern border. See Summary Comment section for response.

121.16 Evaporation. See Summary Comment section for response.

121.17 Compact. Comment noted, they are the same and no change was made. Also, see response to 120.21.

121.18 Geographic scope, northern border. See Summary Comment section for response.

121.19 Hydrology model. This comment is correct, there was an error in the allocation code of the RMBHM and the output described in the DEIS that affected Alternatives 1 and 2. The error was fixed in the FEIS and Appendix C. The corrected results show a decrease in the impact of Alternatives 1 and 2 on allocations and deliveries to EBID and groundwater elevations in Rincon and Mesilla Valleys. Regarding model verification, the model was verified relative to historical conditions (comparison of observed vs. simulated storage, releases, diversions for the period 1960-2004). Verification of simulations used in the FEIS was based on detailed review of model code and results to ensure that the model correctly implemented each alternative and that the model results reflected the modelers' understanding of operations under each alternative. The commenter identified an error that was not identified in the DEIS model results. See also response to comment 122.06.

121.20 Compact. Assumption inherited from URGSim model used for URGIA, not an explicit assumption of the MODFLOW model used in the FEIS.

121.21 Groundwater. Groundwater pumping by the City of El Paso from the Canutillo Well Field, located in the southern Mesilla Valley, is specified in the model input file TXCN.EIS.wel. The input file specifies a pumping volume 16,394.4 acre-feet during the primary irrigation season (March-October) and 7,164.5 acre-feet during the non-irrigation season (November-February) for a total of 23,559 acre-feet per year. Pumping volumes are applied at a constant rate over the primary irrigation season and non-irrigation season, respectively, over the duration of the simulation period. The same pumping rate is used in all simulations evaluated in this FEIS. The assumptions and model results are reasonable for FEIS purposes of comparing alternatives, but are not designed to forecast future pumping.

121.22 Allocation. Comment noted. The analysis did not emphasize one water user over another; both are described in tables and text.

121.23 Groundwater. According to the graphs provided (page 25 of comment letter), significant groundwater declines occurred from 2003-2005, prior to the OA and prior to the current drought as defined in the figure. This suggests that recent groundwater declines are independent of the OA and/or that the current drought began in 2003, as opposed to 2008, as indicated in the figure, and the drought is still ongoing. These points suggest that groundwater declines since 2003 are consistent with declines during previous drought periods, and that the duration and magnitude of declines result from prolonged drought conditions rather than from the OA.

121.24 Groundwater. While some alternatives result in larger declines than others do, the overall magnitude and trends in groundwater declines are generally similar across all alternatives. Results suggest that the magnitude and duration of groundwater declines are primarily driven by climate and hydrologic variability (e.g., variations in inflows to Elephant Butte Reservoir and crop irrigation requirement) as opposed to differences between alternatives.

121.25 Groundwater. Assumption is also consistent with NMOSE's report titled "Water Use by Categories 2010". Quoting from the report: "Table 3.3 summarizes the percentage of surface water shortages, by river basin, for 2010." The table lists the percent surface water shortage in the Rio Grande Basin, Dona Ana County, as "0, offset by supplemental well pumping." NMOSE thus uses the same assumption as used in the hydrologic modeling for the FEIS.

121.26 Groundwater quality. See Summary Comment section for response.

121.27 Releases. Release data checked and clarified in FEIS.

121.28 Alternatives, Operating Manual. See Summary Comment section for response.

121.29 Geographic scope, northern border. See Summary Comment section for response.

121.30 Wildlife, Special Status Species. The mouse was considered throughout the action area, but based on field observations and its habitat requirements; it is not present nor likely to become present in the action area.

121.31 Wildlife, Special Status Species. Comment noted. Reclamation used the best available science from monitoring data to assess effects on the minnow.

121.32 Wildlife, Special Status Species. References added as appropriate.

121.33 Wildlife, Special Status Species. Agree, comment noted.

121.34 Wildlife, Special Status Species. Comment noted. Elephant Butte Reservoir and the RGP are in the baseline and the appropriate comparison is effects of the action (Alternative 1) against the baseline. While Elephant Butte Reservoir and the RGP existence is a factor in the endangered status of the minnow, the effects of the alternatives do not change its status. The finding is correct.

121.35 Wildlife, Special Status Species. Agree, added to text.

121.36 Climate change. See Summary Comment section for response.

121.37 References. Comment noted. No change made to biological assessment because consultation has been completed.

121.38 Reservoir elevations. Comment noted. Biological assessment analysis was based on use of time series analysis of fluctuations.

121.39 Socioeconomics. Socioeconomic sections updated in Chapter 4 to be clearer.

121.40 Socioeconomics. M&I water is valued more highly than agricultural water.

121.41 Socioeconomics. Socioeconomic sections updated in Chapter 4 to be clearer.

122.1 Alternatives. No Action. See Summary Comment section for response.

122.02 Hydrology model. Assumptions and model results clarified in text.

122.03 Agriculture, Agriculture to M&I conversions. See Summary Comment section for response.

122.04 Socioeconomics, M&I water. Presently the Las Cruces water supply is not dependent on the RGP water supply and RGP OA. In the event that Las Cruces should obtain access to Project water through contracts with EBID and Reclamation, Las Cruces surface water supply deliveries would be subject to the same allocation constraints as other EBID farmers.

122.05 Cumulative actions, cumulative impacts, and litigation. See Summary Comment section for response.

122.06 Hydrology model. The RMBHM model, as stated in Section 4.1 and presented in Appendix C, meets the Information Quality Guidelines pursuant to section 515 of the Treasury and General Government Appropriations Act and subsequent guidelines of the Department of the Interior and Reclamation. The model is based on two previous hydrologic models of the Rincon and Mesilla Basins: one developed by the NMOSE and others as documented by SSPA (2007); and the other developed by the USGS and documented in Hanson et al. (2013). Both of these models underwent extensive review. The RMBHM uses the One-Water Hydrologic Flow Model (MF-OWHM; Hanson et al. 2013), an integrated hydrologic modeling software based on the USGS Modular Groundwater Model, MODFLOW. MODFLOW is considered an international standard for simulating and predicting groundwater conditions and groundwater/surface-water interactions, according to the USGS (see <http://water.usgs.gov/ogw/modflow/>). The new code features that were added for use in the FEIS simulations underwent extensive peer input (review by other Reclamation hydrologists and by technical specialists in USGS who were not involved in developing these features). Based on Comment 121.19, an error was found in the data presented in the DEIS and the data were corrected for the FEIS with results provided in tables and narrative in Chapter 4 and in Appendix C.

122.07 Hydrology model. The OA was designed to operate under the full range of climatic and hydraulic scenarios experienced since 1951. See section on model sensitivity and validity.

122.08 Hydrology model. Water budgets for any desired area may be calculated from the model results provided in the Technical Memo, but were not placed in the body of the FEIS. In addition, the error noted above resulted in over-allocation to EPCWID under Alternatives 1 and 2, but this was corrected in the FEIS. Otherwise, the model reflects the allocation and accounting procedures defined in the OA and Operations Manual.

122.09 Groundwater quality. See Summary Comment section for response.

122.10 Cumulative actions, cumulative impacts, and litigation. See Summary Comment section for response.

122.11 Compact. See Summary Comment section for response. The alternatives do not affect Compact storage or relinquishment.

123.01 Alternatives. Comment noted. This comment is out-of-scope for this action. See Summary Comment section under northern boundary.

123.02 Alternatives. Comment noted. This comment is out-of-scope for this action. See Summary Comment section under northern boundary.

123.03 Purpose and Need. See Summary Comment section for response.

123.04 Alternatives. Comment noted. The negotiations of the OA were for an equitable distribution of the RGP water resources, consistent with historical distributives. Moreover, by identifying alternatives that vary the key elements of project accounting, Reclamation has considered a reasonable range of alternatives. The key stakeholders, EBID and EPCWID, agree that a reasonable range of alternatives was analyzed.

123.05 Alternatives; No Action. See Summary Comment section for response.

123.06 Alternatives; No Action. See Summary Comment section for response.

123.07 NEPA process, duration of action. See Section 1.5 on prior NEPA analyses. The SEA was initially intended to analyze the potential impacts of implementing the OA through 2050. However, given the uncertainties of persisting drought and the need to improve the analytical tools, Reclamation determined that analysis of a longer period would have been of limited use (Reclamation 2013a, 2013b). In 2013, Reclamation began the development and refinement of modeling tools to thoroughly analyze the effects of implementing the OA through 2050 and to document the information in this FEIS. This FEIS has been prepared to project effects of the alternatives through 2050.

123.08 Wildlife, Special Status Species. The baseline, snapshot in time, was based on data from 2014, 2015, and Reclamation consulted on the worst case for the listed species and their habitat. For the birds, the worst case would be due to the wetter climate scenario and continued implementation of the OA and continued execution of a contract for storage of San Juan-Chama Project water in Elephant Butte; i.e., those conditions that result in a higher reservoir elevation for a prolonged duration.

123.09 Geographic scope, northern border. See Summary Comment section for response.

123.10 Geographic scope, northern border. See Summary Comment section for response.

123.11 Geographic scope, northern border. See Summary Comment section for response.

123.12 Geographic scope, northern border. See Summary Comment section for response.

123.13 Geographic scope, northern border. See Summary Comment section for response.

123.14 Surface water. Text edited regarding low flow conveyance channel.

123.15 Wildlife, special status species. Comment noted. The biological assessment and Service's biological opinion (Appendix F) were prepared in consideration of recovery of the species and the recovery plan. One of Reclamation's commitments will be a Southwest willow flycatcher and cuckoo management plan. No change to text.

123.16 Alternatives, mitigation measures. See Summary Comment section for response.

123.17 Groundwater, vegetation, wildlife, aquatic resources. Groundwater levels covered in Chapter 4 based on two representative wells. Other resources had qualitative assessments based on the outputs of the hydrology model.

123.18 Cumulative actions, cumulative impacts, and litigation See Summary Comment section for response. Specific to this comment, the OA does not affect upstream river management. Elephant Butte storage would only impact upstream river management during flood routing and flood control operations.

123.19 Climate change. See Summary Comment section for response.

123.20 Climate change. References reviewed and added as appropriate. Also see Summary Comment section for response.

123.21 Wildlife, special status species. Comment noted. The correct analysis is a comparison of the effect of the proposed action against the baseline--the snapshot of the species when the consultation occurred; i.e., 2015. Given that this is a projection into the future, and that projection indicates there will be cycles of wetting and drying, the effects to primary constituent elements of the birds' habitat should be beneficial due to vegetation rejuvenation. The effects of the preferred alternative, when compared to the baseline, does not meet the jeopardy standard. However, Reclamation acknowledges that the status of the listed species is endangered and threatened.

124.01 Alternatives. Reclamation operates its projects based on congressionally authorized purposes, in this case, irrigated agriculture in the U.S. and Mexico. Reclamation is mandated to make releases to benefit irrigated agriculture; it cannot adopt a more natural flow regime absent a change in Congressional authorization.

124.02 Vegetation. Fluctuations in Elephant Butte Reservoir surface elevations may help maintain diverse and dynamic riparian vegetation.

124.03 Alternatives; mitigation measures. See Summary Comment section for response.

124.04 Wildlife, special status species. Commitments to manage noxious weeds incorporated in vegetation section.

124.05 Wildlife, special status species. Comment noted. The biological assessment and biological opinion of the Service were prepared in consideration of recovery of the species and the recovery plan. One of Reclamation's commitments will be a Southwest willow flycatcher and cuckoo management plan. No change to text.

124.06 Alternatives. Comment noted. Reclamation operates its projects based on congressionally authorized purposes, in this case, irrigated agriculture. Reclamation is required by law to make releases to benefit irrigated agriculture; it cannot adopt a more natural flow regime absent a change in Congressional authorization.

124.07 Cumulative actions, cumulative impacts, litigation. See Summary Comment section for response.

124.08 Cumulative actions, cumulative impacts, litigation. See Summary Comment section for response.

## **4 Scanned Comment Documents**



Graham, Rhea &lt;rgraham@usbr.gov&gt;

## Draft EIS - Rio Grande Project - Request for Digital Appendices

Graham, Rhea <rgraham@usbr.gov>  
To: Heidi Welsh <heidi431@aol.com>  
Cc: ADMIN RECORD <RGOA\_EIS@emp.si.net>

Wed, Mar 30, 2016 at 10:36 AM

Heidi,  
Thank you for your request. I can mail DVDs for the Appendix A & B files...we do not have access to file sharing sites with persons outside of the Federal government. Please send me your mailing address, and your affiliation, if any.

Thank you,  
Rhea

Rhea Graham, Special Project Officer

Bureau of Reclamation Albuquerque Area Office

555 Broadway N.E., Suite 100, Mail Stop ALB-103

Albuquerque, NM 87102

(505) 462-3560 (Office) (505) 221-0470 (Mobile) (505) 462-3793 (Fax)

<http://www.usbr.gov/uc/albuq/rm/RGP/>

On Wed, Mar 30, 2016 at 10:03 AM, Heidi Welsh <heidi431@aol.com> wrote:

Good Morning, Rhea –

I am reviewing the 2016 Draft EIS for the Continued Implementation of the 2008 Operating Agreement for the Rio Grande Project. I noticed there are references to the following digital appendices which contain model data and model files.

- 1 • Digital appendix files listed in Appendix A (pp. 53 of memo, PDF pp. 369): Formatted Model Results for Selected Operational and Hydrologic Parameters ("ALLOCATION.xlsx", etc.)
- Digital appendix files listed in Appendix B (pp. 54 of memo, PDF pp. 370): Model Files and Unformatted Model Output ("EIS.Alt1.ScenarioP25.zip", etc.)

I have also attached the appendices to this email.

I would like to review these data and model files. Can you upload them to an ftp or dropbox or mail them on a DVD? Due to the relatively short time period to review this information, your prompt response would be greatly appreciated.

5/11/2016

DEPARTMENT OF THE INTERIOR Mail - Draft EIS - Rio Grande Project - Request for Digital Appendices

Thanks in advance for your help.

Best Regards,  
Heidi

# NEW MEXICO INTERSTATE STREAM COMMISSION

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VIA EMAIL: [rgraham@usbr.gov](mailto:rgraham@usbr.gov) and First Class Mail

March 31, 2016

Ms. Rhea Graham  
Bureau of Reclamation, Albuquerque Area Office  
555 Broadway Boulevard NE., Suite 100  
ALB-103  
Albuquerque, NM 87102

Dear Ms. Graham:

The New Mexico Interstate Stream Commission (NMISC) is undertaking review of the Draft Environmental Impact Statement for Continued Implementation of the 2008 Operating Agreement for the Rio Grande Project (Draft EIS), released March 18, 2016. We understand that the deadline for comment is May 9, 2016. In preparing to comment, we respectfully request the following.

First, there is a large amount of supporting data and information referenced in the Draft EIS but not included in the document nor available on the Bureau of Reclamation (Reclamation) website. Without this information the NMISC is unable to conduct a meaningful review of the Draft EIS. Accordingly, the NMISC requests the following supporting information:

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- The Biological Opinion issued by the U.S. Fish and Wildlife Service and supporting data from which the analysis in the Biological Opinion was developed. (The Notice of Availability published March 18, 2016 states that the Biological Opinion is available at [http://www.fws.gov/southwest/es/NewMexico/ES\\_bio\\_op.cfm](http://www.fws.gov/southwest/es/NewMexico/ES_bio_op.cfm), however, the document was not located on the link.)

2

- The IMPLAN model utilized to analyze the socioeconomic environmental consequences of the five alternatives, including all input and output files.

3

- All digital appendix files listed in Appendix A of the Hydrology Technical Memo, which is attached to the Draft EIS as Appendix C: Formatted Model Results for Selected Operational and Hydrologic Parameters (ALLOCATION.xlsx, etc.).
- All digital appendix files listed in Appendix B of the Hydrology Technical Memo, which is attached to the Draft EIS as Appendix C: Model Files and Unformatted Model Output (EIS.Alt1.ScenarioP25.zip, etc.).

- Several references that do not include web addresses and ISC is unable to locate, including:

- 4 ○ Hanson, R. T., S. E. Boyce, W. Schmid, J. Knight, and T. Maddock, III. 2013. Integrated Hydrologic Modeling of a Transboundary Aquifer System – Lower Rio Grande. MODFLOW and More 2013: Integrated Hydrologic Modeling, Golden, Colorado, June 5-8, 2011.
- IBWC (U.S. International Boundary and Water Commission). 2014a. Flood Control Improvements to the Rio Grande Canalization Project in Vado, New Mexico, United States Section, International Boundary and Water Commission, El Paso, Texas.
- Reclamation (U.S. Department of the Interior, Bureau of Reclamation). 2002. Elephant Butte and Caballo Reservoirs Resource Management Plan and Final Environmental Impact Statement. U.S. Department of the Interior, Bureau of Reclamation, Albuquerque Area Office, Albuquerque, New Mexico.
- Reclamation (U.S. Department of the Interior, Bureau of Reclamation). 2003a. Browsing Analysis of Riparian Vegetation: Elephant Butte Project Lands. U.S. Department of the Interior, Bureau of Reclamation, Denver Technical Service Center, Denver, Colorado.
- Reclamation (U.S. Department of the Interior, Bureau of Reclamation). 2003b. Elephant Butte and Caballo Reservoirs Resource Management Plan. U.S. Department of the Interior, Bureau of Reclamation, Albuquerque Area Office, Albuquerque, New Mexico.
- Congressional Research Service, 2015. U. S. – Mexico Water Sharing: Background and Recent Developments, Congressional Research Service document 7-5700, January 23, 2015.

Please provide all the requested information in electronic format, if available, to Kim Bannerman at kim.bannerman@state.nm.us. If you do not have the information electronically, please send a hard copy to her at the address listed above.

5 Second, the NMISC requests a ninety (90) day extension of time for submitting comments, from May 9, 2016 to August 7, 2016. Reclamation has provided a very limited amount of time to comment on the Draft EIS, especially in light of the large amount of supporting material not made available in conjunction with the Draft EIS. As you are aware, the Draft EIS is a nearly 400 page document, not including all the various model files and references that need review, as well as the U.S. Fish and Wildlife Service Biological Opinion drafted in consultation with Reclamation under Section 7 of the Endangered Species Act. To provide the public meaningful opportunity to participate in the Draft EIS process, we believe this extension is warranted.

The NMISC would appreciate Reclamation make a determination on this extension request well in advance of the current May 9, 2016 comment deadline to allow us and other stakeholders the opportunity to adequately prepare comments for Reclamation.

Ms. Rhea Graham  
Bureau of Reclamation, Albuquerque Area Office  
Draft Environmental Impact Statement  
March 31, 2016  
Page 3 of 3

Thank you for the opportunity to comment on this Draft EIS and for your careful consideration of this request.

Sincerely,

A handwritten signature in cursive script, appearing to read "Deborah K. Dixon".

Deborah K. Dixon, P.E.  
Director  
New Mexico Interstate Stream Commission

DKD/kmb



ORIGINAL

103

APR 10 2016

STEIN & BROCKMANN, P.A.  
ATTORNEYS AT LAW

JAY F STEIN\*  
JAMES C BROCKMANN\*  
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STREET ADDRESS  
505 Don Gaspar Avenue  
Santa Fe, New Mexico 87505

*Of Counsel*  
KATHERINE W HALL

MAILING ADDRESS  
Post Office Box 2067  
Santa Fe, New Mexico 87504-2067  
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\* New Mexico Board Certified  
Specialists in Water Law

April 5, 2016

Ms. Rhea Graham  
Bureau of Reclamation,  
Albuquerque Area Office  
555 Broadway Blvd. NE., Ste 100  
Albuquerque, NM 87102

RE: Las Cruces' Comments to draft EIS for Continued Implementation of the 2008  
Operating Agreement for the Rio Grande Project

Dear Ms. Graham:

The City of Las Cruces will be submitting comments on the draft EIS for Continued Implementation of the 2008 Operating Agreement for the Rio Grande Project. The issues in the draft EIS are critical to Las Cruces as it relies for its water supply on groundwater from the Lower Rio Grande Underground Water Basin and needs to determine the effects of the Operating Agreement, and the increased depletions from the aquifer that result from it, on the City's water supply. To thoroughly analyze these issues, additional time will be required beyond the deadline for comments of May 9, 2016. Accordingly, the City joins with the New Mexico Interstate Stream Commission in its request of March 31, 2016, to extend the time for submitting comments from May 9, 2016, to August 7, 2016.

Thank you for your attention to this matter.

Sincerely,  
  
Jay F/Stein

CC: Jorge Garcia, Marcia Driggers, Deborah, K. Dixon, Kim Bannermann,

RECEIVED BOR ALBUQUERQUE AREA OFFICE OFFICIAL FILE COPY		
APR 07 '16		
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EXIV-6.00		Action
Prj RGP-24		
Contr #		
Lee Wilson		
Date	Initial	Tc
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4/7/2016	[Signature]	104
		102
		100



New Mexico Interstate Stream Commission

TRANSCRIPT OF PROCEEDINGS

April 7, 2016

4:00 p.m.

555 Broadway, Northwest  
Albuquerque, New Mexico 87102

Reported by: Robin A. Brazil, RPR, CCR #154  
Williams & Associates, LLC  
1608 Fifth Street, Northwest  
Albuquerque, New Mexico 87102

1 MR. RICH: Good evening. My name is  
2 Chris Rich. We are here to take comments on the Draft  
3 Environmental Impact Statement on continued  
4 implementation of the 2008 operating agreement for the  
5 Rio Grande Project Draft -- well, I already said that.  
6 New Mexico and Texas.

7 I'm the hearing officer. We are here to  
8 receive comments on the Draft EIS. Because this is for  
9 comments on the Draft EIS, it helps if you've read it if  
10 you're actually going to comment on it, because  
11 otherwise it's not a comment.

12 We will also accept written comments at this  
13 hearing.

14 This public hearing is taking place in the Rio  
15 Grande Conference Room of the Albuquerque area Office of  
16 the Bureau of Reclamation, located at 555 Broadway  
17 Boulevard, Northeast, in Albuquerque, New Mexico.

18 The US Environmental Protection Agency has  
19 given the EIS Number 20160063 to this Draft EIS.  
20 Comments are due on May 9th, 2016, to Rhea Graham of the  
21 Bureau of Reclamation. Her email is rgraham@usb.gov  
22 should you wish to provide additional comments.

23 I will take comments in the order that you  
24 signed in, and I think we'll put like a 20-minute max on  
25 comments. That sounds reasonable under the

1 circumstances.

2 Please speak clearly. We have a court  
3 reporter.

4 The -- the purpose of this meeting is to allow  
5 the public to come and give oral comments as well as  
6 providing written comments, but in order for the agency  
7 to be able to consider these comments, we have to have  
8 them written down for us, thus the court reporter, so  
9 please speak clearly and distinctly.

10 And remember, we are taking comments. This is  
11 not a question and answer. There will not be any  
12 exchanges. It's just give -- present your comments, and  
13 then we'll move on to the next person.

14 So, Kim, I think we'll start with you.

15 MS. BANNERMAN: Thank you. Do I --

16 MR. RICH: Yes. Oh, we have to be formal  
17 here.

18 MS. BANNERMAN: Thank you all. My name's  
19 Kim Bannerman. I'm an attorney with the New Mexico  
20 Interstate Stream Commission. Thank you for this  
21 opportunity to provide comments on the Draft  
22 Environmental Impact Statement.

23 I just want to state first that although I  
24 have read the document, we're not commenting in depth at  
25 this point. We haven't had time to digest everything

1 that is in the document, but we did have a couple of  
2 comments that we wanted to make today, and I also have  
3 them written, so I'll submit them in writing as well.

4           And a lot of this is a continuation of our  
5 March 31st, 2016, information request that we made in  
6 writing to Ms. Graham.

7           She responded on April 4th, I believe, but we  
8 had a couple more concerns about that information  
9 request and some additional requests.

10           First of all, in the March 31st letter, w  
11 requested the biological opinion issued by the US Fish  
12 and Wildlife Service and supporting data from which the  
13 analysis in that BO was developed.

14           We noted in our letter that the notice of  
15 availability published on March 18th stated that the BO  
16 is available and gave a URL website at that time;  
17 however, the document is not located at that website.

18           In its response, Ms. Graham noted that the URL  
19 link was included in the availability merely to share  
20 where the document would be posted. We've checked every  
21 day. The document is still not posted to that site.

22           We've also asked directly the Fish and  
23 Wildlife Service for the document and been denied access  
24 from Fish and Wildlife Service as well.

25           The document is an integral part of this

1 Environmental Impact Statement, and to provide the  
2 public a meaningful opportunity to review and comment on  
3 the EIS, we need that document, and we think it should  
4 be made public immediately and that we should be given  
5 access to the document immediately.

26 Second, in our March 31st letter we also  
7 requested the IMPLAN model utilized to analyze the  
8 socioeconomic and consequences of the five alternatives  
9 listed in the Draft EIS.

10 In response, again, Ms. Graham noted that the  
11 IMPLAN model and data are proprietary and that the  
12 output and input were adequately described in the Draft  
13 EIS.

14 We don't argue that the IMPLAN software is  
15 proprietary as listed on IMPLAN's website, and we may  
16 need to purchase software to access the model. We're  
17 fine doing so. That's not the issue here. The issue is  
18 there are assumptions made in that model that cannot be  
19 reviewed in a meaningful manner without access to the  
20 model utilized in the Draft EIS.

21 Merely listing the outputs and inputs put into  
22 the model doesn't provide adequate analysis capability  
23 of the various assumptions that go into any sort of  
24 economic model like IMPLAN.

25 Again, the model's integral to any meaningful

1 review of the Draft EIS and should be utilized by the  
2 public immediately.

3           And finally I'll just include -- I won't go  
4 into these in depth -- based on our initial review of  
5 the hydrologic model, we have five more additional  
6 information requests that weren't included in the Draft  
7 EIS or the documents we've seen following.

8           So again, thank you for allowing me to make  
9 these comments on behalf of the Interstate Stream  
10 Commission, and we look forward to your response to this  
11 and any ongoing response to our March 31st letter as  
12 well. Thank you.

13           THE COURT: Thank you for your comments,  
14 and we appreciate that they're written as well.

15           MS. BANNERMAN: Okay. Who do I --

16           THE COURT: To the reporter. Any other  
17 comments? Well, this is going to be a barn burner.  
18 Well, we'll just wait and see who shows up next. Who's  
19 feeling --

20           Nobil, do you have anything?

21           MR. SHAFIKE: No, everything is included  
22 in the letter.

23           MS. GRAHAM: You put yes, so --

24           MR. RICH: He was just being agreeable.

25           MS. BANNERMAN: He wasn't sure if I was

1 going to cover everything he wanted.

2 (Recess was held from 4:28 to 6:53.)

3 MR. RICH: We're back on the record for  
4 the public hearing on the continued implementation of  
5 the 2008 operating agreement with the Rio Grande Project  
6 Draft Environmental Impact Statement, New Mexico and  
7 Texas.

8 We are at the end of our time, having received  
9 comments from all those who came to provide comments,  
10 and we're closing at seven o'clock.

11 (Hearing concluded at 7:00 p.m.)

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1 STATE OF NEW MEXICO )

2 )

3 COUNTY OF BERNALILLO)

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5 I, ROBIN A. BRAZIL, Certified Court Reporter for  
6 the State of New Mexico, hereby certify that I reported,  
7 to the best of my ability, the foregoing proceedings;  
8 that the foregoing is a true and correct transcript of  
9 my stenographic notes, which were reduced to typewritten  
10 transcript through Computer-Aided Transcription; that on  
11 the date I reported these proceedings, I was a New  
12 Mexico Certified Court Reporter.

13 Dated at Albuquerque, New Mexico, this 14th day of  
14 April, 2016.

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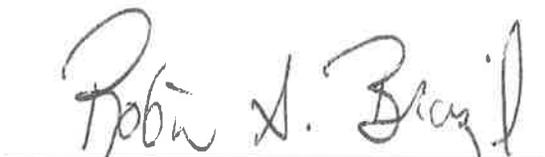
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ROBIN A. BRAZIL  
New Mexico CCR No. 154  
WILLIAMS & ASSOCIATES, LLC  
1608 Fifth Street, Northwest  
Albuquerque, New Mexico 87102

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25

# NEW MEXICO INTERSTATE STREAM COMMISSION

105

## COMMISSION MEMBERS

PHELPS ANDERSON, Chairman, Roswell  
TOM BLAINE, P.E. Secretary  
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TOPPER THORPE, Cliff



BATAAN MEMORIAL BUILDING, ROOM 101  
POST OFFICE BOX 25102  
SANTA FE, NEW MEXICO 87504-5102  
(505) 827-6160  
FAX: (505) 827-6188

To: Bureau of Reclamation Staff  
From: New Mexico Interstate Stream Commission  
Date: April 7, 2016  
Re: Information Request - Draft EIS for 2008 Operating Agreement

### Biological Opinion

1 In its March 31, 2016 letter the New Mexico Interstate Stream Commission (NMISC) requested the Biological Opinion (BO) issued by the U.S. Fish and Wildlife Service and supporting data from which the analysis in the Biological Opinion was developed. The NMISC noted that the Notice of Availability published March 18, 2016 stated that the BO is available at [http://www.fws.gov/southwest/es/NewMexico/ES\\_bio\\_op.cfm](http://www.fws.gov/southwest/es/NewMexico/ES_bio_op.cfm), however, the document was not located on the link.

In its response to the March 31, 2016 letter, Bureau of Reclamation (Reclamation) staff again failed to include the BO. The response stated that the URL link was included in the Notice of Availability merely to "share where the document *would* be posted." The document is still not posted to the given link. Moreover, the NMISC requested the BO from the U.S. Fish & Wildlife Service and was again denied access. This document is an integral part of the Draft EIS and should be released to the public immediately.

### IMPLAN Model

2 In its March 31, 2016 letter the NMISC also requested the IMPLAN model utilized to analyze the socioeconomic environmental consequences of the five alternatives, including all input and output files. Specifically the NMISC requests the model, all input and output data and files, and all post-processing files and analyses. In its response, BOR staff asserted that the IMPLAN model and data are proprietary and that the output and input were adequately described in the Draft EIS. The NMISC does not argue that the IMPLAN software is proprietary as described on their website and purchase of a software license may be necessary to run the model. That is not the issue.

The assumptions made in the model cannot be reviewed in a meaningful manner without access to the model utilized in the Draft EIS. Merely stating the outputs of the model does not allow analysis of the various assumptions that go into any economic model. Again, this model is an integral part of the Draft EIS and should be released to the public immediately.

Additional Hydrologic Model Information

3 The NMISC thanks BOR for release of the model files requested in the March 31, 2016 letter. Based on our initial review of the model the NMISC requests the following additional information related to the model:

1. Model Enhancements - All computer files, source code, and documentation for all “new features” and “enhancements” to the MODFLOW-OWHM Model that were made in developing the Rincon and Mesilla Basins Hydrologic Model (“RMBHM”), including those described in the Addendum section of Technical Memorandum No. 86-68210-2015-05, Simulation of Rio Grande Project Operations in the Rincon and Mesilla Basins: Summary of Model Configuration and Results (“RMBHM Technical Memo”) (see pages 55-58).
2. Model Calibration - All model files, input and output files, PEST input and output files, post-processing spreadsheets, statistical analyses, and documentation related to parameterization, correlation, and calibration of the RMBHM, including all comparisons of historical data and simulated data at monthly, seasonal, annual, and other time intervals. This includes comparisons that were documented in the RMBHM Technical Memo and all other available comparisons. (see pages 18-21 of the RMBHM Technical Memo).
3. Model Sensitivity Analyses - All model files, input and output files, post-processing spreadsheets, statistical analyses, and documentation related to the sensitivity analysis that were conducted using the RMBHM. (see pages 19-20 of the RMBHM Technical Memo).
4. GIS Files - All GIS files related to or used in developing the RMBHM, and displaying spatial information and results from the model.
5. Hydrologic Inputs to Model – All computer files and analyses related to all hydrology and climate inputs to the RMBHM, including (a) historical data used in calibrating the model and (b) projected future data used in the MBHM simulation runs for the 5 alternatives described in 2016 Draft EIS. This includes all of the downscaled temperature and precipitation projections from global climate models, all hydrologic modeling to develop projects of future streamflow at selected locations within the Rio Grande Basin, including analyses performed with the Upper Rio Grande Simulation Model (URGSiM) (see pages 22 – 28 of the RMBHM Technical Memo)

Again the NMISC asks you please provide all the requested information in electronic format, if available, to Kim Bannerman at kim.bannerman@state.nm.us. If you do not have the information electronically, please send a hard copy to her at the address listed above.

Thank you for your time and attention.

CONTINUED IMPLEMENTATION OF THE 2008 OPERATING  
AGREEMENT FOR THE RIO GRANDE PROJECT, DRAFT  
ENVIRONMENTAL IMPACT STATEMENT, NEW MEXICO and TEXAS

TRANSCRIPT OF PROCEEDINGS

Public Hearing to Receive  
Oral, Written Comments

April 12, 2016  
6:00 p.m.  
Elephant Butte Irrigation District Board Room  
530 South Melendres Street  
Las Cruces, New Mexico 88005

REPORTED BY: HEATHER PITVOREC, RMR  
NM CCR 506, TX CSR 9030  
WILLIAMS & ASSOCIATES, LLC  
1608 Fifth Street NW  
Albuquerque, NM 87102

A P P E A R A N C E S

Hearing Officer: JOSHUA MANN

Attendee for U.S. Department of the Interior, Bureau of Reclamation:

RHEA LYDIA GRAHAM  
555 Broadway Boulevard NE  
Suite 100 (ALB-103)  
Albuquerque, New Mexico 87102  
rgraham@usbr.gov

Attendee for Environmental Management and Planning Solutions, Inc.

KEVIN T. DOYLE  
54 1/2 Lincoln Street  
Santa Fe, New Mexico 87501  
kevin.doyle@empsi.com

Attendees for Public Hearing:

Phil King  
Zack Libbin  
Erek H. Fuchs  
Jennifer Faler  
Michelle Estrada Lopez  
Dale Doremus  
Pamela Homer  
Marcy Driggers  
Blane Sanchez  
Nathalie Jacque  
Dave Henney  
Gill Sorg

## 1 P R O C E E D I N G S

2  
3 HEARING OFFICER: Okay. I guess we can  
4 get started. It's past 6:00, and Rhea informs me  
5 that there is nobody coming in. I think we're it  
6 for now, anyways.

7 Good evening and welcome to the Public  
8 Hearing on the Continued Implementation of the 2008  
9 Operating Agreement for the Rio Grande Project,  
10 Draft EIS, New Mexico and Texas.

11 My name is Josh Mann. I'm the hearing  
12 examiner. I'm with the Solicitor's Office in  
13 Albuquerque. I'm here to receive your comments,  
14 which will be recorded by our court recorder.

15 The hearing is not for answering questions  
16 or holding dialogue with staff. The purpose of the  
17 hearing is to receive and record your comments on  
18 the subject matter of the draft EIS or -- yeah,  
19 Draft Environmental Impact Statement or EIS.

20 We also accept written comments at this  
21 hearing. The purpose of today's public hearing is  
22 to take your comments regarding the Draft EIS. This  
23 public hearing is in the Board Room at Elephant  
24 Butte Irrigation District located at 530 South  
25 Melendres Street in Las Cruces, New Mexico.

1           The U.S. Environmental Protection Agency  
2 has given EIS No. 20160063 to this draft EIS.  
3 Comments are due by May 9th, 2016, to Rhea Graham of  
4 the Bureau of Reclamation. Her E-mail address is  
5 Rgraham@USBR.gov, that's R-G-R-A-H-A-M at U-S-B-R  
6 dot gov should you wish to provide additional  
7 written comments after today's hearing.

8           I will take your comments in the order  
9 that you signed in. However, nobody at this point  
10 has stated that they want to make any comments.

11           So you'll notice that the document has  
12 line numbers. Referring to the page number and line  
13 numbers will be helpful when you're responding to  
14 comments.

15           And so, because we don't have anybody that  
16 has said they want to make comments, I suggest that  
17 we go off the record until somebody comes in who  
18 does want to provide comments.

19           That way, you don't have to record all of  
20 our chatter, and we can talk.

21           So we'll go off the record now.

22           (A discussion was held off the record.)

23           HEARING OFFICER: So we're back on the  
24 record. It is 9:00, and we're here for a public  
25 hearing on the Continued Implementation of the 2008

1 Operating Agreement for the Rio Grande Project,  
2 Draft Environmental Impact Statement, New Mexico and  
3 Texas.

4           We did not receive any comments today.  
5 There were no commentators, no comment-ors rather,  
6 and we have filled our obligation. We will now  
7 conclude this hearing.

8           Off the record.

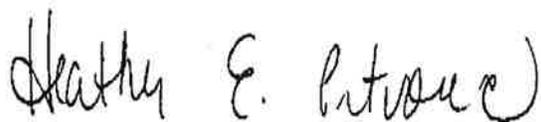
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10           (The proceedings concluded at 9:00 PM.)  
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1 CONTINUED IMPLEMENTATION OF THE 2008 OPERATING  
2 AGREEMENT FOR THE RIO GRANDE PROJECT, DRAFT  
3 ENVIRONMENTAL IMPACT STATEMENT, NEW MEXICO and TEXAS  
4

5 REPORTER'S CERTIFICATE  
6

7 I, HEATHER E. PITVOREC, New Mexico CCR  
8 #506, DO HEREBY CERTIFY that on April 12, 2016,  
9 proceedings in the above-captioned matter were taken  
10 before me, that I did report in stenographic  
11 shorthand the proceedings set forth herein, and the  
12 foregoing pages are a true and correct transcription  
13 to the best of my ability.

14 I FURTHER CERTIFY that I am neither  
15 employed by nor related to nor contracted with  
16 (unless excepted by the rules) any of the parties or  
17 attorneys in this case, and that I have no interest  
18 whatsoever in the final disposition of this case in  
19 any court.

20 

21 Heather E. Pitvorec  
22 Heather E. Pitvorec, RPR, RMR,  
23 Certified Court Reporter No. 506  
24 License Expires: 12/31/2016  
25



Graham, Rhea &lt;rgraham@usbr.gov&gt;

## Draft EIS Information Request

**Bannerman, Kim, OSE** <Kim.Bannerman@state.nm.us>

Wed, Apr 13, 2016 at 5:17 PM

To: "Graham, Rhea" &lt;rgraham@usbr.gov&gt;, ADMIN RECORD &lt;RGOA\_EIS@empfi.net&gt;

Cc: "Doremus, Dale, OSE" &lt;dale.doremus@state.nm.us&gt;, "Schmidt, Rolf I., OSE" &lt;rolf.schmidt@state.nm.us&gt;

Rhea,

1 I just finished speaking with Dale Doremus who I understand you spoke with last night at the public hearing. It sounds like you have not adequately reviewed the information request we made last week.

My statements last week at the public hearing, as well as the written comments I submitted, are abundantly clear that we need more information than what you have already provided us. My comments specifically stated that we were thankful for what you had already provided, but we need additional information in order to do an adequate review.

The comments are attached. Please provide the additional information we have requested in a timely fashion.

Please also notify me of the date the Biological Opinion will be available on the website you listed in the Notice of Availability.

Best,

Kim Bannerman

Attorney

New Mexico Interstate Stream Commission

PO Box 25102

Santa Fe, NM 87504-5102

Phone: (505) 827-4004

Fax No. (505) 476-0399

Email: [kim.bannerman@state.nm.us](mailto:kim.bannerman@state.nm.us)

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**Comments Submitted at Public Hearing 040716.doc**  
56K



Graham, Rhea &lt;rgraham@usbr.gov&gt;

## Rio Grande DEIS Extension Request

**Bannerman, Kim, OSE** <Kim.Bannerman@state.nm.us>

Mon, Apr 18, 2016 at 12:06 PM

To: "Graham, Rhea" &lt;rgraham@usbr.gov&gt;, ADMIN RECORD &lt;RGOA\_EIS@empsi.net&gt;

Cc: "Dixon, Deborah, OSE" &lt;Deborah.Dixon@state.nm.us&gt;, "Haas, Amy, OSE" &lt;amy.haas@state.nm.us&gt;, "Jay F. Stein" &lt;jfstein@newmexicowaterlaw.com&gt;, "Doremus, Dale, OSE" &lt;dale.doremus@state.nm.us&gt;, Jennifer Faler &lt;jfaler@usbr.gov&gt;, "Schmidt, Rolf I., OSE" &lt;rolf.schmidt@state.nm.us&gt;

Ms. Graham,

- 1 Will you please update us on the status of our request for an extension of the May 9<sup>th</sup> deadline for comments. As you will recall, we asked for a 90 day extension to August 7<sup>th</sup>.

- 2 Also, at the April 7<sup>th</sup> public hearing the NMISC requested additional information, both in writing and through oral comments. I followed up on that request with an email to you on Wednesday, April 13<sup>th</sup>. To date we have not received any of the additional items requested. As I have already made clear, the NMISC cannot conduct a meaningful review of the Draft EIS without this information. The fact the comment deadline is so soon and Reclamation has not provided us with the information necessary to review the document is further support for granting the comment extension.

Please update me as soon as possible on these items.

Kim Bannerman

Attorney

New Mexico Interstate Stream Commission

PO Box 25102

Santa Fe, NM 87504-5102

Phone: (505) 827-4004

Fax No. (505) 476-0399

Email: [kim.bannerman@state.nm.us](mailto:kim.bannerman@state.nm.us)

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Graham, Rhea &lt;rgraham@usbr.gov&gt;



## Extension Request Follow Up

**Bannerman, Kim, OSE** <Kim.Bannerman@state.nm.us>

Wed, Apr 20, 2016 at 11:45 AM

To: "Graham, Rhea" &lt;rgraham@usbr.gov&gt;, ADMIN RECORD &lt;RGOA\_EIS@emp.si.net&gt;

Cc: "Jay F. Stein" &lt;jfstein@newmexicowaterlaw.com&gt;, "Dixon, Deborah, OSE" &lt;Deborah.Dixon@state.nm.us&gt;, "Doremus, Dale, OSE" &lt;dale.doremus@state.nm.us&gt;, "Haas, Amy, OSE" &lt;amy.haas@state.nm.us&gt;, Jennifer Faler &lt;jfaler@usbr.gov&gt;, "Schmidt, Rolf I., OSE" &lt;rolf.schmidt@state.nm.us&gt;

Ms. Graham,

I am again following up on the ISC's request for an extension to the May 9<sup>th</sup> deadline for comments on the Rio Grande Operating Agreement Draft EIS. We submitted our request for an extension nearly three weeks ago.

1

Please get back to me on the status of our request.

Kim Bannerman

Attorney

New Mexico Interstate Stream Commission

PO Box 25102

Santa Fe, NM 87504-5102

Phone: (505) 827-4004

Fax No. (505) 476-0399

Email: [kim.bannerman@state.nm.us](mailto:kim.bannerman@state.nm.us)

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**From:** Bannerman, Kim, OSE**Sent:** Monday, April 18, 2016 12:06 PM**To:** 'Graham, Rhea'; ADMIN RECORD**Cc:** Dixon, Deborah, OSE; Haas, Amy, OSE; 'Jay F. Stein'; Doremus, Dale, OSE; Jennifer Faler; Schmidt, Rolf I., OSE**Subject:** Rio Grande DEIS Extension Request

Ms. Graham,

Will you please update us on the status of our request for an extension of the May 9<sup>th</sup> deadline for comments. As you will recall, we asked for a 90 day extension to August 7<sup>th</sup>.

Also, at the April 7<sup>th</sup> public hearing the NMISC requested additional information, both in writing and through oral comments. I followed up on that request with an email to you on Wednesday, April 13<sup>th</sup>. To date we have not received any of the additional items requested. As I have already made clear, the NMISC cannot conduct a meaningful review of the Draft EIS without this information. The fact the comment deadline is so soon and Reclamation has not provided us with the information necessary to review the document is further support for granting the comment extension.

Please update me as soon as possible on these items.

Kim Bannerman

Attorney

New Mexico Interstate Stream Commission

PO Box 25102

Santa Fe, NM 87504-5102

Phone: (505) 827-4004

Fax No. (505) 476-0399

Email: [kim.bannerman@state.nm.us](mailto:kim.bannerman@state.nm.us)

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110



Graham, Rhea <rgraham@usbr.gov>

## Re: Rio Grande Project DEIS Comment Deadline

Jen Pelz <jpelz@wildearthguardians.org>  
To: "Graham, Rhea" <rgraham@usbr.gov>  
Cc: Jennifer Faler <jfaler@usbr.gov>

Wed, May 4, 2016 at 12:14 PM

Hi Rhea,

1 I am writing to request that Reclamation extend the comment deadline for the March 2016 DEIS regarding continued implementation of the 2008 OA for the RG Project and San Juan-Chama storage in Elephant Butte.

The basis for the request is that the January 21, 2016 Biological Opinion of the Service for the Project although completed has not been released to the public (at least according to our conversation earlier this week and the USFWS website containing all the recently issued Biological Opinions in New Mexico). The DEIS at page 5-4 references the forthcoming Biological Opinion, but says "[i]n a memorandum dated February 19, 2016, Reclamation requested an extension until March 22, 2016, to review the Biological Opinion prepared by the Service." Clearly, this deadline for review of and release of the Biological Opinion has come and gone.

After reviewing the DEIS and the correspondence included in Appendix D, it is clear that Reclamation believes that the Project "may affect and likely to adversely effect" the Southwestern willow flycatcher and "may affect, but not likely to adversely affect" the Rio Grande silvery minnow. The Biological Opinion of the Service will help inform Guardians' comments (as well as others).

We ask that you extend the comment deadline on the DEIS for an additional 45 days from when the BO is released to the public. We believe that the folks commenting on the DEIS (including Guardians) should all have an opportunity—the same opportunity the Service provided to Reclamation—to review the Biological Opinion prior to providing our comments on the DEIS.

Thank you for your consideration,  
Jen



JEN PELZ  
WILD RIVERS PROGRAM DIRECTOR

jpelz@wildearthguardians.org  
303-884-2702

Follow @jen\_pelz

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www.wildearthguardians.org

*"To be whole. To be complete. Wildness reminds us what it means to be human, what we are connected to rather than what we are separate from."*

– Terry Tempest Williams





Coulam, Nancy &lt;ncoulam@usbr.gov&gt;

**Re: Rio Grande Project DEIS Comment Deadline**

2 messages

Jen Pelz &lt;jpelz@wildearthguardians.org&gt;

Thu, May 5, 2016 at 9:18 AM

To: "Graham, Rhea" &lt;rgraham@usbr.gov&gt;

Cc: Nancy Coulam &lt;ncoulam@usbr.gov&gt;, Jennifer Faler &lt;jfaler@usbr.gov&gt;, Ken Rice &lt;krice@usbr.gov&gt;, Mary Carlson &lt;mcarlson@usbr.gov&gt;

Rhea,

Thank you so much for the notice. We also really appreciate the comment deadline extension.

1 Nancy--Do you know when the Biological Opinion will be released to the public?

Thanks,  
Jen

On Thu, May 5, 2016 at 9:09 AM, Graham, Rhea &lt;rgraham@usbr.gov&gt; wrote:

Jen,

See attached press release and Federal Register notice regarding extension of comment period and change of contact person for the Draft EIS.

Rhea &amp; Nancy

Rhea Graham, Special Project Officer

Bureau of Reclamation Albuquerque Area Office

555 Broadway N.E., Suite 100, Mail Stop ALB-103

Albuquerque, NM 87102

(505) 462-3560 (Office) (505) 221-0470 (Mobile) (505) 462-3793 (Fax)

<http://www.usbr.gov/uc/albuq/rm/RGP/>

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 Follow @jen\_pelz

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Graham, Rhea &lt;rgraham@usbr.gov&gt;

## Extension Request Follow Up

**Bannerman, Kim, OSE** <Kim.Bannerman@state.nm.us>

Thu, May 5, 2016 at 9:33 AM

To: Nancy Coulam &lt;ncoulam@usbr.gov&gt;

Cc: ADMIN RECORD &lt;RGOA\_EIS@emp.si.net&gt;, "Jay F. Stein" &lt;jfstein@newmexicowaterlaw.com&gt;, "Dixon, Deborah, OSE" &lt;Deborah.Dixon@state.nm.us&gt;, "Doremus, Dale, OSE" &lt;dale.doremus@state.nm.us&gt;, "Haas, Amy, OSE" &lt;amy.haas@state.nm.us&gt;, Jennifer Faler &lt;jfaler@usbr.gov&gt;, "Schmidt, Rolf I., OSE" &lt;rolf.schmidt@state.nm.us&gt;, "Graham, Rhea" &lt;rgraham@usbr.gov&gt;

Nancy,

Thank you for the email. I saw this in the Federal Register this morning.

We have still not received any response to our request for additional information made nearly a month ago, on April 7<sup>th</sup>. I followed up on that request April 13<sup>th</sup> and again on April 18<sup>th</sup>. Without this requested information we cannot conduct a meaningful review of the Draft EIS. I've attached our request again here.

1

With only a 30 day extension it is imperative that we receive this information within the next week to allow us time to review.

Kim Bannerman

Attorney

New Mexico Interstate Stream Commission

PO Box 25102

Santa Fe, NM 87504-5102

Phone: (505) 827-4004

Fax No. (505) 476-0399

Email: [kim.bannerman@state.nm.us](mailto:kim.bannerman@state.nm.us)

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**From:** Graham, Rhea [mailto:[rgraham@usbr.gov](mailto:rgraham@usbr.gov)]

**Sent:** Thursday, May 05, 2016 9:18 AM

**To:** Bannerman, Kim, OSE; Nancy Coulam

**Cc:** ADMIN RECORD; Jay F. Stein; Dixon, Deborah, OSE; Doremus, Dale, OSE; Haas, Amy, OSE; Jennifer Faler; Schmidt, Rolf I., OSE

**Subject:** Re: Extension Request Follow Up

Kim,

In response to your request(s), attached are the press release and Federal Register notice regarding extension of the comment period and change of contact person.

Rhea & Nancy

Rhea Graham, Special Project Officer

Bureau of Reclamation Albuquerque Area Office

555 Broadway N.E., Suite 100, Mail Stop ALB-103

Albuquerque, NM 87102

(505) 462-3560 (Office) (505) 221-0470 (Mobile) (505) 462-3793 (Fax)

<http://www.usbr.gov/uc/albuq/rm/RGP/>

On Wed, Apr 20, 2016 at 11:45 AM, Bannerman, Kim, OSE <[Kim.Bannerman@state.nm.us](mailto:Kim.Bannerman@state.nm.us)> wrote:

Ms. Graham,

I am again following up on the ISC's request for an extension to the May 9<sup>th</sup> deadline for comments on the Rio Grande Operating Agreement Draft EIS. We submitted our request for an extension nearly three weeks ago.

Please get back to me on the status of our request.

Kim Bannerman

Attorney

New Mexico Interstate Stream Commission

PO Box 25102

Santa Fe, NM 87504-5102

Phone: (505) 827-4004

Fax No. (505) 476-0399

Email: [kim.bannerman@state.nm.us](mailto:kim.bannerman@state.nm.us)

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**From:** Bannerman, Kim, OSE  
**Sent:** Monday, April 18, 2016 12:06 PM  
**To:** 'Graham, Rhea'; ADMIN RECORD  
**Cc:** Dixon, Deborah, OSE; Haas, Amy, OSE; 'Jay F. Stein'; Doremus, Dale, OSE; Jennifer Faler; Schmidt, Rolf I., OSE  
**Subject:** Rio Grande DEIS Extension Request

Ms. Graham,

Will you please update us on the status of our request for an extension of the May 9<sup>th</sup> deadline for comments. As you will recall, we asked for a 90 day extension to August 7<sup>th</sup>.

Also, at the April 7<sup>th</sup> public hearing the NMISC requested additional information, both in writing and through oral comments. I followed up on that request with an email to you on Wednesday, April 13<sup>th</sup>. To date we have not received any of the additional items requested. As I have already made clear, the NMISC cannot conduct a meaningful review of the Draft EIS without this information. The fact the comment deadline is so soon and Reclamation has not provided us with the information necessary to review the document is further support for granting the comment extension.

Please update me as soon as possible on these items.

Kim Bannerman

Attorney

New Mexico Interstate Stream Commission

PO Box 25102

Santa Fe, NM 87504-5102

Phone: (505) 827-4004

Fax No. (505) 476-0399

Email: [kim.bannerman@state.nm.us](mailto:kim.bannerman@state.nm.us)

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**Comments Submitted at Public Hearing 040716.doc**  
56K



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**  
**Region 6**  
**1445 Ross Avenue, Suite 1200**  
**Dallas, TX 75202-2733**

May 9, 2016

Rhea Graham  
Bureau of Reclamation, Albuquerque Area Office  
555 Broadway NE, Suite 100, Mail Stop ALB-103  
Albuquerque, NM 87102

**Re: Comment Letter for the Draft Environmental Impact Statement for the Continued Implementation of the 2008 Operating Agreement for the Rio Grande Project, along the Rio Grande River in New Mexico, Texas, and Mexico.**

In accordance with our responsibilities under Section 309 of the Clean Air Act (CAA), the National Environmental Policy Act (NEPA), and the Council on Environmental Quality (CEQ) regulations for implementing NEPA, the U.S. Environmental Protection Agency (EPA) Region 6 office in Dallas, Texas, has completed its review of the Bureau of Reclamation Draft Environmental Impact Statement (Draft EIS) for the Continued Implementation of the 2008 Operating Agreement for the Rio Grande Project. The purpose of the project is to meet contractual obligations while complying with applicable law concerning water allocation, delivery, and accounting. A Federal decision is needed to decide whether to continue operations of the Rio Grande Project through 2050, and whether to allow the storage of San Juan-Chama Project Water in Elephant Butte Reservoir.

EPA's review identified some potential adverse impacts to agricultural resources. For these reasons we have rated the Draft EIS as "Environmental Concerns – Adequate" (EC-1). The EPA's Rating System Criteria can be found at <http://www.epa.gov/compliance/nepa/comments/ratings.html>. EPA recommends that the issues be addressed in the Final EIS. We have enclosed detailed comments which clarify our concerns.

EPA appreciates the opportunity to review the Draft EIS. Please send our office one copy of the Final EIS when it is electronically filed with the Office of Federal Activities. If you have any questions or concerns, please contact Magda Dallemagne of my staff at (214) 665-7396 or by e-mail at [dallemagne.magdeleine@epa.gov](mailto:dallemagne.magdeleine@epa.gov).

Sincerely,

Robert Houston  
Chief, Special Projects Section

Enclosures

**DETAILED COMMENTS ON THE  
U.S. DEPARTMENT OF THE INTERIOR  
BUREAU OF RECLAMATION  
DRAFT ENVIRONMENTAL IMPACT STATEMENT  
FOR THE CONTINUED IMPLEMENTATION OF THE 2008 OPERATING  
AGREEMENT FOR THE RIO GRANDE PROJECT**

**BACKGROUND:** The Continued Operations of the Rio Grande Project consists of altering the operational methods, water movement, and general annual allocation of the Rio Grande Project waters through New Mexico, Texas, and finally through Mexico. No construction is involved in any of the alternatives

**WETLANDS**

The Draft EIS provides impact summaries of all alternatives, including the no action alternative, in which anticipated effects are discussed. These summaries expect some net loss of riparian vegetation at Elephant Butte Reservoir, indicate negligible impacts on river discharges from reservoirs in the non-irrigation season, and anticipate none to minor negative impacts on aquatic resources.

1 All alternatives, including the no action alternative, mentioned in the Draft EIS have minor impacts to the aquatic ecosystems, and appear to be within the range on normal annual fluctuations based on climate and rainfall variations. Potential impacts to wetlands are not specifically discussed. Since they are most likely to coincide with the riparian zone, which is discussed, it is likely that any wetlands impacts would fall within the category of minor impacts and be within the range of normal annual fluctuation. Occasionally there are springs or other small local wetland areas outside the riparian corridor that might be affected by alterations to riverine hydrology. It is not known if this type of local wetland was searched for during the review process, the concept was not addressed.

Overall, we do not expect that the proposed action would significantly change the current status of the aquatic resource. These impacts to will depend on river flows and reservoir levels. The changes to these levels resulting from the selected alternative, or any of the evaluated alternatives, are expected to be negligible and within the normal annual fluctuations based on climate and annual rainfall variations.

*Recommendations:*

- Investigate whether or not springs and other small local wetlands are located within the range of normal annual fluctuation. Include any impacts associated with the proposed alternatives, including the no action alternative, in the Final EIS.

## AGRICULTURE

- 2 The model descriptions and impact summaries found in the Draft EIS do not provide adequate information and detail in regards to the agricultural impact of the project. The impact of population growth on water use versus the impact of reduction in agriculture water consumption on crops and cropping areas is not adequately discussed. Whether urban or agricultural use will have priority is uncertain, and the environmental impact of the priority is not discussed. The environmental impact as a result of the effect of surface water reduction on ground water consumption is not explained adequately. The model also fails to address water loss adequately, from natural flow to evaporation, and the impacts therein. In short, the Draft EIS fails to adequately address agricultural issues and impact associated with this project.
- 3
- 4

### *Recommendations:*

- 5
- Include a more in-depth discussion of the agricultural impacts associated with the proposed alternatives, including the no action alternative, in the Final EIS.
  - If necessary, conduct a more intensive investigation into the aforementioned issues to provide information for a larger discussion on this topic.

## ENVIRONMENTAL JUSTICE

The Draft EIS demonstrates adequate and appropriate process for Tribal and Environmental Justice Analysis. As there were no Indian Trust Assets identified relative to any of the project alternatives, the implementation of any of the proposed alternatives, including the no action alternative, would have no impact on Indian Trust Assets. The Bureau of Reclamation determined that there would be no adverse impact on the use of native plants for traditional tribal practices by Native Americans, even though the Federal actions could result in disturbance to these native plants along area canals.

No construction is authorized under any alternatives, including the no action alternative; therefore, no direct impacts, such as from dust, noise, or disturbance, would occur on identified minority or low-income population. Based on the Bureau of Reclamation analysis, no disproportionate adverse impacts would occur on minority or low-income populations relative to this project.

### *Recommendations:*

- 6
- Make a concise summary of indirect, direct, and cumulative impacts, including “may affect and is likely to adversely affect” of the preferred alternative or alternative of choice would have on the respective minority population accessible to the public.





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Coulam, Nancy &lt;ncoulam@usbr.gov&gt;

**RE: Las Cruces Follow Up**

1 message

Jay F. Stein &lt;jfstein@newmexicowaterlaw.com&gt;

Wed, May 11, 2016 at 10:20 AM

To: Nancy Coulam <ncoulam@usbr.gov>, Jorge Garcia <JAG@las-cruces.org>, Marcy Driggers <marcyd@las-cruces.org>, "James C. Brockmann" <jcbrockmann@newmexicowaterlaw.com>, "lwa@lwasf.com" <lwa@lwasf.com>

Cc: ADMIN RECORD <RGOA\_EIS@empfi.net>, "Dixon, Deborah, OSE" <Deborah.Dixon@state.nm.us>, "Doremus, Dale, OSE" <dale.doremus@state.nm.us>, "Haas, Amy, OSE" <amy.haas@state.nm.us>, Jennifer Faler <jfaler@usbr.gov>, "Schmidt, Rolf I., OSE" <rolf.schmidt@state.nm.us>, "Graham, Rhea" <rgraham@usbr.gov>, "Bannerman, Kim, OSE" <Kim.Bannerman@state.nm.us>

Nancy -

Our firm represents the City of Las Cruces in preparing comments to the dEIS on the Operating Agreement for the Rio Grande Project.

We appreciate the extension of time to present comments, but are writing to join once again in the New Mexico Interstate Stream Commission's request for information of April 7<sup>th</sup>; renewed on April 13<sup>th</sup>, April 18<sup>th</sup>, and May 5<sup>th</sup>. We concur that without the requested information (resubmitted by Kim Bannerman on May 5<sup>th</sup>), a comprehensive and complete review of the issues as secured to commenters by NEPA will not have been possible.

1 We request that the information requested by the ISC be provided without delay.

Thank you for your attention to this matter.

Jay F. Stein, Esq.

Stein &amp; Brockmann, P.A.

P.O. Box 2067

Santa Fe, NM 87504-2067

505.983.3880

505.986.1028 (fax)



6/1/2016

Record of Call

From: James M. Speer Jr., Counsel for EPCWID

To: Nancy Coulam

RE: Comments on Draft EIS and Biological Opinion for Rio Grande Project Operating Agreement

1

Mr. Speer called with two concerns: 1) the biological opinion issued by the U.S. Fish and Wildlife Service indicated the action area included the Middle Rio Grande Project Area when it should be restricted to the Rio Grande Project area. He stated that the draft EIS had text and figures that indicated the effects of the OA extended upstream—north of Elephant Butte.

I indicated that the Service's concern was due to the broader management unit for the Southwest willow flycatcher, but that Reclamation's action area was restricted to just the RGP. I would check the text and figures and see if corrections are needed.

2

2) The term allocation throughout the draft EIS is not correct. The two districts agreed to divide the project water, first in 1938 and then in more recent years. He does not agree that Reclamation is "allocating" although a function of the OA is to divide the waters between the districts.

I said I would have Bert Cortez and others check this language in the EIS and see if it should be revised.





Coulam, Nancy &lt;ncoulam@usbr.gov&gt;

**Re: Biological Opinion Received--Extension of Comment Deadline 45 days**

1 message

Jen Pelz &lt;jpelz@wildearthguardians.org&gt;

Fri, Jun 3, 2016 at 12:36 PM

To: "Coulam, Nancy" &lt;ncoulam@usbr.gov&gt;

Cc: Kevin Doyle &lt;kevin.doyle@empsi.com&gt;, Hector Garcia &lt;hgarcia@usbr.gov&gt;, Jennifer Faler &lt;jfaler@usbr.gov&gt;

Nancy,

Thank you for sending me the final biological opinion for the RG Project Operating Agreement and San Juan-Chama Storage Project.

I am writing to request that Reclamation extend the comment deadline for the RG Project DEIS to 45 days from when the Biological Opinion was released to the public to July 15, 2016. As you know, the Biological Opinion for the project was finalized and dated May 25, 2016. I received a copy via email on May 31, 2016.

1

This document contains critical information about the impacts of the project on the Southwestern willow flycatcher and yellow-billed cuckoo. I believe that it is unfair to ask the public to review this document and provide comments to Reclamation in 8 days (6 of which are business days), when it took Reclamation four months to review and comment on a prior draft of the opinion of the Service dated January 21, 2016.

I originally made this request on May 4, when it became apparent that the Biological Opinion would not be released before the original comment deadline expired and suggested 45 days from the date of release of the Biological Opinion. I have included my prior email for your reference. While we appreciate the initial extension until June 8, we believe the public deserves, just like the agency, to have all of the relevant materials and adequate time to evaluate a project of this scope.

I appreciate you considering my proposal, please let me know if you have any questions. I can be reached at 303-884-2702.

Thank you,

Jen Pelz  
Wild Rivers Program Director  
WildEarth Guardians  
jpelz@wildearthguardians.org  
303-884-2702

----- Forwarded message -----

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Date: Wed, May 4, 2016 at 12:14 PM

Subject: Re: Rio Grande Project DEIS Comment Deadline

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Thank you for your consideration,  
Jen

On Tue, May 31, 2016 at 10:31 AM, Coulam, Nancy <[ncoulam@usbr.gov](mailto:ncoulam@usbr.gov)> wrote:  
Dear Ms. Pelz,

I am attaching the biological opinion of the Service for the continued operation of the Rio Grande Project operating agreement, per your request.

Nancy Coulam  
environmental compliance officer  
801-524-3684



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1 message

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Wild Rivers Program Director  
WildEarth Guardians  
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Subject: Re: Rio Grande Project DEIS Comment Deadline

To: "Graham, Rhea" &lt;rgraham@usbr.gov&gt;

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Nancy Coulam  
environmental compliance officer  
801-524-3684



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– Terry Tempest Williams



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Coulam, Nancy &lt;ncoulam@usbr.gov&gt;

**Request for Extension to submit comments to**

1 message

**Bardwell, Beth** <bbardwell@audubon.org>  
To: "ncoulam@usbr.gov" <ncoulam@usbr.gov>  
Cc: "Jennifer Faler (jfalere@usbr.gov)" <jfalere@usbr.gov>

Wed, Jun 8, 2016 at 10:59 AM

Dear Ms. Coulam:

1 I am writing to request an extension to submit comments to the Rio Grande Project Draft EIS. The Biological Opinion on the Rio Grande Operating Agreement contains critical information about Southwestern Willow Flycatchers and Yellow-billed Cuckoo, two species that are a focus of my organization and has only been available since May 31<sup>st</sup> or roughly one week. We would appreciate an extension to allow us sufficient time to review the relevant documents and share our comments with the Bureau on this important federal water project and the associated riparian and aquatic habitat that it impacts.

Thank you so much for your consideration of this request.

Yours, Beth

Beth Bardwell  
Director of Conservation  
Audubon New Mexico  
575-418-0288 (cell)  
4850 Tobosa Rd.  
Las Cruces, NM 88011  
[nm.audubon.org](http://nm.audubon.org)





BY EMAIL TO NCOULAM@USBR.GOV

June 8, 2016

Nancy Coulam  
Bureau of Reclamation

Dear Ms. Coulam:

Please accept these comments from the Southwest Environmental Center on the *Continued Implementation of the 2008 Operating Agreement for the Rio Grande Project Draft Environmental Impact Statement*.

The Southwest Environmental Center is a nonprofit organization dedicated to restoring wildlife and habitats in the Southwest. We have been actively engaged in habitat restoration efforts along the Rio Grande in southern New Mexico for two decades. Our current La Mancha Wetland project is intended to restore riparian and aquatic habitats that have largely been eliminated due to many decades of operation of both the Rio Grande Project (RGP) and Rio Grande Canalization Project.

For all the alternatives, we are asking BOR to authorize new points of diversions for small quantities of RGP water (say, less than 20 acre-feet annually at each diversion) for habitat restoration projects. We understand that BOR does not want to consider alternatives in this EIS that include changes to existing RGP diversion points because they are not part of the Operating Agreement (OA). (DEIS-p. 2-5) However, we are requesting that additional small diversions be authorized as part of this EIS since we do not know when there will be another opportunity to make such a request. We did not have an opportunity, nor cause, to make such a request when the OA was approved in 2008. We are not aware that BOR undertakes NEPA analysis of RGP operations at other times.

We make this request for the following reasons:

- Creating a network of small (less than five acres each) refugial, off-channel aquatic habitats where fish and other aquatic organisms can survive when flows in the river are low or nonexistent during the nonirrigation season is a viable approach to reestablishing and sustaining native fish populations. This approach does not rely on year-round flows in the river to sustain fish populations, and as such, would not constitute a major disruption of RGP operations.

1  
cont.

- It is also an approach to avoiding listing of aquatic species under the federal Endangered Species Act, which would be hugely disruptive to current RGP operations. After 20 years experience with habitat restoration within the RGP, our organization is convinced that there are currently a number of potential candidates for listing within the RGP.
- However, this approach to aquatic species conservation is unlikely to work using only the existing RGP diversion points (Percha, Leasburg, etc.). The spacing and location of these diversions would require that fish travel long distances through the irrigation system to reach these refugial habitats, and vice versa to return to the river to comeingle with other populations. This is unlikely to happen. Many fish would end up flopping in pecan orchards and chile fields. Additional points of diversion will need to be established to convey RGP water (and fish) short distances between the river and refugial habitats.
- This is not an academic request. We have previously informed BOR, EBID, USIBWC and OSE of the need to seek a new point of diversion of RGP water to serve our La Mancha Wetland Project (under development).
- We understand the need to account for water diverted from these new points of diversion to comply with the OA, and fully support whatever measures are needed to achieve a level of accountability that is acceptable to BOR, USIBWC and the districts.
- However, the amount of water that would be diverted at these new points of diversions is infinitesimally small compared to overall deliveries within the RGP. Accounting for them should be quite manageable. We are aware that a number of farmers within EBID are “river pumpers” who divert RGP water directly from the river and are required to account for those diversions.
- We understand that using RGP water to support these habitat projects may require contracts negotiated under the Miscellaneous Purposes Act of 1920. However, that should not be a reason prima facie to reject new points of diversion to support these projects.

Thank you for the opportunity to comment.

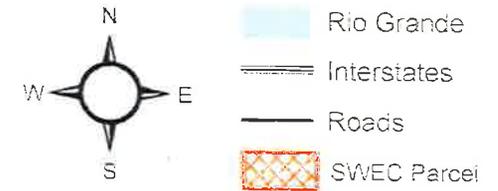
Yours,



Kevin Bixby  
Executive Director

# La Mancha Wetland Project

Map prepared by E. J. Simeoni  
at the Spatial Applications Research Center  
New Mexico State University



Las Cruces, NM



**Data Sources**  
 Dona Ana Roads: Dona Ana County 2008 Data  
 Interstates: ESRI Base Data 9/3  
 Imagery: Dona Ana County 2007 Aerials  
 Rio Grande: Spatial Applications Research Center

**Coordinate System and Projection**  
 Projection: Transverse Mercator  
 GCS: North American 1983  
 Datum: D North American 1983







Coulam, Nancy &lt;ncoulam@usbr.gov&gt;

**Re: RGP operating agreement DEIS**

1 message

**Kevin Bixby** <kevin@wildmesquite.org>  
Reply-To: kevin@wildmesquite.org  
To: "Coulam, Nancy" <ncoulam@usbr.gov>

Wed, Jun 8, 2016 at 2:37 PM

Nancy,

Please see our attached comments and acknowledge receipt.

Thanks,

Kevin

On 5/25/2016 8:29 AM, Coulam, Nancy wrote:

Hello Mr. Bixby, The comment period was extended to June 8th, which is a Wednesday. So you have until then. If there is any way you could get your comments in before then, that would be great as I am working on comment-responses now. However, if you need til the 8th, that is fine.

Nancy Coulam

On Tue, May 24, 2016 at 11:25 AM, Kevin Bixby &lt;kevin@wildmesquite.org&gt; wrote:

Are comments on the Rio Grande Project Operating Agreement DEIS now due Wednesday, June 8, or Monday, June 6? The press release says " on or before Monday, June 8, 2016" but June 8 is not a Monday.

Thanks,

--

Kevin Bixby, Executive Director  
Southwest Environmental Center  
275 North Main Street  
Las Cruces, NM 88001  
(575) 522-5552 (575) 526-7733 fax  
[www.wildmesquite.org](http://www.wildmesquite.org)

If we destroy Creation, Creation will destroy us. --Pope Francis

--

Kevin Bixby, Executive Director  
Southwest Environmental Center  
275 North Main Street  
Las Cruces, NM 88001  
(575) 522-5552 (575) 526-7733 fax  
[www.wildmesquite.org](http://www.wildmesquite.org)

If we destroy Creation, Creation will destroy us. --Pope Francis

6/8/2016

DEPARTMENT OF THE INTERIOR Mail - Re: RGP operating agreement DEIS



**BOR OA comments.docx**

682K

**ORIGINAL**



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VIA ELECTRONIC AND REGULAR MAIL

May 26, 2016

Jennifer Faler, Area Manager  
Albuquerque Area Office  
U.S. Bureau of Reclamation  
555 Broadway NE, Suite 100  
Albuquerque, NM 87102-2352

Dear Ms. Faler:

Thank you for your letter of April 26, 2016, responding to our letter dated September 10, 2015, in which you communicated your concerns about our La Mancha Wetland restoration project.

You stated that the use of our Rio Grande Project (Project) surface water for La Mancha would require us to enter into a contract with Elephant Butte Irrigation District (EBID) and Reclamation for a change of use of our existing Project water use rights under the provisions of the 1920 Miscellaneous Purposes Act. You further stated that you consulted with EBID about using our Project surface water for La Mancha, and that EBID informed you that La Mancha "would not meet the requirements for irrigation for native vegetation since it will be used for fish habitat" since EBID policy states that "No aquaculture or exposed ground water habitat is authorized."

It is our view that La Mancha, when completed as designed, will use a combination of groundwater and surface water. Groundwater is being used to supply an existing pond on SWEC's private land. The pond supports fish and other aquatic creatures. Currently, there is no surface water connection to the river. The size of the pond expands and contracts according to groundwater levels, which are affected by flows of surface water in the river and pumping by our neighbors.

We will seek a permit to divert surface water onto the site. Surface water will be conveyed via an earthen channel that will be excavated across the USIBWC floodway, into a gated concrete culvert already installed under the flood control levee, and discharged onto our private property. This surface water will be used to irrigate areas adjacent to the pond to support native trees, shrubs, hydrophytes and grasses. The addition of surface water may cause a temporary increase in the size of the pond, but only until it has a chance to sink into the ground. In effect, the pond



itself is part of the conveyance system by which we intend to deliver Project water from the river to irrigate native plants surrounding the pond.

We understand the Rio Grande Project was authorized for irrigation. Does Reclamation share EBID's view that use of our surface water for La Mancha is not an authorized use of Project water? If so, could you please explain why not? As stated, we intend to use our surface water to irrigate native plants, including some that are riparian and wetland species that may occasionally be inundated for brief periods of time.

Does Reclamation share EBID's view that the use of surface water to irrigate native vegetation is an authorized use of Project water, per EBID's Policy 2013-ENG14? If so, could you explain to us how using Project water for one type of ecological restoration project is an authorized use of Project water, but using it for another type of ecological restoration project is not? It would seem that all such projects would meet the definition of irrigation, or neither would.

Also, since your letter refers to EBID's Policy 2013-ENG14, is it your view that this policy is intended to cover all types of ecological restoration projects, or only those specifically intended to reestablish native vegetation on USIBWC property? The latter would seem to be the case, as USIBWC restoration projects are referenced in the policy as background. Furthermore, Section 1.vi. of the policy requires that projects that might attract a listed or candidate species under the Endangered Species Act must be covered by an incidental take statement that is contained within a biological opinion, conference opinion or similar document issued by the U.S. Fish and Wildlife Service, requirements that would seem to apply only to federal agencies, not private landowners.

If Reclamation believes that we must enter into a third party contract under the Miscellaneous Purposes Act, we have some questions about how that might work. For example, we already have Project water rights for the land on which La Mancha is located. Will we be required to forfeit some or all of our current Project water rights that are appurtenant to our private property? If only a portion, how much, and how will that be determined? In addition, will we be assessed additional fees by Reclamation and EBID for surface water used for La Mancha? Will we be required to pay for administrative costs associated with the contract? As a small nonprofit, any additional fees would impose a significant financial burden on us, increasing the costs of our habitat restoration projects.

In your letter, you mentioned that Reclamation and EBID have concerns about flood control issues by "having a pipe through the levee specifically designed to flow during periods of high flow in the Rio Grande Channel." As you are probably aware, this pipe was installed by USIBWC, which has flood control responsibilities for the Rio Grande Project. The pipe includes a gate to control flows through it. We fully intend to apply for a permit from USIBWC before putting this pipe into operation for La Mancha. We are certain any USIBWC-issued permit will include conditions to address flood control concerns.

Finally, you stated that the 2008 Operating Agreement requires that all deliveries of Project water will be measured and properly accounted. We have had numerous discussions with EBID



about this issue and we are fully committed to utilizing whatever methods of measuring diversions are required by EBID. When we apply to the New Mexico Office of State Engineer for a permit to change the point of diversion for our Project water, we will include language in the application stating that commitment.

We understand that our La Mancha Project is unprecedented and raises issues that have not been dealt with before, which is why we have worked diligently with Reclamation, EBID and other stakeholders over the past 10 years to make sure that we understand everyone's concerns and address them to the best of our ability. It is our hope that others will help us work through these concerns so that together we can continue to restore important ecological habitats within the Rio Grande Project.

Sincerely,

A handwritten signature in black ink, appearing to read 'Kevin Bixby', with a stylized flourish at the end.

Kevin Bixby  
Executive Director

Cc: Bert Cortez, USBR



6/8/2016

RECORD OF CALL AND FOLLOW UP EMAIL

From: Beth Bardwell, Director of Conservation, Audubon New Mexico

To: Nancy Coulam

RE: Comments on Draft EIS and Biological Opinion for Rio Grande Project Operating Agreement

1 Ms. Bardwell called to say that the draft EIS did not include sufficient consideration of the ongoing effects of the Rio Grande Project and the IBWC's Rio Grande Canalization Program on birds and riparian habitat. In particular, references were missing that indicated Reclamation had considered effects on birds and habitat based on information in the following documents:

- 2
- 1) the IBWC's Land Management Plan associated with the IBWC's Rio Grande Canalization Project, and Environmental Water Transactions Program,
  - 2) the letter dated November 9, 2011 from Reclamation to the Audubon Society regarding the conversion of Rio Grande Project irrigation water to miscellaneous purposes, including protection and conservation of birds and their habitat
  - 3) the policy of EBID and IBWC to classify native vegetation riparian habitat as water-righted acres within EBID boundaries
  - 4) the IBWC's River Management Plan of Nov. 2014.
  - 5) the Service's biological opinion (consultation No. 02ENNM00-2012-F-0016) regarding the IBWC's Integrated Land Management Alternative for Long-term Management of the Rio Grande Canalization Project, dated 2012.

These need to be included in the FEIS and Reclamation should ask IBWC (Liz VVerdecchia) for a copy of the Rio Grande Canalization Environmental Water Transaction Program Final Framework and program Report, dated 2015.





Coulam, Nancy &lt;ncoulam@usbr.gov&gt;

**USIBWC Environmental Water Transactions Program**

1 message

**Bardwell, Beth** <bbardwell@audubon.org>  
To: "ncoulam@usbr.gov" <ncoulam@usbr.gov>

Wed, Jun 8, 2016 at 11:46 AM

Hi Nancy:

Here is a lot of background on IBWC Rio Grande Canalization program including Biological Opinion and EBID Restoration Policy and Bureau of Reclamation letter authorizing water transfers to restoration sites in Rio Grande Canalization Program.

I think you would be well served to ask Liz Verdecchia for a copy of the Rio Grande Canalization Environmental Water Transactions Program Final Framework and Program Report (March 2015).

Thank you. Beth

Beth Bardwell  
Director of Conservation  
Audubon New Mexico  
575-418-0288 (cell)  
4850 Tobosa Rd.  
Las Cruces, NM 88011  
nm.audubon.org

**From:** Bardwell, Beth  
**Sent:** Wednesday, June 08, 2016 11:00 AM  
**To:** 'ncoulam@usbr.gov' <ncoulam@usbr.gov>  
**Cc:** Jennifer Faler (jfaler@usbr.gov) <jfaler@usbr.gov>  
**Subject:** Request for Extension to submit comments to

Dear Ms. Coulam:

I am writing to request and extension to submit comments to the Rio Grande Project Draft EIS. The Biological Opinion on the Rio Grande Operating Agreement contains critical information about Southwestern Willow

Flycatchers and Yellow-billed Cuckoo, two species that are a focus of my organization and has only been available since May 31<sup>st</sup> or roughly one week. We would appreciate an extension to allow us sufficient time to review the relevant documents and share our comments with the Bureau on this important federal water project and the associated riparian and aquatic habitat that it impacts.

Thank you so much for your consideration of this request.

Yours, Beth

Beth Bardwell

Director of Conservation

Audubon New Mexico

575-418-0288 (cell)

4850 Tobosa Rd.

Las Cruces, NM 88011

nm.audubon.org

---

**7 attachments**

 **2012-0016\_USIBWC\_Land\_Management\_Alternative\_Rio\_Grande\_Canalization\_Project\_August\_2012.pdf**  
1348K

 **Canalization\_Restoration\_OverviewMap\_OnePagewithrestorationsites.pdf**  
593K

 **CanalizationRestoration FACTSHEET\_JUNE2014.pdf**  
477K

 **EWTP FACTSHEET\_JUNE2014.pdf**  
422K

 **USIBWC Canalization River Management Plan - FINAL NOVEMBER 2014 (3).pdf**  
2876K

 **BureauLtr\_110911.pdf**  
847K

 **Policy\_2013\_ENG14.pdf**  
154K



## United States Department of the Interior

BUREAU OF RECLAMATION  
Upper Colorado Region  
Albuquerque Area Office  
555 Broadway NE, Suite 100  
Albuquerque, NM 87102-2352

IN REPLY REFER TO:

EP-100  
ENV-7.00

NOV 09 2011

Ms. Beth Bardwell  
Director of Freshwater Conservation  
Audubon New Mexico  
4850 Tobosa Rd.  
Las Cruces, NM 88011

Subject: Water Transfers from Irrigated Agriculture to Habitat Restoration Sites Within the Rio Grande Project

Dear Ms. Bardwell:

The Bureau of Reclamation has determined that the following parameters will apply in any form of agreement which would facilitate the conversion of Rio Grande Project irrigation water to other miscellaneous uses. The conversion would be as authorized by the U. S. Congress, on February 25, 1920, for the sale of water of a Reclamation project for miscellaneous purposes other than irrigation. [41 Stat. 451] This act provided the Secretary of the Interior, through Reclamation law, the authority to enter into contracts to supply water from any Reclamation project irrigation system for other purposes than irrigation with the following provisions:

- a). approval of such contract by the "water users association" shall be obtained first;
- b). no contract shall be entered into except upon showing that there is no other practicable source of water supply for the purpose;
- c). no water will be furnished under the contract if the delivery of such water shall be detrimental to the water service for such irrigation project; and
- d). monies derived from contract(s) shall be placed into the Reclamation fund and be credited to the project from which such water is supplied.

When it is determined by Reclamation that there is not a conversion of water from irrigation to other miscellaneous purposes, the following will apply:

- Project water will be leased or acquired from willing water rights holders;
- Habitat restoration sites will be located within EBID or EP#1 irrigation district service boundaries;
- Irrigation district service boundaries may be expanded through an EBID and/or EP#1 board approved boundary realignment process to include habitat restoration sites and

comply with existing contracts which specify limits on total Project and district acreage:

- Project water will be leased or water rights permanently acquired and transferred through a EBID or EP#1 board approved leasing, voluntary suspension and transfer or reclassification process;
- Lands from which water has been transferred shall not be irrigated or otherwise use Rio Grande Project water when the entire surface water allotment is transferred.
- The use of Rio Grande project water for enhancement and establishment of riparian and wetland habitat will be considered an agricultural use provided the water righted acreage is subject to the same rights and obligations as other water righted acreage including a pro-rata diminishment of the allocation in water-short years.

If you have any questions, please do not hesitate to contact Mr. Filiberto Cortez at 915-534-6300.

Sincerely,

A handwritten signature in black ink, appearing to read "Mike Hamman", with a long horizontal flourish extending to the right.

Mike Hamman  
Area Manager

cc: Mr. Christopher Rich  
US DOI Intermountain Region  
Office of the Solicitor  
125 South State Street, RM 6201  
Salt Lake City, UT 84138

POLICY 2013-ENG14

**POLICY SUBJECT:** Use of Project Water for Native Vegetation Habitat Restoration Sites in Elephant Butte Irrigation District.

**DATE APPROVED:** June 12, 2013

**PURPOSE:** To provide guidelines and criteria for classification of native vegetation riparian habitat as water righted acres within EBID's boundaries.

**BACKGROUND:** EBID and International Boundary and Water Commission entered into a Memorandum of Understanding to cooperatively exercise their governmental authority to promote a conservation program within the Rio Grande Canalization Project that results in restoration of native vegetation riparian habitat. Lands not previously eligible for water rights may now be reclassified as water righted lands for habitat restoration as defined here and subject to the terms of EBID Policy 2003-ENG12, as amended May 9, 2012.

**Water Righted Lands for Habitat Restoration**

1. Lands which are generally well suited for restoration of native vegetation riparian habitat shall be eligible for reclassification as EBID water-righted lands subject to the following provisions:
  - i. Lands must be capable of or have a history of growing native trees, shrubs, hydrophytes, and grasses;
  - ii. Lands may show evidence of salinization (alkalinity) provided they are generally well suited for successful cultivation of the native plants to be restored;
  - iii. Lands may show evidence of a shallow water table provided they are generally well suited for successful cultivation of the native plants to be restored;
  - iv. Lands may receive water from existing irrigation facilities or through alternative methods;
  - v. Lands must be within EBID boundaries. The boundaries may be expanded by following the process set forth by statute; and,
  - vi. Lands which may be utilized by a listed or candidate species under the Endangered Species Act must be covered at all times under an Incidental Take Statement issued by the U.S. Fish and Wildlife Service under the Endangered Species Act and contained within a Biological Opinion, Conference Opinion, or similar document issued by the Service.

2. Project water that is used to support native plant survival and growth on water-righted restoration sites shall be considered irrigation, the designated purpose of the Rio Grande Project and EBID.
3. All lands for which a restoration project increases net evapotranspiration over baseline conditions shall have EBID water rights. The baseline for calculating whether the restored plant community will increase net evapotranspiration is the pre-restoration project site condition or, if applicable, the March 2009 USIBWC Conceptual Restoration Plan, Rio Grande—Caballo Dam to American Dam, New Mexico and Texas. For sites where restoration activities increase net evapotranspiration, the entire site shall be water righted. No temporary water transfers out of these sites will be allowed but temporary water transfers in will be allowed.
4. Upon successfully satisfying land reclassification criteria, the reclassified land shall be subject to applicable fees and/or assessments on an equal basis with other EBID constituents.
5. Water-righted restoration sites will receive an equal allotment per acre with other EBID district water-righted lands, sharing pro rata in shortages as required by law. EBID water deliveries to water-righted restoration sites shall receive Project water during the same irrigation period as other EBID water righted lands as determined by the EBID Board of Directors.
6. No aquaculture or exposed groundwater habitat is authorized under this Policy.

# RESTORATION ACTIVITIES IN THE RIO GRANDE CANALIZATION PROJECT: PROJECT BRIEF JUNE 2009 - JUNE 2014

INTERNATIONAL BOUNDARY AND WATER COMMISSION, U.S. SECTION

## RESTORING THE RIO GRANDE

### The Record of Decision

In 1999, the International Boundary and Water Commission, U.S. Section (USIBWC) began a public scoping and consultation process to develop alternatives for an Environmental Impact Statement on river management of the Rio Grande Canalization Project (RGCP), the 105-mile project area from the Percha Dam near Arrey, NM downstream to the American Diversion Dam in El Paso, TX. In June 2009, after ten years of discussions with the public and stakeholders, the USIBWC signed the Record of Decision (ROD) on River Management Alternatives for the RGCP. The ROD committed the USIBWC to continuing the agency's mission of water delivery, flood control and

maintaining flood capacity while changing management practices of the Rio Grande corridor. New management practices would now include implementation of a variety of environmental improvements through the year 2019, including: phasing out grazing leases, ceasing floodplain mowing on almost 2,000 acres to develop managed grasslands, updating the river management plan, evaluating alternative channel maintenance activities,

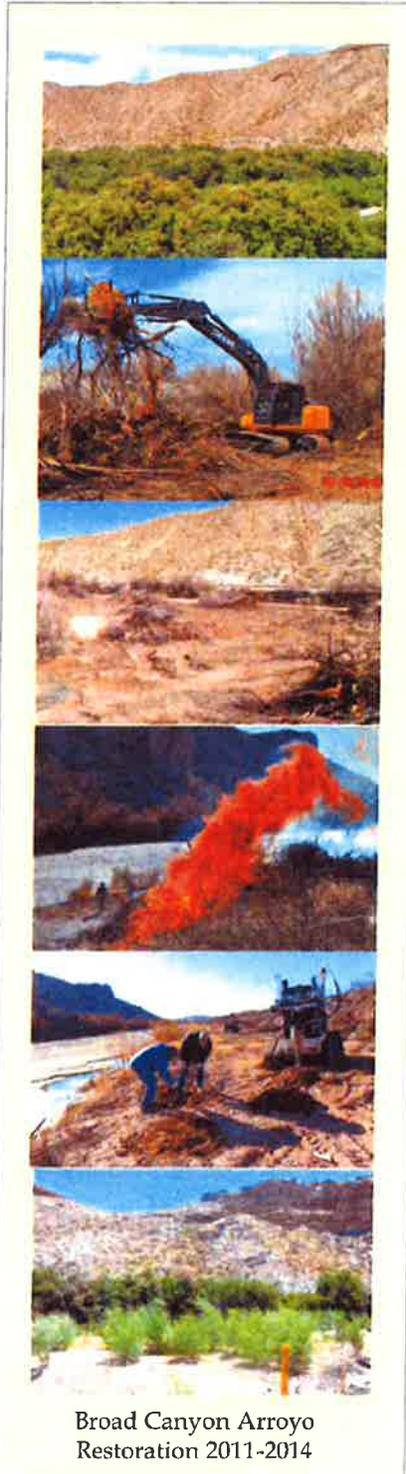
*The 2009 Record of Decision committed the USIBWC to implementing about 550 acres of habitat restoration and 2,000 acres of managed grasslands along the Rio Grande in Lower New Mexico and West Texas.*

resurveying river cross sections, implementing 30 habitat restoration sites which would restore about 550 acres of 12 habitat types, and developing

an environmental water transactions program to acquire water rights.



*On Right: Broad Canyon Arroyo Restoration:  
From top:  
Dense saltcedar August 2011;  
Saltcedar excavation March 2012;  
Post saltcedar excavation March 2012;  
Prescribed burns of saltcedar debris piles January 2013;  
Planting along the river banks February 2013; and  
Growing willow trees May 2014.*



Broad Canyon Arroyo  
Restoration 2011-2014

## Implementation of the ROD

In the first 5 years of ROD Implementation, the USIBWC and its partners have completed the following:

### Restoration Work

- Completed base studies for implementation (such as restoration plans, cultural resources investigations, soils and groundwater data, and endangered species surveys)
- From 2011 to 2014, planted almost 5,000 trees and treated or excavated about 350 acres of saltcedar on the first 9 restoration sites. Work was done by the U.S. Fish and Wildlife Service (USFWS) through an Interagency Agreement.
- Installed 55 shallow groundwater monitoring wells at 21 sites.
- Began a restoration site monitoring program.

### Environmental Water Transaction Program

- Developed an Environmental Water Transaction Program (EWTP) through a Public-Private partnership with USFWS, National Fish and Wildlife Foundation, Audubon New Mexico, and the Elephant Butte Irrigation District (EBID). The EWTP established rules and procedures for the USIBWC to acquire water and water rights through voluntary transactions to sustain restoration sites.
- USIBWC intends to acquire water rights for about 475 acres of restored habitat through voluntary transactions with willing sellers.
- Signed a Memorandum of Understanding with EBID to work collaboratively on the EWTP.
- Secured passage of an EBID policy that authorizes use of EBID-administered water for native vegetation on restoration sites.
- Identified initial willing water rights sellers, purchased surface water rights associated with 4.0 acres of land and is in the process of acquiring more.
- Created an irrigation plan for the Leasburg Extension Lateral Wasteway #8 restoration site with plans to irrigate in June 2014.
- Leased water for a second irrigation of the Leasburg restoration site in July 2014.

### Other Implementation Work

- Completed a draft River Management Plan and draft Channel Maintenance Plan in 2013 with ongoing stakeholder review.
- Consulted with the USFWS under the Endangered Species Act on possible impacts to federally endangered species, specifically the southwestern willow flycatcher. The USFWS issued a Biological and Conference Opinion in August 2012, requiring the USIBWC to maintain 53.5 acres of flycatcher habitat.
- Secured exclusion of the Lower Rio Grande from designation as critical habitat for the flycatcher because of USIBWC's commitment to a flycatcher management plan including agreements to develop a water transaction program and implementation of the overall restoration plan.
- Signed an Interagency Agreement with the U.S. Bureau of Reclamation to conduct flycatcher surveys.
- The USIBWC continues to coordinate with stakeholders (environmental groups, irrigation districts, and elected officials) through an Implementation Committee which meets about every other month.

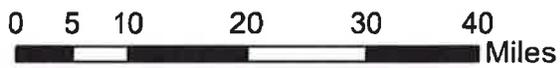
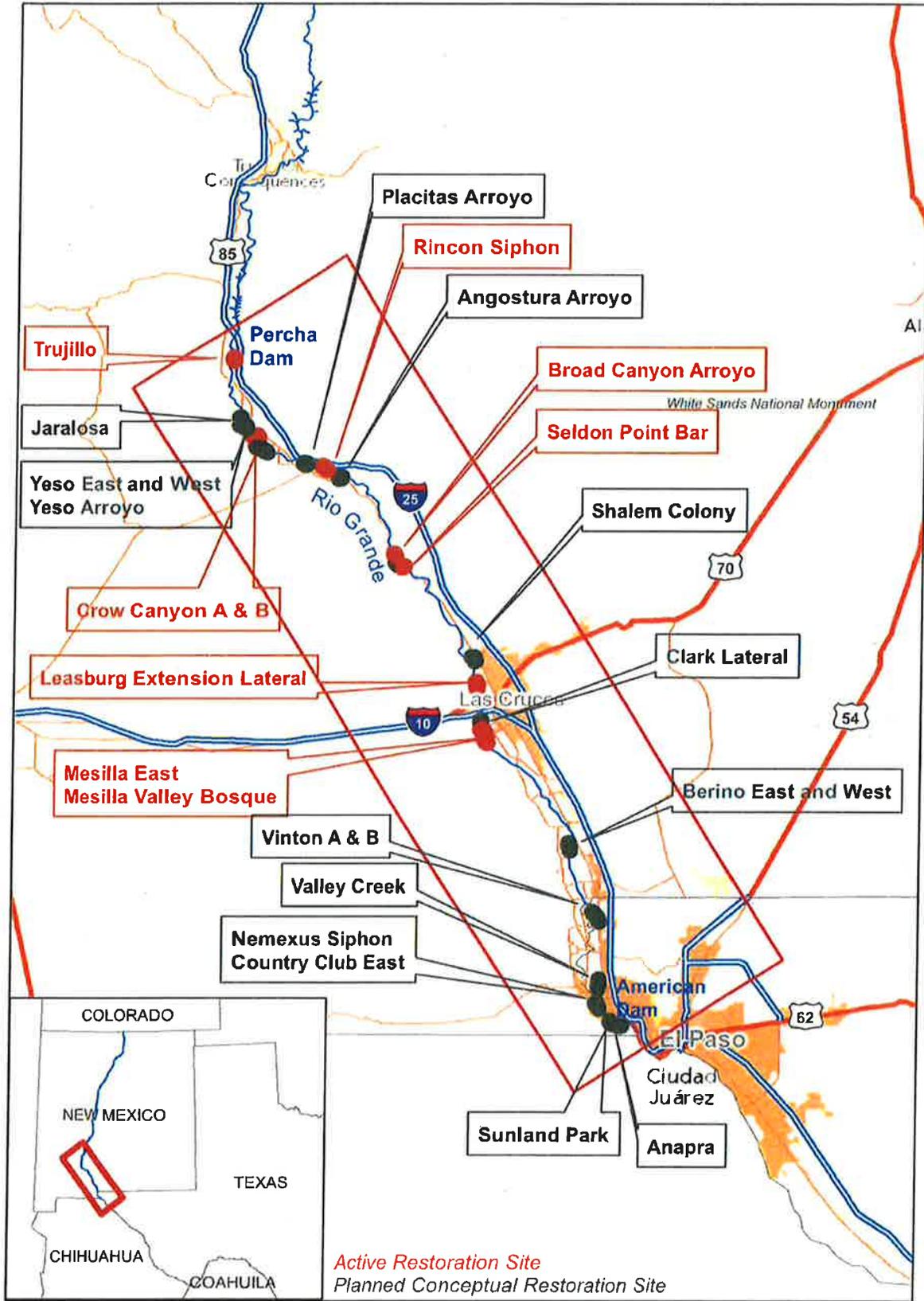
### Implementation: The Next 5 Years

- In the next 5 years, the USIBWC anticipates restoring the remaining 21 restoration sites, purchasing water rights, continuing channel maintenance discussions and studies, and finalizing the River Management Plan. The USIBWC estimates the 10-year implementation of the ROD will cost \$11.1 million. As of June 2014, \$2.6 million has been obligated or spent, representing about 23% completion.



**Leasburg Extension Lateral Wasteway #8 Restoration Work:**  
*From top: Tree planting February 2012; Blooming cottonwoods August 2012; Measuring groundwater levels July 2013; Blooming cottonwoods and willows May 2014.*

# USIBWC Rio Grande Canalization Project Habitat Restoration Sites





# RIO GRANDE CANALIZATION PROJECT ENVIRONMENTAL WATER TRANSACTIONS PROGRAM PROJECT BRIEF JUNE 2009 - JUNE 2014

INTERNATIONAL BOUNDARY AND WATER COMMISSION, U.S. SECTION

## ACQUIRING WATER TO RESTORE THE RIO GRANDE

### Background

In June 2009, the International Boundary and Water Commission, U.S. Section (USIBWC), the federal agency charged with applying the boundary and water treaties between the United States and Mexico, signed the Record of Decision (ROD) on River Management Alternatives for the Rio Grande Canalization Project (RGCP). The RGCP extends from Percha Diversion Dam in Sierra County, New Mexico 105 river miles downstream to the American Diversion Dam, in El Paso County, Texas. The ROD committed the USIBWC to implement 30 habitat restoration sites as well as to develop an Environmental Water Transactions Program (EWTP) to acquire water rights for the restoration sites.

### The Environmental Water Transactions Program

The USIBWC developed the EWTP through a Public-Private partnership with the U.S. Fish and Wildlife Service, National Fish and Wildlife Foundation,

Audubon New Mexico, and the Elephant Butte Irrigation District (EBID). The EWTP establishes rules and procedures for the USIBWC to acquire water and water rights through voluntary transactions to sustain restoration sites. USIBWC intends to acquire water rights for about 475 acres of restored habitat through voluntary transactions with willing sellers.

### Why do we need to restore native riparian habitat on the Rio Grande?

Before construction of the Canalization Project, the floodplain was a mosaic of riparian habitats including riparian forests, open woodlands, wet meadows, grasslands, and dense riparian shrub.

© Photo by Adriel Heisey



*Seldon Point Bar restoration site*

### What is a water transaction?

A water transaction is a voluntary agreement, in this case between a willing seller and the USIBWC, under which the seller agrees to sell (or lease) their EBID surface water right to USIBWC. Water transactions can be a sale, annual lease, multiple-year lease or donation.

### I would like to sell my water rights to support riparian restoration on the Rio Grande. Whom do I contact?

A water rights holder can contact Audubon New Mexico if they are interested in selling or leasing their water rights to the program. Audubon will process the offers and confirm the material facts of the water rights for sale and lease for consideration by USIBWC. Alternatively, a water rights holder can contact the USIBWC directly.

**Beth Bardwell**  
Director of Freshwater  
Conservation  
Audubon New Mexico  
4850 Tabasa Rd.  
Las Cruces, NM 88011  
575-522-5065 (office)  
575-418-0288 (cell)  
bbardwell@audubon.org

**Elizabeth Verdecchia**  
Natural Resources Specialist  
Elizabeth.Verdecchia@ibwc.gov  
915-832-4701

Our river valley was filled with large native trees including cottonwoods, Goodding willows, and native shrubs, which provided refuge from the summer heat for recreation and relaxation along the river. These native plants also provided food and cover to wildlife, songbirds, and pollinating bees and butterflies. Many of these native habitats were lost when the Canalization Project was constructed. The USIBWC has historically mowed much of the floodplain within the levees for flood control but in 2010 began setting aside additional areas which would not be mowed. The goal now is to restore a more natural environment on over 2,500 acres through a combination of practices including exotic vegetation removal, native vegetation plantings, restoration of natural river banks, supplemental irrigation, and cessation of mowing. Water is a key ingredient needed to achieve these enhanced habitat restoration goals.

### Why do we need to acquire water rights for restoration work?

Where restoration results in an increase in water depletion or irrigation is desired to sustain the new native vegetation, USIBWC will acquire water and/or water rights, at market value, from willing sellers and transfer them to the restoration sites. The EBID will

treat USIBWC like any other irrigator, with USIBWC water-righted lands receiving an equal allotment per acre like other EBID district water-righted lands, and sharing pro rata in shortages during low water years. USIBWC and its cooperating entities have contracted with Audubon New Mexico to help develop and administer the environmental water transactions program.

### What Progress has been made so far?

- The USIBWC and EBID signed a Memorandum of Understanding to work collaboratively on the EWTP.
- The EBID Board recently approved a policy authorizing the use of Rio Grande Project surface water rights for native habitat restoration.
- The EWTP has identified initial willing water rights sellers, purchased surface water rights associated with 4.0 acres of land and is in the process of acquiring more.
- The USIBWC and its partners created an irrigation plan for the Leasburg Extension Lateral Wasteway #8 restoration site with plans to irrigate in June 2014.
- The EWTP has leased water for a second irrigation of the Leasburg restoration site in 2014.
- The USIBWC constructed 55 groundwater monitoring wells at 21 restoration sites to monitor water levels and impacts from drought. This data will be vital to determining what sites need supplemental water.



*Old growth cottonwoods at the Jaralosa Restoration Site, May 2014*



*USFWS plants native trees at the Leasburg restoration site, March 2014*



*USIBWC staff monitor groundwater levels at the Leasburg Extension Lateral WW#8 restoration site, May 2014*

With supplemental water, about 1,500 newly planted trees at the Leasburg restoration site, and about 3,500 trees planted at other restoration sites, can grow and provide habitat to wildlife and endangered species while enhancing the human experience and health of the river.



For more information, visit  
[http://www.ibwc.gov/EMD/canalization\\_eis.html](http://www.ibwc.gov/EMD/canalization_eis.html) or call 915-832-4701

# USIBWC Rio Grande Canalization Project

## River Management Plan



International Boundary and Water Commission, U.S. Section

*Last Updated November 12, 2014*







## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
New Mexico Ecological Services Field Office  
2105 Osuna Road NE  
Albuquerque, New Mexico 87113  
Phone: (505) 346-2525 Fax: (505) 346-2542

August 30, 2012

Consultation No. 02ENNM00-2012-F-0016  
Previous Consultation No. 2-22-00-I-025

Gilbert G. Anaya, Chief  
Environmental Management Division (Bldg C, Suite 310)  
International Boundary and Water Commission  
4171 N. Mesa Street  
El Paso, Texas 79902

Dear Mr. Anaya:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological and conference opinion (Opinion) on the effects of the United States Section of the International Boundary and Water Commission (IBWC) proposed action of an Integrated Land Management Alternative for Long-Term Management (Land Management Alternative) of the Rio Grande Canalization Project (RGCP) in Sierra County and Doña Ana County, New Mexico, and El Paso County, Texas. This Opinion concerns the effects of the proposed Land Management Alternative on the endangered southwestern willow flycatcher (*Empidonax traillii extimus*) (flycatcher) and on the flycatcher's proposed critical habitat. Your request for formal consultation, in accordance with Section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.), was received on November 2, 2011. No permit or license applicants (16 U.S.C. 1532 and 1536(3)) were identified by IBWC as part of this consultation.

This Opinion is based on information submitted in the November 2, 2011, Land Management Alternative Biological Assessment (BA; SWCA Environmental Consultants 2011), Record Of Decision (IBWC 2009), Conceptual Restoration Plan (U.S. Army Corps of Engineers (USACE) et al. 2009), conference calls or meetings between IBWC and the Service, supplemental information provided by e-mail, and other sources of information available to the Service. The administrative record for Consultation No. 02ENNM00-2012-F-0016 is on file at the Service's New Mexico Ecological Services Field Office in Albuquerque, New Mexico.

The Service concurs with IBWC's findings that the proposed action "may affect, but is not likely to adversely affect" Aplomado falcon (*Falco femoralis*) or least tern (*Sternula antillarum*). As documented in your BA, and with additional IBWC commitment to allow these species to leave on their own volition when encountered prior to or during project activities, the Service finds that the proposed action will have insignificant and discountable effects to least tern and Aplomado falcon. Those conservation measures identified by IBWC described in the Service's 2004 concurrence letter for the proposed action (USFWS 2004) that address livestock management, mowing practices, and soil erosion remain in effect. If monitoring or other information results in modification or the inability to complete all aspects of the proposed action, consultation should be reinitiated. Please contact the Service if: 1) future surveys detect listed, proposed, or candidate species in habitats where they have not been previously observed; 2) the proposed action changes or new information reveals effects of the proposed action to listed species that have not been considered in this analysis; or 3) a new species is listed or critical habitat designated that may be affected by the action. Consultation for individual projects or river management plans may also be necessary during project planning if circumstances are different from those described in the BA. The remainder of this Opinion addresses direct, indirect, and cumulative effects of the proposed action on the flycatcher and its proposed critical habitat.

No critical habitat is currently designated for the flycatcher within the action area; however, critical habitat has been proposed for designation and this Opinion assesses effects of the proposed action on proposed critical habitat. The Service does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statute and the August 6, 2004, Ninth Circuit Court of Appeals decision in *Gifford Pinchot Task Force v. USDI Fish and Wildlife Service* (CIV No. 03-35279) to complete the following analysis with respect to critical habitat. This consultation analyzes the effects of the action and its relationship to the function and conservation role of the physical and biological features of flycatcher critical habitat to determine whether the current proposed action destroys or adversely modifies flycatcher critical habitat.

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Attorney General  
DAVID C. BLAKE  
Chief Deputy Attorney General  
MELANIE J. SNYDER  
Chief of Staff  
FREDERICK R. YARGER  
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June 8, 2016

Nancy Coulam, UC720  
Bureau of Reclamation  
125 State Street, Room 8100  
Salt Lake City, Utah 84138-1147  
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RE: Rio Grande Project Operating Agreement DEIS

Dear: Ms. Coulam:

The Colorado Division of Water Resources ("DWR") thanks you for the opportunity to comment on the Draft Environmental Impact Statement for the Rio Grande Project Operating Agreement ("DEIS"). The Office of the Attorney General for the State of Colorado submits these comments on behalf of DWR.

As home to many water users on the Rio Grande and its tributaries, and as a signatory state to the Rio Grande Compact ("Compact"), Colorado has a strong interest in how the Bureau of Reclamation operates Elephant Butte Reservoir. The Compact contains provisions concerning Elephant Butte Reservoir that protect Colorado, and the operation of the Rio Grande Project implicates some of Colorado's rights and obligations under the Compact. As such, DWR appreciates the opportunity to provide comments as set forth below.

To assist the Bureau of Reclamation as it revises the DEIS, DWR has identified areas of broad concern.

1

Rio Grande Compact: The DEIS does not always accurately construe the Compact and its provisions. In particular, calculation of Compact Credits and available Project Supply in the DEIS should comport with the Compact. Although these calculations underlie analysis of all alternatives, it is not clear that the DEIS accurately captures the impacts of the alternatives under existing legal constraints. In several locations, the DEIS appears to rely on

2 Compact Credit calculations and delivery requirements that are inconsistent with the Compact. DWR recommends working with the Rio Grande Compact Commission to more accurately describe and operate under the terms of the Compact.

3 Texas v. New Mexico and Colorado, No. 141, Original: The litigation should not be a basis for evaluating any of the alternatives in this EIS at this time. The Compact does provide a legal framework under which the Project must operate, and is common to all alternatives. However, the outcome of disputed issues in litigation is not known at this time and it is beyond the scope of the EIS to try to define the positions of the parties. These descriptions may inadvertently impact the litigation process or may undermine the results of the EIS. It is especially important for the EIS to avoid comment on the litigation because the United States is a party.

4 Project Supply and Allocation: Analysis of all alternatives presumes supplemental ground water irrigation throughout the Project area. It appears that this may affect diversion ratio, carry over amounts, and annual demands. However, the DEIS does not explain why supplemental irrigation is needed or why there are differences in the need within the Project area.

5 Moreover, the analysis does not include the entire Project area. The DEIS

6 further does not describe how historical allocation ratios are maintained given unexplained variances in Project demand and supplemental irrigation.

7 Modeling: DWR has not had sufficient time to thoroughly examine the development and application of the model that underlies the analysis of the alternatives in the DEIS. DWR does have some concerns with the lack of explanation in the DEIS for some of the assumptions used in developing the model. Moreover, because the model does not include inputs or project impacts throughout the Project area, the model may lack robustness in showing the impacts of or differences among the various alternatives.

In addition to these broad topical comments, DWR includes comments in tabular format along with this letter. These comments fall under, and are in addition to, the broad areas of concern described above. The comments are aimed at improving the DEIS, but may not include all concerns that DWR may have regarding statements made in the DEIS. As such, DWR's omission of any comment or correction of perceived misstatements does not constitute an admission or waiver with respect to any factual or legal issue in any current or future proceedings.

DWR appreciates the opportunity to review the DEIS and provide comments. Please feel free to contact me or Mike Sullivan, 303-866-3581 x8202, with any questions.

Sincerely,

FOR THE ATTORNEY GENERAL

A handwritten signature in cursive script that reads "Chad M. Wallace". The signature is written in black ink and extends to the right with a long, thin horizontal line.

CHAD M. WALLACE

Senior Assistant Attorney General

Natural Resources & Environment Section

Telephone: (720) 508-6281

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cc: Mike Sullivan

State of Colorado Comments on the Rio Grande Project Operating Agreement DEIS

Comment #	Page #	Line #	Commenting	Comment
Rio Grande Compact			Colorado Division of Water Resources	
1	ES4	88-90	" <span style="border: 1px solid red; padding: 2px;">8</span>	This incorrectly construes the nature of the litigation in No. 141. The text is unnecessary as a basis for the EIS and should be removed.
2	ES5	137-138	" <span style="border: 1px solid red; padding: 2px;">9</span>	Change "Rio Grande Project Compact" to "Rio Grande Compact."
3	1-1	10	" <span style="border: 1px solid red; padding: 2px;">10</span>	The EIS states that the alternatives are consistent with the Rio Grande Compact. However some aspects of the alternatives are being litigated regarding their alleged violation of the Rio Grande Compact. If the EIS must make a statement on this issue it should state that the Project will be operated consistent with the Rio Grande Compact. See also Comment 4.
4	1-4	93-94	" <span style="border: 1px solid red; padding: 2px;">11</span>	These items all reference subtracting non-Rio Grande Project storage, which includes Rio Grande Compact credits. However, it appears that the Compact credit adjustments only consider water physically in the reservoir at the time and calculates the credits on a monthly basis. Such a method may not accurately calculate available Project storage. Colorado accrues Rio Grande Compact credits in the amounts by which actual deliveries to the Lobatos gage in any calendar year exceed scheduled deliveries. Compact Arts. I and III. Colorado's deliveries neither need to be measured in Elephant Butte Reservoir nor estimated on a monthly basis.
5	1-5	113-114	" <span style="border: 1px solid red; padding: 2px;">12</span>	It is unclear what is meant by "other inflows to the Rio Grande" and who claims ownership to such water. Without further explanation, it cannot be determined how the alternatives allocate the inflow or how the inflow impacts the diversion ratio alternatives.

State of Colorado Comments on the Rio Grande Project Operating Agreement DEIS

6	1-7	202-203	"	13	The basis for asserting the parties to the 2008 Operating Agreement have interests in surface and hydrologically connected ground water is unclear. Is Reclamation asserting an ownership interest in groundwater? Is groundwater viewed as Project water? Is groundwater allocated independently under the laws of New Mexico and Texas? Answering these questions may be necessary to assess the impacts from the various alternatives. However, these issues may also implicate positions asserted in the ongoing interstate litigation.
7	1-8	262-264	"	14	The statement that "supplemental groundwater pumping is authorized and managed by the states, independently of the Federal Rio Grande Project" creates confusion regarding the interests stated in comment 6.
8	1-10	335-346	"	15	Construing the New Mexico District Court and U.S. Supreme Court cases is unnecessary and should be deleted.
9	1-12	434-437	"	16	Stated goals should not include conservation of hydrologically connected ground water in New Mexico and Texas. See comment 6.
10	2-8	286-288	"	17	What is the basis for increasing the amount of full Project allocation from 763,842 acre feet per year to 790,000 acre feet? This adjustment does not appear to reflect actual and historical use patterns.
11	2-10	359-364	"	18	Although Reclamation has asserted that how it calculates Rio Grande Compact credits is not a true alternative, but a modeling assumption, Colorado maintains that the basis for analysis of the alternatives incorrectly calculates Compact credits. This error affects how Reclamation determines available Project water. Colorado generates Rio Grande Compact credits in the amounts by which actual deliveries to the Lobatos gage in any calendar year exceed scheduled deliveries. Compact Arts. I and III. Colorado's deliveries neither need to be measured in

State of Colorado Comments on the Rio Grande Project Operating Agreement DEIS

				Elephant Butte Reservoir nor estimated on a monthly basis. See Comment 4.
12	3-5	60-62	"  <div style="border: 1px solid red; padding: 2px; display: inline-block;">19</div>	An evaluation in this EIS of whether the OA is in compliance with the Rio Grande Compact is not conclusive and does not reflect agreement or consensus among the Compacting parties. See Comments 3 and 4.
13	3-5 to 3-7	81-90	"  <div style="border: 1px solid red; padding: 2px; display: inline-block;">20</div>	This section incorrectly summarizes the Rio Grande Compact. The Compact does not ensure an equitable apportionment of water, but makes allocations of water that have been deemed equitable by the compacting states. The Compact does not set delivery requirements to states, but sets two delivery points, one at the Lobatos gage and one at the San Marcial gage. The Compact does not provide for delivery of water to the Rio Grande Project, at Elephant Butte Reservoir or elsewhere. The Compact does not have obligations for Colorado and New Mexico to deliver water to downstream states, but sets two delivery points, one at Labatos gage and one at the San Marcial gage.
14	4-6	231	"  <div style="border: 1px solid red; padding: 2px; display: inline-block;">21</div>	It is unclear what is meant by "In addition, the storage and relinquishment of Rio Grande Compact credit water in EBR is represented as a time-varying input." See comment 4 regarding the calculation of Compact credit water.
15	4-7	233-236	"	See Comment 4.
16	4-14	434-436	"	See Comment 4.
17	4-16	514-517	"	See Comment 4.
18	4-31	820-822	"	See Comment 4.
19	4-98	3017-3029	"	See Comments 3 and 4.
Project Supply				
20	ES4, 1-5, 1-8, 2-8, 4-13, 4-35, 4-36	112-116, 115-120, 262-264, 270-271, 267-270, 389-392,	<div style="border: 1px solid red; padding: 2px; display: inline-block;">22</div>	Common to all alternatives, it is unclear why supplemental groundwater is required throughout the Project area when a full allocation is available. Has

State of Colorado Comments on the Rio Grande Project Operating Agreement DEIS

		897-899, 906-907, 921		23	Reclamation increased the area served by the Project, the duty of water per acre, or expanded the scope of the Project? Is Reclamation allowing the Project to meet increased demands by also replacing impacts to Project deliveries caused by ground water pumping?
21	ES4, 1-5, 1-8, 3-11, 4-8, 4-35,	112-116, 115-120, 270-271, 245-249, 309, 908,	"	24	The basis for considering the impacts to irrigation efficiency from well pumping only within EBID is unclear. Related to comment 20, it appears that Reclamation has presumed an increase in the duty of water throughout the Project area, but only considered its effects in some areas.
22	3-8	141	"	25	"maintaining irrigation demand" should be changed to "meeting irrigation demand"
23	4-20, 4-35	597, 906-907	"	26	On what basis did Reclamation presume carryover for each district if it also presumed a need for supplemental ground water supply? Although it asserts ground water use is an individual user decision, analysis of the alternatives does not show how the amount of carry-over is derived, especially when all alternatives presume that the surface supply is inadequate to meet demands.
24	1-5	144-146	"	27	On what basis does Reclamation assert that HCCRD only receives excess seepage and drainage water if it has not evaluated irrigation use throughout the Project area? An analysis of the interactions between irrigation demand, irrigation efficiency, and water supply is needed to evaluate the accuracy of this conclusion.
Project Allocations					
25	1-9	277	"	28	The DEIS states that the D1 and D2 curves represent conditions during 1951 to 1978 Project operations. However, there is no explanation of whether this time period is representative of either earlier or current conditions within the Project.
26	1-9, 1-10, 2-8,	305-314, 317-321, 267-270,	"	29	The diversion ratio appears to only represent conditions within some of the Project area. It does not attempt to

State of Colorado Comments on the Rio Grande Project Operating Agreement DEIS

				account for ground water impacts, irrigation efficiency, or duty of water per acre throughout the Project area. There is no explanation of how this spatial limitation maintains equality in allocation of acre feet per acre across the Project area.
<b>Model</b>				
27	4-5, 4-8, 4-14, 4-15, 4-35, 4-37, 4-39, 4-40, 4-42,	159-170, 309, 448-449, 460-462, 908, 985, 1042, 1087, 1132,	"  <b>30</b>	The limited model domain and assumptions used in both the model and for the Project area are not the most robust method of analysis of water responses throughout the Project. Colorado suggests expanding the model domain and conducting additional evaluation of the assumptions used in the model and for unmodeled areas.
28	4-6	204	"  <b>31</b>	On what data is the presumption that all well pumping is from shallow alluvium based?

**NEW MEXICO INTERSTATE STREAM COMMISSION****COMMISSION MEMBERS**

CALEB CHANDLER, Acting Chair, Clovis  
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June 8, 2016

U.S. Bureau of Reclamation  
Attn: Nancy Coulam  
125 South State Street, Room 8100  
Salt Lake City, U.T. 84138-1147

**Submitted Via Email to: [ncoulam@usbr.gov](mailto:ncoulam@usbr.gov)**

**RE: New Mexico Interstate Stream Commission's Comments on the Draft Environmental Impact Statement for the Continued Implementation of the 2008 Operating Agreement for the Rio Grande Project, New Mexico and Texas**

Dear Ms. Coulam:

The New Mexico Interstate Stream Commission (the "Commission") submits the following comments on the draft environmental impact statement ("DEIS") for the continued implementation of the 2008 Operating Agreement for the Rio Grande Project, New Mexico and Texas (the "2008 Operating Agreement"). The notice of availability and announcement of public hearings was published in the Federal Register, 81 Fed. Reg. 14886 on March 18, 2016. The comment period was subsequently extended to June 8, 2016. 81 Fed. Reg. 27173 (May 5, 2016).

The 2008 Operating Agreement has had, and will continue to have, major effects on water users in New Mexico. The 2008 Operating Agreement also has implications for the Rio Grande Compact between Colorado, Texas and New Mexico. Therefore, the Commission has a vital interest in the DEIS for the 2008 Operating Agreement.

We hope the Commission's review of the document, and our comments contained herein, can aid the Bureau of Reclamation ("Reclamation") as it works to incorporate additional information in and corrections to the National Environmental Policy Act ("NEPA") documents for the 2008 Operating Agreement so they are completed in the spirit of full disclosure and support informed decision making. That said, for the reasons stated below, the Commission has fundamental objections to the DEIS. Due to the DEIS's inadequate analysis, a supplemental draft environmental impact statement should be prepared for public review and comment. If Reclamation does not prepare a

1 cont.

supplemental draft environmental impact statement, it should at least provide the information and analysis requested by the Commission in this document and reopen the comment period for a reasonable time thereafter to allow for true meaningful review of the DEIS.

**I. Reclamation has Predetermined the Outcome of its NEPA Analysis**

"Compliance with NEPA does not . . . justify a predetermined action. The NEPA process is intended to identify and evaluate alternatives in an impartial manner." Reclamation NEPA Handbook (DOI 2012) § 2.3.2, at 2-3. "An agency shall commence preparation of an environmental impact statement as close as possible to the time the agency is developing or is presented with a proposal so that preparation can be completed in time for the final statement to be included in any recommendation or report on the proposal. The statement shall be prepared early enough so that it can serve practically as an important contribution to the decision making process and will not be used to rationalize or justify decisions already made." 40 C.F.R. § 1502.5 (Council on Environmental Quality [CEQ] NEPA Regulations).

Reclamation cannot actually commit to a decision prior to completing its NEPA analysis and then use that analysis to "justify a predetermined action." Reclamation NEPA Handbook § 2.3.2, at 2-3. Instead, it must "identify and evaluate alternatives in an impartial manner." *Id.* Reclamation has not identified and evaluated alternatives in an impartial manner in the DEIS, but instead uses the analysis therein to justify a decision it made long ago to adopt the 2008 Operating Agreement.

The language of the DEIS purports to suggest that Reclamation has not predetermined the outcome. For instance, despite the CEQ NEPA Regulations recommendation that the agency identify a preferred alternative in the draft, if one exists, 40 C.F.R. § 1502.14(e), Reclamation does not indicate a preferred alternative in the DEIS. In choosing to not include a preferred alternative, Reclamation attempts to indicate that it has not fully made up its mind. Reclamation also frames the decision analyzed as whether to continue the 2008 Operating Agreement, again suggesting that it is truly examining this question.

Despite this language, upon in-depth review of the DEIS it becomes clear that Reclamation is attempting to paint a false portrait of the analysis undertaken in the document. The DEIS itself acknowledges that the purpose and need for the action is "to meet contractual obligations to EBID [Elephant Butte Irrigation District] and EPCWID [El Paso County Water Improvement District No. 1]." DEIS at ES-5, 1-12. These contractual obligations are in the 2008 Compromise and Settlement Agreement ("2008 Settlement") and the 2008 Operating Agreement. DEIS at ES-5, 1-7, 1-12. The former agreement

binds the parties to the terms and conditions in the 2008 Operating Agreement, and the 2008 Operating Agreement itself was executed by the parties on March 10, 2008. DEIS, App. A. The DEIS does not hide this fact, stating that "implementation of the OA is the result of settlement of litigation between Reclamation and the districts." *Id.* at 1-9. Reclamation clearly committed to a predetermined outcome by executing the 2008 Settlement and then implementing the 2008 Operating Agreement prior to completing its NEPA analysis, and it cannot justify or remedy that fact in the Draft EIS. *See, e.g., Metcalf v. Daley*, 214 F.3d 1135, 1144-45 (9th Cir. 2000) (holding that the federal agency involved violated NEPA when it irreversibly and irretrievably committed resources by entering into a contract before considering that contract's environmental consequences); *see also* 40 CFR § 1506.1 (stating that until a record of decision is issued, no action on the proposal shall be taken that would have an adverse environmental effect or limit the choice of reasonable alternatives).

This is further reflected in the alternatives that Reclamation examines in the DEIS. Alternatives 1 and 2 simply continue the 2008 Operating Agreement in accordance with the current manual while Alternatives 3 and 4 simply remove one major new feature of the 2008 Operating Agreement each. With the exception of Alternative 5, all alternatives involve continued implementation of the 2008 Operating Agreement in some form. DEIS at ES-7. This is because the 2008 Settlement and 2008 Operating Agreement bind Reclamation to implementation of the carryover storage and diversion ratio provisions through 2050. DEIS, App. A § 1.8, at 2 (carryover storage); § 2.5, at 5 (diversion ratio). The DEIS acknowledges that implementing Alternative 5 "would . . . breach the settlement agreement among the U.S., EBID, and EPCWID." DEIS at 2-6.

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In short, because Reclamation executed a binding contract requiring implementation of the 2008 Operating Agreement prior to conducting a NEPA analysis it irretrievably and irreversibly committed itself to that decision. Reclamation's own handbook specifically counsels against this type of action, stating, "NEPA also requires that environmental concerns and impacts be considered during *planning* and *decision making* so steps may be more easily taken to correct or mitigate the impacts of an action." Reclamation NEPA Handbook § 2.3.1, at 2-2 (emphasis added). This is true for water contract negotiations just as with any other Reclamation Project. "At the very beginning of the contracting process . . . Reclamation should engage the NEPA process and include the consideration of environmental factors into development of a B[asis] O[f] N[egotiation]." *Id.* at § 4.12.2, at 4-9. Reclamation failed in this task by rushing into the 2008 Settlement and 2008 Operating Agreement. Reclamation tries to remedy its lack of planning by now claiming in the DEIS that the "decision to be made" is "whether to continue to implement the OA through 2050," yet it is clear that decision has already been made. This is a fundamental flaw in the DEIS and in Reclamation's NEPA process.

## **II. The DEIS Fails to Adequately Examine the Full Range of Alternatives**

The alternatives analysis "is the heart of the environmental impact statement." 40 C.F.R. § 1502.14. An agency must select and discuss a range of alternatives that "fosters informed decision making and informed public participation." *California v. Block*, 690 F.2d 753, 767 (9th Cir. 1982). It is contrary to the purpose of NEPA to fail to examine a range of alternatives, focusing rather on extremes or "straw man" alternatives that lead to a pre-ordained selection. *See Natural Resources Defense Council, Inc. v. Evans*, 232 F.Supp.2d 1003, 1038-41 (N.D. Cal. 2002). For the reasons discussed below, Reclamation has not demonstrated that it has analyzed a full range of alternatives, thereby failing to allow for informed decision making and public participation in regard to the 2008 Operating Agreement. The Commission requests that the DEIS be revised to include detailed consideration of additional alternatives as Reclamation continues its analysis.

### **A. The Purpose and Need Statement in the DEIS is defined so narrowly as to preclude the consideration of a reasonable range of alternatives.**

3

An environmental impact statement must contain a statement that specifies the underlying purpose and need to which the agency is responding. 40 C.F.R. § 1502.13; Reclamation NEPA Handbook § 8.5, at 8-5. The purpose and need statement "is a critical element that sets the overall direction of the process and serves as an important screening criterion for determining which alternatives are reasonable." Reclamation NEPA Handbook § 8.5, at 8-5. Courts have long recognized that an agency may not define the purpose of and need for an action in unreasonably narrow terms because that will unduly constrain the range of alternatives considered in an environmental impact statement. *See, e.g., Simmons v. U.S. Army Corps of Engineers*, 120 F.3d 664 (7th Cir. 1997) (stating that "[o]ne obvious way for an agency to slip past the strictures of NEPA is to contrive a purpose so slender as to define competing 'reasonable alternatives' out of consideration...."). "If a purpose and need statement appears to allow only one reasonable solution, the statement, as well as the reasons for rejecting other alternatives, should be re-examined and confirmed or revised, as appropriate." Reclamation NEPA Handbook § 8.5, at 8-6.

The purpose and need statement in the DEIS is "to meet contractual obligations to EBID and EPCWID and comply with applicable law governing water allocation, delivery, and accounting." DEIS at ES-5, 1-12. The contractual obligations are the 2008 Settlement and the 2008 Operating Agreement, as the DEIS acknowledges. DEIS at ES-5, 1-7, 1-12. The DEIS specifically states that "implementation of the OA is the result of settlement of litigation between Reclamation and the districts." DEIS at 1-9.

3 cont.

Defining the purpose and need as meeting prior contractual obligations to EBID and EPCWID artificially and unreasonably constrains the analysis in the DEIS by constraining the options available for examination to those that allow for "continued implementation through 2050 of the operating procedures defined in the OA and RGP [Rio Grande Project] operations manual." DEIS at ES-7. And, the only alternatives that satisfy the purpose and need of "meet[ing] contractual obligations to EBID and EPCWID" are Alternatives 1 and 2. Both of these alternatives involve continued implementation of the 2008 Operating Agreement in accordance with its terms. DEIS at ES-7, 2-3. The only difference between them is that Alternative 2 does not involve the storage of San Juan-Chama Project water in Elephant Butte Reservoir. DEIS at ES-7, 2-3. This is not a meaningful difference and demonstrates that Reclamation, contrary to its own NEPA Handbook, has artificially constrained the purpose and need statement as to allow for "only one reasonable solution"— continued implementation of the 2008 Operating Agreement. Reclamation must revise the purpose and need statement in the DEIS to allow for analysis of a meaningful range of alternatives, such as those addressed below in Section II.C.

#### **B. Reclamation Improperly Defined the No-Action Alternative.**

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The CEQ's NEPA regulations require agencies to consider "the alternative of no action" in every environmental impact statement. 40 C.F.R. § 1502.14(d). When Reclamation is considering adopting a new contract, the no action alternative "represents conditions as they would be with no contract." Reclamation NEPA Handbook § 4.12.2, at 4-9. Only when Reclamation is considering renewing a contract should the no-action alternative mean "continuing the existing contract." *Id.* § 4.12.2, at 4-9. Reclamation's 2007 Environmental Assessment,<sup>1</sup> although it was prepared to analyze adhoc changes to Project operations rather than the 2008 Operating Agreement, properly stated that, under the no-action alternative, "the Rio Grande Project would continue to operate under Reclamation's previously imposed operation procedures as it has for more than 20 years." 2007 Environmental Assessment at 6. The 2013 Supplemental Environmental Assessment,<sup>2</sup> which did address the 2008 Operating Agreement, also properly stated the no-action alternative "would continue Project operations according to pre-OA conditions." Reclamation's analysis in 2013 examined pre-Operating Agreement ("pre-OA") conditions even though it was prepared five years after adoption of the 2008 Operating Agreement, because it was intended to analyze the environmental effects of

<sup>1</sup> In 2007 Reclamation issued an Environmental Assessment and Finding of No Significant Impact for a set of operating procedures that constituted a material departure from historic operations. Its focus was a five-year period, but the procedures were superseded by the 2008 Operating Agreement without additional NEPA review.

<sup>2</sup> In 2013 a Supplemental Environmental Assessment and Finding of No Significant Impact was issued for continued implementation of the 2008 Operating Agreement for the three-year period 2013-2015.

4 cont.

a new contract—the 2008 Operating Agreement. 2013 Supplemental Environmental Assessment at 10.

However, in the DEIS Reclamation has dramatically shifted its position and improperly characterized its no-action alternative as “continued implementation through 2050 of the operating procedures defined in the OA and RGP Operations Manual.” DEIS at ES-7. Because Reclamation is still analyzing the effects of entering into the 2008 Operating Agreement, not renewing it, it is improper and logically inconsistent for Reclamation to assume the existence of this very action as part of the no-action baseline. It is also misleading to the public regarding the nature of the proposed action and its environmental impacts. Reclamation should revise the DEIS to include operation of the Project according to pre-OA conditions as its no-action alternative so that it can properly compare the environmental impacts of the 2008 Operating Agreement to true baseline conditions.

### C. Reclamation Failed to Fully Consider Feasible Alternatives

Federal agencies must “[r]igorously explore and objectively evaluate all reasonable alternatives.” 40 C.F.R. § 1502.14(a). While the range of alternatives must be reasonable and feasible, Reclamation should “include alternatives based upon input from other agencies, the public at large and local community interests. If one or more community alternative(s) exist, and it is feasible and practical, it should be included in the EIS.” Reclamation NEPA Handbook § 8.6.2, at 8-9. When Reclamation limits the range of alternatives, “the criteria used to limit the alternatives should be explicitly defined by Reclamation and logically supported.” *Id.*

Section 2.5 of the DEIS describes alternatives considered but eliminated from detailed study. Analysis of this Section indicates Reclamation’s continued failure to comply with its own NEPA Handbook. Reclamation fails to examine several alternatives that are reasonable and feasible and were suggested by the Commission in the scoping process.<sup>3</sup> Moreover, Reclamation eliminates several reasonable alternatives arbitrarily and without any suggested criteria for doing so. Reclamation should reconsider its decision to eliminate the following alternatives in a supplemental draft environmental impact statement. The Commission also suggests ways to expand on the alternatives analysis, including additional alternatives.

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Prior to delving into the Commission’s analysis of the DEIS alternatives, it is important to note that on April 7, 2016 the Commission requested additional information regarding the hydrologic modeling used in the DEIS analysis. See Attachment B, (April 7, 2015

<sup>3</sup> See Attachment A, (February 14, 2014 letter from the Commission to Reclamation).

letter from the Commission to Reclamation). The Commission asked for specific data files, source code, and documentation for Model Enhancements, Model Calibration, Model Sensitivity Analyses, GIS Files, and Hydrologic Inputs to the Model.<sup>4</sup> Reclamation performed hydrologic analysis of the Rincon and Mesilla basins using the United State Geologic Survey ("USGS") groundwater flow modeling software MODFLOW-OWHM (Hanson et al., 2014), with additional software features developed and implemented by Reclamation in collaboration with the USGS. This additional software is used to simulate the surface and ground water operations for the area of the Project analyzed by Reclamation for each of the DEIS alternatives. To fully analyze simulated Project operations, we must have access to the new software code, its documentation and full information on its linkage to MODFLOW-OWHM. Absent this information, the Commission is not able to fully evaluate whether proposed alternatives correctly simulate the full scale of the operations under the 2008 Operating Agreement, and operations prior to the Agreement. Accordingly, the Commission's analysis of the modeling scenarios is limited to the model outputs received from Reclamation.

1. *Removing Credits and Charges and Using Actual Deliveries of Water in Accounting*

The system of credits and charges is a significant aspect of the Project water accounting under the 2008 Operating Agreement, and is therefore explicitly within the scope of the DEIS analysis. However, the alternative described in the DEIS is poorly framed as an all or nothing proposition; Reclamation states that examining such credits and charges did not meet the purpose and need and is outside the scope. The Commission disagrees. The credits and charges could and should be evaluated for potential revision or refinement to the 2008 Operating Agreement, an easy alternative to examine in the DEIS. Moreover, adjustments to some of these credits and charges to reflect actual deliveries would make the accounting of Project water use by EBID and EPCWID more reasonable and more equitable under the 2008 Operating Agreement.

5 cont.

To adequately address this alternative, the Commission recommends that the system of charges and credits in the 2008 Operating Agreement and the Rio Grande Project Operations Manual ("Operations Manual")<sup>5</sup> be evaluated by considering whether or not the associated operations are reflected in the data used to develop the D1 and D2

<sup>4</sup> The Commission has actually been requesting specific information on the modeling tools used to conduct the analysis in the DEIS since the scoping period, but Reclamation has continued to withhold this information. See Attachment A, at 3-4 (Commission's Comments on Scoping).

<sup>5</sup> The Operations Manual is a companion document that is intricately tied to the 2008 Operating Agreement. The Operations Manual is further discussed in Section IV.E., below.

5 cont.

curves.<sup>6</sup> For example, data behind the D2 regression analysis is not well documented, but appears to be based on annual total canal heading diversions from 1951 – 1978. This historical diversion data would not include the same credit and charge system that the Project employs today, and therefore there is a systematic difference between the “diversions” of the D2 data set and the “charged diversions” that calculate today’s diversion ratio. The effects of this systematic difference should be evaluated, especially given the fact that the 2008 Operating Agreement charges EBID for all discrepancy from the D2 curve. By simply eliminating this proposed alternative from analysis in the DEIS, Reclamation is ignoring a reasonable adjustment to the 2008 Operating Agreement and failing to “[r]igorously explore and objectively evaluate all reasonable alternatives.” 40 C.F.R. § 1502.14(a).

The inequitable effect of the current application of credits and charges under the 2008 Operating Agreement is easily demonstrable. The diversion data from which the D2 curve was derived include diversions made by EPCWID in winter months. Current accounting no longer includes off-season diversion, and the resulting discrepancy is charged to EBID. The D2 diversion data includes drain flows diverted into the EPCWID canal system. Such diversion of drain flows either no longer occurs or is no longer accounted for, and the resulting discrepancy is charged to EBID. Furthermore, the 2008 Operating Agreement awards EPCWID the American Canal Extension credit, which in theory accounts for delivery efficiency improvements in the El Paso Valley. It is unclear how this credit is applied, but as described in the 2008 Operating Agreement, this credit causes an equal reduction in EBID’s allocation.

In general, credits tend to reduce charged diversion below actual diversions, and tend to reduce the diversion ratio. Under the 2008 Operating Agreement, reductions to the diversion ratio result in reductions to EBID’s allocation. In addition, credits that EPCWID receives at the end of the year, or in excess of the district’s needs, go directly into the EPCWID’s carryover account. The carryover account, plus additional water designated to ensure delivery of the carryover water, is sequestered early in the following year’s allocation process, leaving less water available for current year allocation, thus reducing EBID’s potential allocation.

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<sup>6</sup> The D1 curve is a linear regression of annual Project release data and Project delivery data, using data on delivery to U.S. farms, and to Mexico at Acequia Madre, from 1951-1978. The purpose of the D1 curve was to estimate the delivery shortage based on the amount of Project water available for release from Caballo Dam, which was in turn used to determine the Mexican Allocation. The D2 curve is a linear regression of annual Project release data and total canal diversion data for the same period of time. The purpose of the D2 curve was to determine the amount of water to be allocated for diversion at canal headings in New Mexico, Texas and Mexico, based on the amount of Project water available for release from Caballo Dam. To the best of the Commission’s knowledge, Reclamation has accepted the curves as definitive determinations of historical system performance, but the Commission is unaware of a detailed analysis supporting the determination.

5 cont.

a. Additional Alternative

An important feature that should be simulated as part of an alternative is a modified allocation procedure that assigns deficits in Project performance equitably between EBID and EPCWID, instead of assigning them all to EBID as the current allocation procedure does. The Commission suggests the following alternative process be conducted in a supplemental draft environmental impact statement:

- (1) Determination of the factors that cause discrepancy between current Project performance, as measured by the diversion ratio, and historic Project performance, as reflected by the D2 curve;
- (2) Quantification of D2 discrepancy effects, i.e., the quantification of the effect of these factors on current Project performance relative to historical Project performance;
- (3) Equitable assignment of these D2 discrepancy effects between EBID and EPCWID based on the causes of the factors; and
- (4) Revision of the allocation procedure so that both EBID and EPCWID are allocated their D2 shares, reduced by the equitable assignment of D2 discrepancy effects.

Specific factors that need analysis under this proposed alternative include:

- (1) Accounting Artifacts: factors present in current accounting have caused systematic differences between the net allocation charges currently used in determining Project performance and the diversions used to determine historical Project performance;
- (2) Groundwater pumping and/or increased depletions: changes in groundwater pumping, depletion, and irrigation practices that have impacted all historical sources of Project Supply in the Rincon, Mesilla and Hueco basins; and
- (3) Credits: Allocation or accounting terms which increase the total amount that one District can divert but may have negative impacts on the allocation of the other District (such negative impacts are most likely to impact EBID under the diversion ratio allocation).

2. Change Carryover Accounting to Reflect Actual Conservation

6 The Carryover Accounting provision of the 2008 Operating Agreement was not adequately analyzed in the DEIS, or Reclamation's earlier NEPA efforts, to determine its full impact on Project operations. As summarized in Section 4.4.7 of the DEIS, the

carryover provision of the 2008 Operating Agreement is projected to result in the following average annual impacts on EBID (P50 Scenario):

6 cont.

	Alternative 3 (No Carryover Accounting)	Alternative 1 (2008 OA)	Impact of Carryover Accounting	% Impact of Carryover Accounting
EBID Supply				
Total Allocation	264,752	213,053	-51,699	-19.5%
Net Diversions	198,287	153,583	-44,704	-22.6%
Farm Deliveries	94,477	72,841	-21,636	-22.5%

The simulated impact of carryover accounting on the estimated Project water allocation, diversions, and deliveries to EBID shown in the above table is substantial. The Commission requests, as it did during the scoping process for the DEIS,<sup>7</sup> a full evaluation of the carryover accounting practices under the 2008 Operating Agreement. The DEIS only analyzed complete removal of the carryover provision. DEIS, Section 2.3, at 2-3. While changes in the Project authorization may be needed, adjusting the carryover accounting provisions in the 2008 Operating Agreement is a reasonable alternative that should have been considered in the DEIS to address the current inequities of the 2008 Operating Agreement for EBID and its farmers, as well as to provide EPCWID a savings account for use in very dry years. The following outlines the evaluation the Commission believes is warranted in a supplemental draft environmental impact statement.

Under the 2008 Operating Agreement, unused allocation is accounted for as carryover in Project storage whether or not this water is physically available in the Project reservoirs at the end of the year (i.e., "paper carryover"). In the following year, these paper carryover accounts are filled first with the available physical supply in the reservoir and inflow to the reservoir. To the extent that paper carryover needs to be filled with wet water during a calendar year, this reduces the annual allocation of Project water in the current year to both districts and to Mexico.

The adverse impacts of the carryover accounting on Project water allocations to Project supply are magnified by the diversion ratio adjustment portion of the 2008 Operating Agreement. The actual diversion ratio varies from year to year depending on hydrologic conditions, pumping, irrigation efficiencies, irrigation return flows, and other factors. The

<sup>7</sup> Attachment A, at 6.

magnified impact occurs when a district calls for delivery of water in a year with a lower diversion ratio than the year in which the water was saved. For example, if EPCWID calls for delivery of 100,000 acre-feet ("AF") of water in a year with a diversion ratio of 1.0, then 100,000 AF must be released from storage to make that delivery. If EPCWID instead carries that water over in storage because its demand was presumably fulfilled with less water in a "wet" year and calls for its delivery in a subsequent year under dry hydrologic conditions with a diversion ratio of 0.7, then 142,800 AF would have to be released in order to deliver 100,000 AF to EPCWID. This increased release would reduce the annual allocation to EBID in the current year and/or subsequent years and inappropriately shifts the equitable management of Project water during periods of dry or drought conditions, when the value of water for crop irrigation is acute.

7 A related factor is the absence of any charge or reduction for evaporation on carryover allocations under the Operating Agreement. Because no evaporation is charged to the carryover, water that would otherwise be available for annual allocation to the Districts and Mexico is instead required to satisfy evaporative losses that are not reflected in the unreduced carryover amount. This practice is contradictory to standard reservoir accounting practices, including those employed by Reclamation in other Projects, in which each account or "pool" of water held in storage is assigned its proportional share of evaporation.

In practice, EPCWID has been the main beneficiary of carryover because in full-supply years EPCWID is allocated more water than it needs. In several years EPCWID's carryover account exceeded 200,000 acre-feet, while EBID has never carried over more than 40,000 acre-feet. Thus the benefits associated with the diversion ratio adjustment to carryover, and evaporation-free carryover, predominantly accrue to EPCWID to the detriment of EBID.

The impact of these aspects of the carryover accounting on the Project water allocation and Project water diversions to EBID should have been analyzed as part of the DEIS. Adjusting the following in the accounting procedures is a feasible alternative to continuing to implement the 2008 Operating Agreement as is: (1) water available for annual allocation; (2) evaporation; (3) paper accounting credits; and, (4) the diversion ratio. Failing to consider modifications to the accounting violates Reclamation's obligation to examine all reasonable and feasible alternatives. A supplemental draft environmental impact statement should be prepared including analysis of alternative formulations of the carryover storage provision of the 2008 Operating Agreement that reduce or eliminate the current negative effects of the carryover storage on EBID.

8

### 3. *Changes in Drought Factor and Evaporation Calculations*

For reasons further described in Section IV.E. below, failing to examine changes to the Operations Manual is a fundamental flaw in the DEIS. In regard to the alternatives analysis, ~~dismissing review of changes in the drought factor and evaporation calculations~~ again demonstrates Reclamation's failure to analyze all reasonable alternatives.

The Operations Manual does more than merely implement the 2008 Operating Agreement. Again, as discussed in depth below, modifications to the Operations Manual have resulted in material changes in the operation of the Project. For example, a "drought factor" was added to the Operations Manual in May 2012 to reduce the D2 allocation in multiple drought years. This type of large scale change to Project operations should be analyzed in this NEPA process. The Operations Manual is intricately tied to the 2008 Operating Agreement. Accordingly, material changes to the Operations Manual should be evaluated under NEPA whether or not there is a corresponding formal change to the OA. Without conducting this analysis Reclamation has failed to examine the full range of alternatives.

### 4. *San Juan - Chama Storage Contract Options*

9

The Commission does not agree that adequate analysis was conducted under Alternative 2 in regard to the San Juan - Chama Storage Contract Options or for San Juan Chama water, in general. The storage of San Juan - Chama Project water was analyzed by adding the lesser of 50,000 AF to Project Storage or the unused space available in storage to the Rincon Mesilla Basin Hydrologic Model results. There was no simulated delivery to or use of the San Juan - Chama water from storage in Elephant Butte Reservoir ("EBR"), nor was evaporation charged to the San Juan - Chama water from storage as required by San Juan - Chama accounting. Because the analysis procedure was so simplified, the results do not reasonably represent the effect of storage of San Juan - Chama water on the operation of the Project, especially during times of drought. Because EBR does not have an authorized minimum pool, water levels were historically and can currently be drawn down to very low levels. In the past, such operations had negative impacts on the reservoir fishery and recreation, at the minimum. San Juan -Chama water storage was authorized by Congress in EBR, in part, to reduce those impacts. They are not evaluated or discussed in the DEIS but should be.

The Commission recommends Reclamation simulate San Juan - Chama storage and use at EBR along with effects of the 2008 Operating Agreement on storage levels at EBR, particularly during drought, to fully assess the impacts on the local environment and economy.

### III. The Scope of Review in the DEIS is Inadequate

An agency's choice of the geographic area of its analysis must "represent a reasoned decision and cannot be arbitrary." *Idaho Sporting Congress v. Rittenhouse*, 305 F.3d 957, 973 (9th Cir. 2002). Courts will strike down an environmental impact statement if a geographical limitation on the agency's analysis is not supported by the record. *Utahns for Better Transp. v. Dep't of Transp.*, 305 F.3d 1152, 1179-80 (10th Cir. 2002). For example, an environmental impact statement will be held invalid if the record reflects that an action is likely to have impacts beyond the geographical limitations selected by an agency and the agency fails to provide a reasoned analysis for the boundaries it selects. *Id.* Here, Reclamation inappropriately limited the geographic scope of impacts to the Project area in New Mexico downstream of EBR.<sup>8</sup>

#### A. **Failure to Include Areas South of American Dam**

First, the DEIS fails to analyze the full Project area. While the Project extends nearly 160 miles from EBR south along the Rio Grande valley to the El Paso and Hudspeth County line in Texas, the DEIS analysis extends south only about 110 miles, ending at the International Boundary and Water Commission American Dam. The geographic scope of the technical analysis in the DEIS should be extended to include the area between American Dam and Fort Quitman. The following are among the reasons that the study area should be expanded downstream to Fort Quitman.

- (1) The area is a major part of the Rio Grande Project - Over the 100-plus year history of Rio Grande Project (the "Project") operations, Reclamation made water deliveries as far south as Fabens Texas, over 40 miles south of American Dam....The impacts of activities upstream of Fabens, if not Hudspeth, that affected farm headgate deliveries as well as determination of reasonable operational waste within EPCWID to Hudspeth are necessary to assess the differences in Project Water supply available to the Districts between alternatives.
- (2) Pumping Capacity in EPCWID - Contrary to statements in the DEIS, significant irrigation pumping capacity exists in the EPCWID service area. See Figure 1, attached. Therefore, differences in Project supply to EPCWID between the alternatives would result in changes in pumping costs in EPCWID rather than an economic loss of the full value of the water. It is necessary to model the irrigation and municipal water supply operations in the El Paso Valley to assess the

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<sup>8</sup> Again, New Mexico has raised these geographic scope issues before to Reclamation. Attachment A at 6.

10 cont.

hydrologic and socioeconomic impacts of differences in Project water supply to EPCWID between the alternatives.<sup>9</sup>

- (3) Effect of Water Operations Downstream of American Dam – Irrigation and municipal water supply operations in the El Paso Valley affect the deliveries of Project water to the farmers in those areas. For example, pumping in the El Paso Valley area can increase conveyance losses in the river, conveyance losses within the canal systems, and on-farm losses. These increases in conveyance and on-farm losses increase the amount of Project water that is required to be released to meet the delivery demands. This in turn affects the Project water allocations to the Districts. It is necessary to model the water supply operations in the El Paso Valley to assess the impacts of those operations on the Project water deliveries.

11

In addition, operations below American Dam generate allocation terms and accounting credits that impact the allocation distribution of water throughout the Project. For example, the American Canal Extension Credit results from operations below American Dam, and this is an explicit term in Project allocation that increases the allocation to EPCWID and reduces the allocation to EBID. Other accounting credits based on operations below American Dam such as the Haskell Street Waste Water Treatment Plant Credit and El Paso Valley Credit, reduce the total Project allocation charges, reducing the diversion ratio and modifying the allocation between EBID and EPCWID. Some of EPCWID's credits are applied at the end of the accounting process, and end up in the EPCWID's carryover allocation for the next year. This transfers a credit given below American Dam into "carryover obligation" storage in EBR, directly impacting allocation and distribution of water throughout the Project.

12

The DEIS states that "[g]roundwater pumping in the El Paso Valley portion of EPCWID does not affect RGP deliveries (Reclamation 2015a). This is because the effects of pumping occur downstream of RGP diversion points." Reclamation goes on to state "[t]he effects of pumping" did not "occur downstream of the RGP diversion points" during the historical period which forms the basis of the 2008 Operating Agreement (1951-1978). The Commission strongly disagrees. The Project had sources of supply downstream of even Riverside Diversion Dam during that historical period which are now either extinct due to groundwater pumping in the El Paso Valley, or are no longer counted as Project supply. And, major features that today reduce the effects of pumping on the river near El Paso were not constructed until a decade or two after the time period referenced by Reclamation. In either case, this change from historical conditions causes additional discrepancies in water supply which are all deducted from EBID's allocation in the 2008 Operating Agreement. Pumping in Texas by EPCWID

<sup>9</sup> See also Attachment C, references for Texas groundwater pumping data.

farmers, by the EPCWID itself, by municipalities, and others have reduced the delivery efficiency of the Texas part of the Project, and thus reduced Project supply.<sup>10</sup> Under the 2008 Operating Agreement, it is EBID alone that must bear the cost of all impacts to Project supply. This outcome must be analyzed in a supplemental draft environmental impact statement by extending the geographic scope of review.

13

Another biased statement seeming to justify Reclamation's flawed geographic scope is the following statement, found on page 1-10 and 2-8 of the DEIS:

"While numerous factors affect RGP performance, recent changes in performance are predominantly driven by the actions of individual landowners within the EBID service area. These changes are as follows:

- Crop selection and related effects on crop irrigation requirement
- Irrigation practices and related effects on farm irrigation efficiency
- Widespread use of groundwater for supplemental irrigation, as permitted and regulated by the State of New Mexico."

Again, Reclamation cannot use such biased statements to justify its erroneous scope of review in the DEIS. These changes are found in EPCWID as well, and would also have an effect on Project performance. The DEIS does not include any analysis or quantification of the effect that these various factors have had on Project performance (or apparent performance). Therefore the conclusion that these changes are "predominantly driven" by actions within EBID is not supported.

14

It is not reasonable to reduce allocation to one district because of increases in efficiency that have taken place throughout the entire Project. The Project was designed and implemented as a pro-rata system; if one farmer becomes more efficient, and therefore the historical performance of the Project changes, this is a natural outcome of improved agricultural practices in the region. The language of the DEIS suggests that any impacts of improved agricultural processes should only be borne by EBID, even though the same practices have been implemented by farmers in both New Mexico and Texas. This constitutes a change to the pro-rata system employed by most (if not all) Reclamation projects, and it is so unusual that it clearly constitutes a significant difference within the Project. Limiting the geographical area to exclude the Texas portion of the Project forecloses a necessary assessment of this action. Reclamation's decision to limit the scope in this fashion is unreasonable and arbitrary.

<sup>10</sup> In addition to this pumping that occurs in the Texas portion of the Project, the City of El Paso also has large well fields in the Mesilla Bolson and Hueco Bolson. The City supplies about 25,000 AF per year of water to its service area from these wells, which again, is not noted in the DEIS. See [http://www.epwu.org/water/water\\_resources.html](http://www.epwu.org/water/water_resources.html).

**B. Failure to Analyze Impacts Upstream of Elephant Butte.**

15

The upstream study limit in the DEIS precludes consideration of significant impacts associated with the proposed action and its alternatives. An environmental impact statement must evaluate the direct and indirect effects of the proposed action and its alternatives. See 40 CFR 1502.16; 1508.8 & 1508.25(c); Reclamation NEPA Handbook § 3.10, at 3-14; § 8.8.3, at 8-14 & 8-17. In order to do so, under a properly scoped EIS, "[t]he entire area of potential effect is included in the discussion of affected environment, including potentially affected areas outside the immediate project area." Reclamation NEPA Handbook § 8.7, at 8-13. See *also* 50 CFR 402.02 (defining the action area, for purposes of ESA Section 7 consultation, as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action"). Accord ESA Section 7 Consultation Handbook (USFWS/NMFS 1998) Glossary at x; § 4.5, at 4-17 & 4-18. Failure to adequately examine these impacts upstream of EBR is also a fundamental flaw in the Biological Opinion issued by the U.S. Fish and Wildlife Service, as addressed below in Section IV.F.

Despite the Commission's request during the scoping process that upstream impacts be evaluated, the study area for the DEIS is admittedly limited, with its upstream area of analysis stopping at the San Marcial Railroad Bridge above EBR. See DEIS § 1.10, at 1-14 (stating that "[t]he area of analysis for the OA and EBR storage is relatively limited within the broader RGP geographic area and varies by resource and resource issues...."). As described below, use of this truncated upstream study limit effectively precludes any examination in the DEIS of the potential direct and indirect and cumulative impacts that will occur upstream as a result of the proposed action and its alternatives.

The Rio Grande Compact (the "Compact") contains a number of Articles that are affected by storage in Project reservoirs, including New Mexico's delivery compliance under Article IV; the spill provision in Article VI; debit water operations from upstream reservoirs under Article VIII; and, the upstream storage restriction under Article VII. Changes in the operation of Elephant Butte and Caballo reservoirs contained in the 2008 Operating Agreement will impact Compact accounting, thereby affecting these Compact provisions. The 2008 Operating Agreement provisions relating to carryover storage, diversion allocations, allowing year round releases from Caballo Reservoir, and allowing for releases greater than 790,000 AF in a year without regard to beneficial use on Project lands have significant implications for Compact compliance and related water management operations.

Of particular concern is the impact on Article VII, which restricts the operation of almost all reservoirs in the Rio Grande Basin in New Mexico *upstream* of EBR based upon the

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amount of Usable Water in Elephant Butte and Caballo Reservoirs. See Figure 2, map of major Rio Grande Basin reservoirs. The changes listed above impact the timing and duration of Article VII storage restrictions on upstream reservoirs and, consequently, the amount of water that can be stored and released from them. The Middle Rio Grande Basin is dependent upon these upstream reservoirs to meet irrigation demand, to deliver water to municipalities, and to provide water for endangered species in the middle Rio Grande valley of New Mexico. This has specific consequences for reservoirs used to store water for large water users in the middle Rio Grande valley of New Mexico including the Middle Rio Grande Conservancy District, the Albuquerque Bernalillo County Water Utility Authority, and the City of Santa Fe, as well as numerous other water users in New Mexico and Colorado. It also affects releases of water for use by these entities, as well as water releases for the Rio Grande silvery minnow and Southwestern willow flycatcher, and for federally designated critical habitat upstream of EBR. These considerations are hereinafter referred to collectively as "Upstream Impacts."

Reclamation appears to justify its exceedingly narrow scope of analysis in the DEIS based upon its characterization of Reclamation's limited discretion and limited effects associated with EBR operations under the 2008 Operating Agreement. Reclamation has characterized this as follows:

Reclamation has limited discretion associated with normal EBR operations under the RGOA. Water stored in the RGP is the result of inflows dictated by Compact guidelines for New Mexico and Colorado. The needs of irrigators and irrigation delivery orders are non-discretionary and include treaty obligations to the Republic of Mexico. Irrigation release rates and times are determined by the two districts and Mexico, and are calculated to meet daily irrigation demands. **Reclamation cannot restrict or increase releases to affect Article VII restrictions on upstream States.** Reclamation's only discretionary actions associated with the RGOA are general operational guidelines and the two changes from historical operation ... the diversion ratio adjustments and the carry-over concept. Reclamation also has discretion over the storage of SJ-C water in EBR, and the timing of releases from EBR into Caballo Reservoir to maintain sufficient water in Caballo for irrigation demands." (Memorandum dated Aug. 20, 2015 transmitting Biological Assessment addressing effects of the OA on federally listed species) (emphasis added).

The above characterizations are incorrect in material respects, and Reclamation has acted arbitrarily in crafting a scope of analysis that ignores these Upstream Impacts.

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cont.

Reclamation's discretionary action of executing the 2008 Operating Agreement is the direct cause of changes in total storage amounts in EBR and changed reservoir releases, both of which affect Article VII restrictions on upstream storage and, potentially, other aspects of the Compact important to New Mexico and Colorado. Specifically, when Usable Water in Project storage exceeds the Article VII threshold of 400,000 acre-feet, New Mexico can store in upstream reservoirs; but when it goes below 400,000 acre-feet, upstream storage is restricted. This means that the 2008 Operating Agreement has affected Article VII restrictions on upstream storage and that Reclamation's representations above are incorrect.

16

The DEIS fails to adequately examine the effects of the 2008 Operating Agreement on evaporative charges under the Compact as well. A large volume of the water flowing into EBR each year is lost to evaporation. These evaporative losses are charged to New Mexico under the Compact because the delivery point under Article IV of the Compact is at the gage downstream of the dam. Operations under the 2008 Operating Agreement that result in more water being held in EBR for longer periods of time accordingly affect New Mexico's deliveries under the Compact. Again, this Compact implication of the 2008 Operating Agreement should have been evaluated as part of the DEIS.

17

Additionally, Reclamation's failure to simulate the effects of the 2008 Operating Agreement in Article VI, VII, and VIII conditions on upstream storage means that the model does not simulate differences in inflows to EBR and Compact credits caused by differing upstream storage conditions. The DEIS incorrectly assumes that the inflows to EBR and amount of Compact credit water in EBR are the same in each Alternative. Different specific Project operations under different Alternatives will produce different Article VI, VII and VIII conditions, different upstream storage restrictions, and different inflow to Elephant Butte.<sup>11</sup> The scope of Reclamation's analysis must include all direct and indirect upstream effects, including how those effects will impact the alternatives listed.<sup>12</sup>

<sup>11</sup> Different inflows to EBR would result in different amount of Compact credit water in storage. Compact credit in EBR is generated by a monthly Powersim model (URGSIM) that simulates EBR and Caballo releases as average of historical releases for all climate scenarios, but does not specifically simulate EBR or Caballo operations.

<sup>12</sup> Furthermore, because the DEIS does not include analysis of the Compact, the alternatives simulated by Reclamation do not include any reduction of Compact credit water by evaporation during the year (see Appendix A: RESERVOIR\_STORAGE.xlsx). This is inconsistent with Reclamation's actual operations during 2011 which reduced credit water by evaporation during the year when allocating water to the two districts. Therefore, failure to examine the Compact in the simulated alternatives does not represent Reclamation's actual allocation process. (Note that New Mexico strongly objects to the application of evaporation to Compact credit during the year by Reclamation, but if Reclamation plans to continue to do so, this must be simulated in the DEIS.)

As noted above, the concerns regarding the 2008 Operating Agreement's Upstream Impacts have consistently been raised by the Commission. The Commission requested that Reclamation's analysis consider impacts on ESA issues, on Articles VI, VII and VIII of the Rio Grande Compact, and on upstream water supplies in correspondence dated April 30, 2012, Attachment D, in comments on the draft Supplemental EA (Attachment E, June 6, 2013 letter from the Commission to Reclamation), and again during scoping for the DEIS (Attachment A).

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No section in the DEIS describes or evaluates Upstream Impacts of any type. Potential Upstream Impacts should have been listed in the DEIS as a key issue and should have been described and evaluated, but were not. Similarly, under the "Resources Considered" section of the DEIS, Reclamation has failed to describe or evaluate the difference in effects among its alternatives on the operations of upstream reservoirs and, consequently, on the upstream human environment and resources including upstream endangered species-related water operations. Moreover, it failed to conduct this analysis even though impacts to special status species were among the key issues identified in the Supplemental EA prepared for the 2008 Operating Agreement and among the issues raised in comments received during internal and formal scoping and outreach for this DEIS (see DEIS § 1.13, at 1-16). The current lack of analysis with respect to Upstream Impacts is a glaring gap that undermines the ability of the DEIS to afford full public disclosure, to elicit meaningful public input, and to support informed federal agency decision making through the NEPA process.

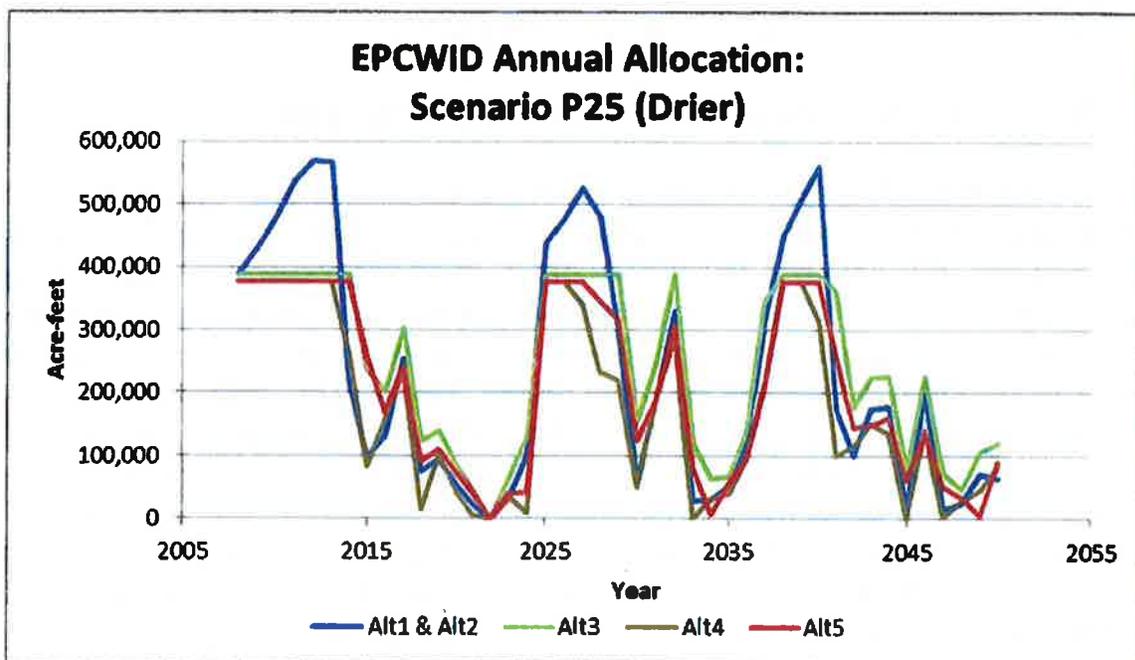
#### **IV. Reclamation Fails to Meet the Hard Look Standard.**

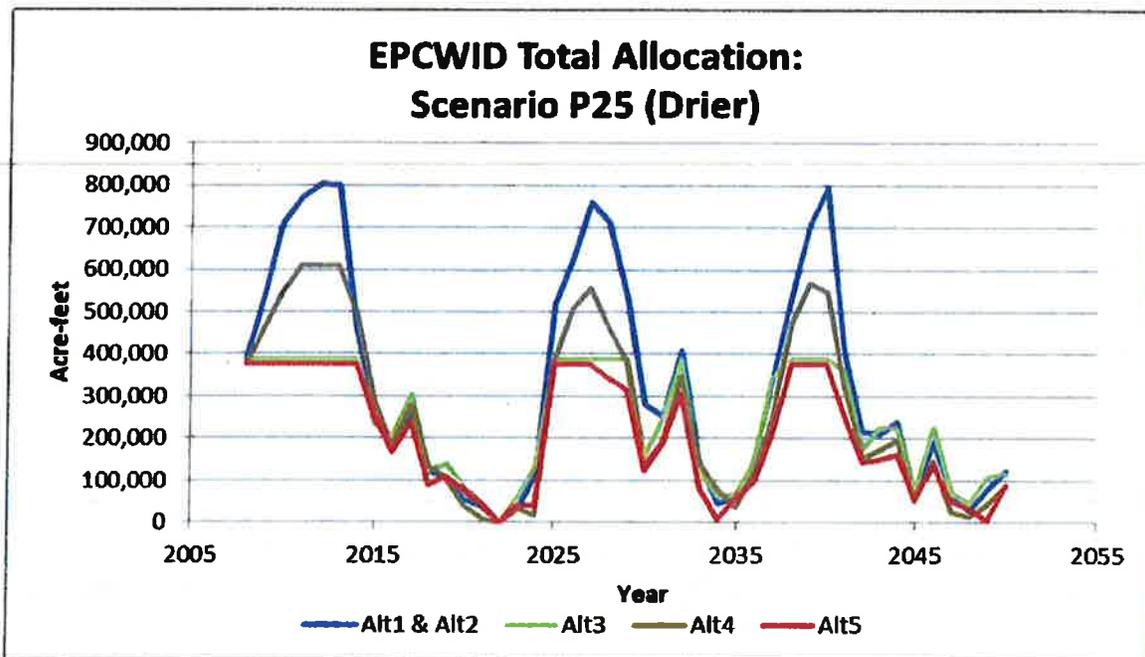
It is well established that NEPA requires federal agencies to take a "hard look" at the environmental consequences of a proposed action. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989). The environmental impact statement serves three purposes. First, it must inform decision makers about the environmental implications of a proposed action in sufficient detail to aid in making the substantive decision of whether to proceed with the action. Second, the statement must be sufficiently detailed and available to provide the public with a meaningful disclosure of the proposed action's environmental impacts. And third, the environmental impact statement must demonstrate that a reasonable range of alternatives was developed and considered. See generally *Weinberger v. Catholic Action of Hawaii*, 454 U.S. 139 (1981). Along with all of the above comments, the items highlighted below make clear that Reclamation has not examined the 2008 Operating Agreement in sufficient detail to make an informed decision on how to proceed and has failed to provide the public with meaningful disclosure of the true impacts of the proposed action. For these reasons, the Commission requests preparation of a supplemental draft environmental impact statement.

### A. Reclamation's Modeling Outputs Contain Flaws.

19 As noted above, the Commission could not do a comprehensive review of Reclamation's hydrologic model because the information requested was not made available. That said, based on the information the Commission does have, it is clear that some of the modeling outputs in the analysis are flawed.

Allocation results from Reclamation's simulation of the 2008 Operating Agreement allocation procedures (Alt1 & Alt2 provided in Appendix A, Allocation.xlsx, with example figures shown below) show simulated annual allocations for EPCWID greater than 500,000 AF in several years. This is significantly higher than EPCWID's maximum annual allocation under the 2008 Operating Agreement (388,000 AF). (Note: Annual Allocation excludes Carryover Allocation. EPCWID's Total Allocation including Carryover is simulated to reach 800,000 acre-feet.) These results indicate that the allocation algorithm used in the modeling analysis is not correct, and therefore the evaluation process does not accurately represent the 2008 Operating Agreement procedures. Erroneous calculation of EPCWID's allocation will cause erroneous calculations of diversions, carryover, carryover transfer, etc., impacting all model results. Lacking full documentation and source codes for the SWOPS part of the model, the Commission cannot comment further concerning this issue at this time.





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Additionally, all of the DEIS modeling scenarios assume that New Mexico will relinquish its Compact credit water in EBR if these Credits exceed 70,000 AF. The Commission disagrees with this assumption; proposing relinquishment of New Mexico Compact credit water is a decision of the New Mexico Compact Commissioner, not Reclamation. Moreover, the assumption is not reasonable given the current litigation regarding Compact credit water in EBR. Including this assumption as part of the simulated scenarios causes the model to overestimate the amount of water available to the Project, and therefore minimizes the impact of the 2008 Operating Agreement at the potential expense of New Mexico's upstream of EBR. Because the information necessary to examine the model in full was not provided, the Commission is unable to suggest methods to alleviate these flaws.

21

Finally, under Alternative 1, the total groundwater pumping under P50 conditions for the City of El Paso is 11,575 AF per year. Similar numbers are provided for the other alternatives. These numbers cannot be correct. The City of El Paso itself reports that it is using and will continue to use 25,000 AF per year from the Mesilla Bolson and Hueco Bolson. See [http://www.epwu.org/water/water\\_resources.html](http://www.epwu.org/water/water_resources.html).

**B. The DEIS Analysis Fails to Adequately Examine the Decrease in Project Supply to EBID.**

The DEIS does not give sufficient weight to the significant decrease in Project water supply to EBID demonstrated by Reclamation's 2015 technical memorandum (Appendix

C of the DEIS). What is most striking about this omission is that while the technical findings obtained in the analysis for the DEIS clearly demonstrate the reduction in

Project water supply to EBID (Appendixes A and C of the DEIS), the text of the DEIS makes no mention of this enormous decrease. Specifically, the 2015 technical memorandum (Appendix A) demonstrates that the simulated average annual allocation to EBID under pre-OA operations (Alternative 5) was 314,327 AF, while under the 2008 Operating Agreement it was only 146,977 AF. This 167,350 AF reduction in EBID's average annual allocation is only 53% of pre-OA levels simulated in Alternative 5. Similarly, and also from Table 4-6, the average Farm Delivery of Project water to EBID farmers is simulated to change from 110,314 AF for pre-OA operations to 72,841 AF under the 2008 Operating Agreement, a reduction of 34%.

There are other modeling results from the DEIS that also show the large reduction in EBID supply caused by the 2008 Operating Agreement. Spreadsheets in Appendix A of the 2015 USBR Tech Memo No. 86-68210-2015-05 (DEIS Appendix C) ("Tech Memo") provide year-by-year model output. Data in ALLOCATION.xlsx show that EBID's Annual (or current year) allocation under the 2008 Operating Agreement (Alt1 & Alt2) is simulated to be lower than EBID's allocation under pre-OA operations (Alt 5) by very large amounts; as much as 460,000 AF, as shown in the EBID Annual Allocation graph below.<sup>13</sup>

The reduction of EBID's Annual Allocation is only partially mitigated by the potential benefit of carryover transfer from EPCWID, which is included in the Total Allocation shown in the graph below (Total Allocation includes both Annual Allocation and Carryover Allocation). Even this small mitigation is not guaranteed. Carryover transfer only occurs if EPCWID does not order a large part of its allocation and continues to accrue credit. If EPCWID increases its annual Project diversions above the levels assumed in the Tech Memo, then the resulting Carryover transfer would be much lower, and EBID's Total Allocation would be closer to its Annual Allocation. Note that these modeling results are in part suspect because of the questions raised in comment A (above) relating to the simulation of EPCWID's Annual Allocation. Since the model overestimates EPCWID's allocation, it is likely that the model also overestimates Carryover Allocation Transfer from EPCWID to EBID.

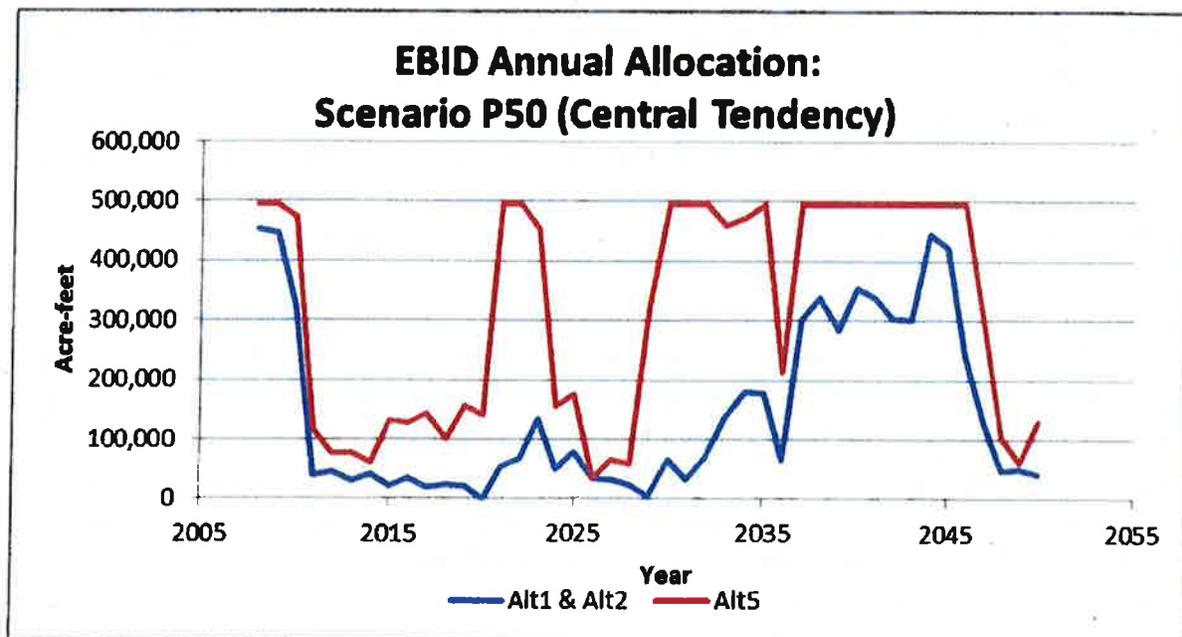
The large reductions in EBID's allocation predicted by the DEIS model are generally consistent with New Mexico's first amended complaint against Reclamation in *New Mexico v. United States*, No. 11-cv-00691-JAP-WDS (D.N.M., 2011). In Paragraph 48.b.

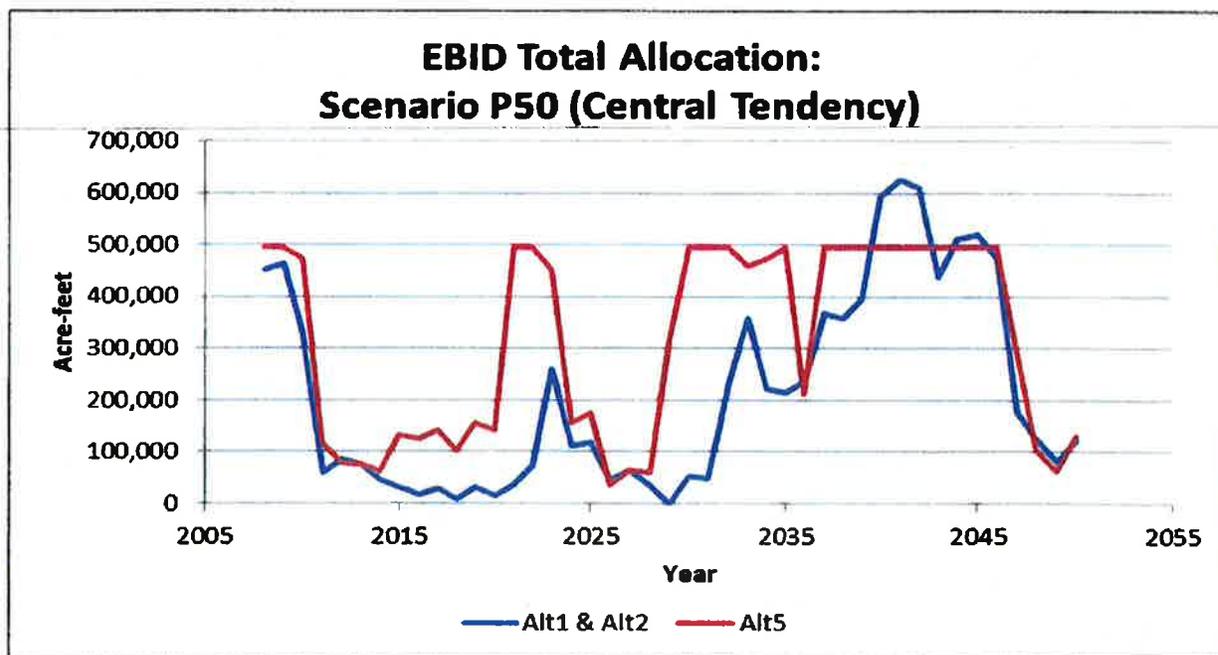
<sup>13</sup> The below graphs were extracted from Reclamation's Appendix A in the DEIS, ALLOCATION.xlsx, and modified for clarity by removing the curves for Alt3 and Alt4. The Summary Chart is taken directly from the DEIS without modification.

of its first amended complaint, New Mexico discusses the large decrease in EBID allocations that had already been observed at that time: *“EBID has incurred a decrease in annual Rio Grande Project allocations in the range of 149,160 up to 189,110 acre-feet, or -30.1% to -38.2% of its historical allocation. This decrease in allocation reflects operations that occurred during the past three years [2008, 2009 and 2010] as accounted by Reclamation.”* Again, failing to highlight the findings of the DEIS modeling in the text is a glaring omission.

Table 4-6. Summary of the No Action Alternative Compared with the Other Alternatives

	Alternative 1—No Action	Alternative 2—No San Juan—Chama Project Storage	Alternative 3—No Carryover Provision	Alternative 4— No Diversion Ratio Adjustment	Alternative 5— Prior Operating (Ad Hoc) Practices
<b>Section 4.4</b>					
<b>Surface Water</b>					
Elephant Butte pool elevation (feet)	4,318	4,312	4,314	4,312	4,313
Total project storage (average annual acre-feet)	409,453	409,453	399,510	371,591	389,109
Annual allocation to EBID	146,977	146,977	264,752	272,269	314,327
Annual allocation to EPCWID	266,327	266,327	267,973	207,296	239,317
Project releases (mean annual acre-feet)	524,597	524,597	525,808	531,229	527,421
Net diversions to EBID (acre-feet)	153,583	153,583	198,287	227,069	228,363
Net diversions to EPCWID (acre-feet)	46,703	46,703	34,805	29,491	25,543
Farm surface water deliveries to EBID (acre-feet)	72,841	72,841	94,477	110,782	110,314
Farm surface water deliveries to EPCWID (acre-feet)	15,954	15,954	15,029	14,964	13,896
<b>Section 4.5</b>					
<b>Groundwater</b>					
Mean monthly elevation at Rm-2 (feet)	4,060	4,060	4,062	4,063	4,063
Mean monthly elevation at Mes-6 (feet)	3,814	3,814	3,815	3,816	3,815
Groundwater storage in the Rincon and Mesilla Basins (cumulative change)	Decrease	Decrease	Decrease	Decrease	Decrease
<b>Section 4.6</b>					
<b>Water Quality</b>					
Groundwater elevations decline seasonably during sustained dry periods but recover during wet periods	Negligible	Negligible	Negligible	Negligible	Negligible





**C. The DEIS Groundwater Supply and Quality Analysis is flawed.**

1. *Groundwater Supply*

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The DEIS downplays the impact on the shallow groundwater aquifer levels in New Mexico caused by the 2008 Operating Agreement. The DEIS hydrologic analysis suggests that under P50 and P75 climatic scenarios the aquifer will recover, however it is likely that the SWOPS modeling flaw described above (Comment A above) has led to under-estimation of the impact on the shallow groundwater aquifer. It should be noted that observed shallow ground water levels have already dropped 20 feet since the beginning of 2006, the year that Reclamation first reduced EBID's allocation by the diversion ratio method. (See Figure below: Final report to the New Mexico Legislature Interim Committee on Water and Natural Resources, by New Mexico Universities Working Group on Water Supply Vulnerabilities, August 31, 2015).

Reclamation's language in the DEIS demonstrates its bias on this issue. On page 3-12 of the DEIS, Reclamation, citing only its prior work, states "[a]nalysis based on historical measurements of groundwater elevations from monitoring wells in the RGP and surrounding areas of the Rincon and Mesilla Valleys demonstrates widespread and statistically significant negative trends in groundwater elevation from 1980 to the present. However, additional analysis of previous decades suggest that this trend is confined to the past decade, indicating that sustained groundwater pumping in excess of recharge (i.e., groundwater mining) was not prevalent in the RGP or adjacent lands

23 cont.

before the current drought (Reclamation 2013a; SEA Appendix F).” This statement fails to acknowledge the realities of water supply under the 2008 Operating Agreement and realistic, historical groundwater trends. Groundwater level trends before 2006 show a consistent historical trend: groundwater declines of 10-15 feet during drought, followed by recovery in full supply years. Since 2006 groundwater levels have shown no recovery during years of full supply to the Project (2008, 2009 and arguably 2010), followed by further decline during the following time of shortage. In short, the effect of the 2008 Operating Agreement is to convert a sustainable aquifer into a mined aquifer.

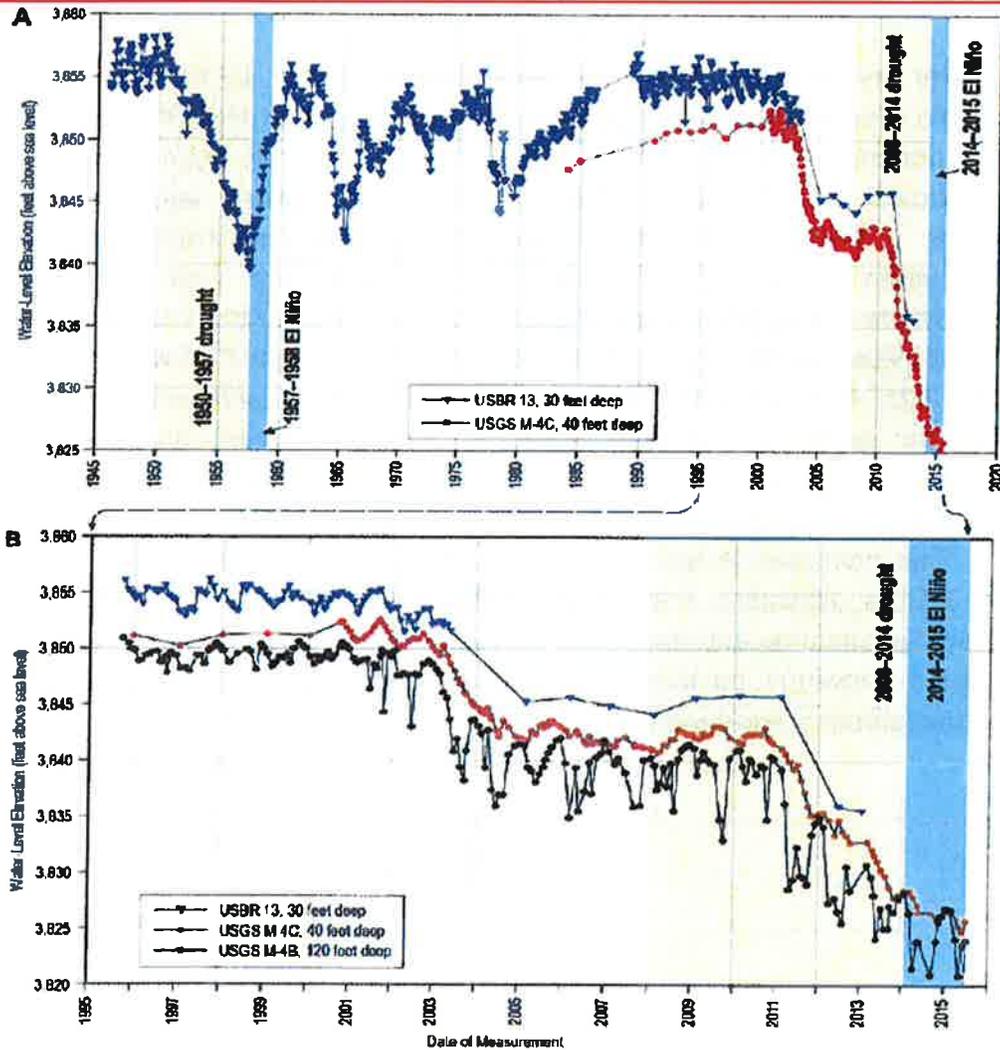


Figure 9. Hydrographs from wells USBR 13, M-4C, and M-4B are used to evaluate the effects of groundwater pumping and drought in the lower Mesilla Valley. A. The combined hydrograph (1946–2015) shows a 16-foot water-level decline and recovery during the 1950–1957 drought, a 16-foot water-level decline during the 2008–2014 drought, and a 7.5-foot decline between winter measurements in 2003–2005 prior to drought conditions. B. Seasonal water-level fluctuations in the 1995–2015 hydrograph for M-4B shift from a pattern of summer recharge to one of summer groundwater pumping during 2002–2003, indicating the pre-drought decline was due to groundwater pumping. The water level declined 26 feet from 2002 to June 2015 and the aquifer had not yet recovered from the combined effects of pumping and drought.

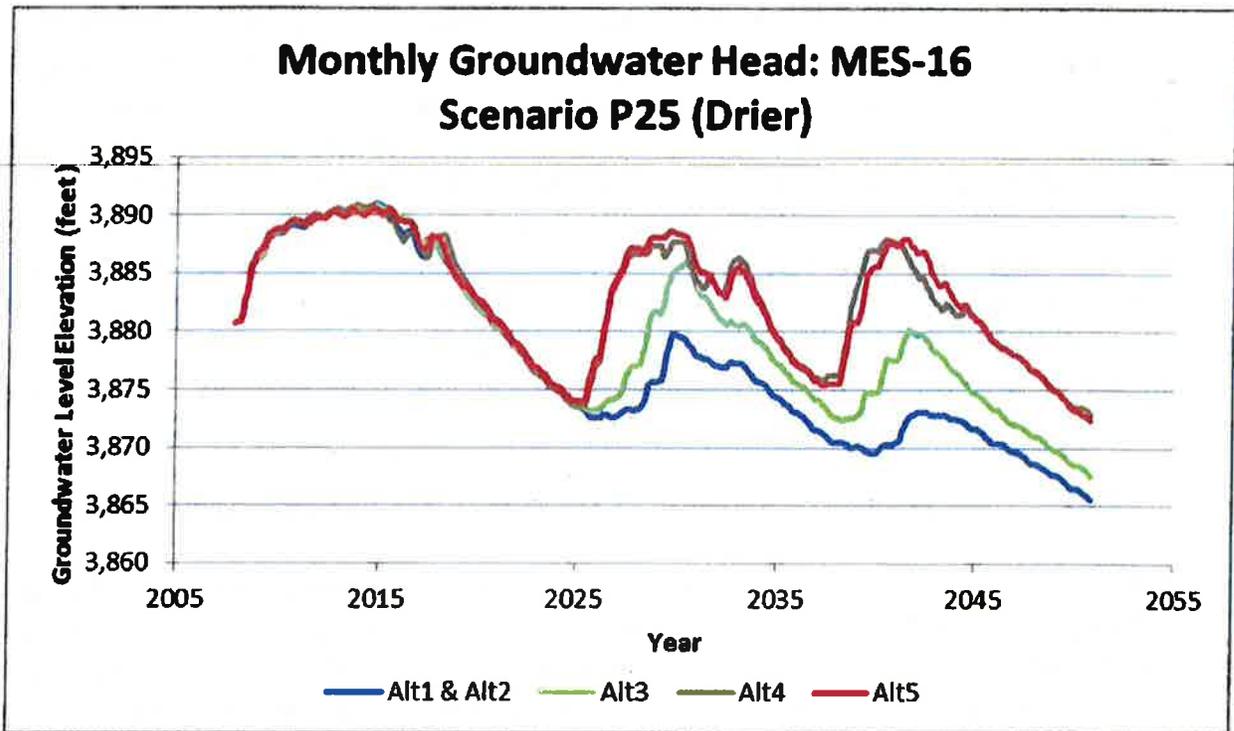
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Moreover, the DEIS modeling itself shows significant groundwater supply issues. Under the P25 climatic scenario, the DEIS shows that the groundwater levels will experience a drop of about 25 feet (Head.xlsx, Mes-16) under Alternatives 1 and 2 which will be on top of the already observed 20 foot drop since early 2006, see the figure below. This drop in the shallow groundwater levels represent a significant impact on groundwater resources in New Mexico that, just as with the lower Project supply numbers, is not mentioned in the text of the DEIS. Instead, the presentation of groundwater level results in the body of the DEIS is cursory, providing only an average groundwater level over a 40+ year period, and not discussing the actual predicted groundwater level declines.

Groundwater hydrographs found in Appendix A of the DEIS, HEAD.xlsx, show considerable drawdowns in some scenarios, drawdowns that should be added to those already experienced within EBID. Note that the P25 Scenario hydrograph for MES-16 (below) shows that for the 2008 Operating Agreement allocation alternative (Alternatives 1 and 2) the aquifer is being depleted unsustainably, i.e., drawdowns during dry years that do not recover in intervening wet years. This again is a concern that New Mexico has raised in *New Mexico v. United States*, No.11-cv-00691-JAP-WDS (D.N.M. 2011)(see Document 100-1, Filed 06/13/2012, Affidavit of Margaret Barroll: “*In effect, the 2007 OP and 2008 OA have converted a sustainable aquifer system into a mined aquifer system.*”) A vicious cycle has begun, in which low apparent Project performance reduces EBID’s supply (through the Diversion Ratio Allocation), thus causing complementary reductions in aquifer recharge due to increases in groundwater pumping. This increased stress on the aquifer may further impact Project performance, reducing EBID’s allocation even more. While Reclamation’s modeling confirms the Commission’s concerns and the cycle, the DEIS fails to account for the problems in its review, again showing it has failed to truly take a hard look at the environmental effects of the 2008 Operating Agreement.<sup>14</sup>

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<sup>14</sup> On Page 3-12 of the DEIS Reclamation also states that “[i]t is likely that recent groundwater declines are associated with the severe and sustained drought conditions that have affected the RGP since 2003 (Reclamation 2013a; SEA Appendix F). Again, the Commission disagrees. Based on the above analysis it is clear that these declines, while certainly enhanced by natural drought, have been compounded by reductions to EBID’s allocation under the 2008 Operating Agreement.



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Finally, in regard to groundwater supply, the DEIS does not consider any limitation or insufficiency in groundwater pumping capacity within EBID, either at present, or that may occur in the future, and instead assumes that any deficit in EBID's Project supply can, and always will be, compensated for by groundwater pumping. This is an erroneous assumption. In fact, not all EBID farmers have wells, there is an increase in cost associated to pump the wells as groundwater levels drop, and in some areas groundwater supplies are limited or groundwater quality can limit the usefulness of irrigation wells.

## 2. Groundwater Quality

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The DEIS water quality analysis is also limited, again demonstrating that Reclamation did not conduct a meaningful review of all the environmental impacts of the 2008 Operating Agreement. Modeling did not contain information about groundwater quality or potential sources of contamination. Salinity is mentioned only briefly under existing conditions, but not evaluated under the alternatives. In particular, the DEIS does not consider the impact of the difference in quality between groundwater and surface water, specifically as it relates to farm productivity. EBID farmers have informed New Mexico that they are unable to germinate some crops with the lower quality groundwater available in their area, and other farmers report that when forced to use groundwater they are unable to grow crops of the same size and quality that they could with surface water (e.g. onion crops in the Rincon Valley). Therefore, the impact of a low surface

26 cont.

water allocation to EBID is not merely that the farmer has to pump groundwater, but also that the farmer may not be able to grow certain crops, or that the yield and quality of the crop may be reduced. This should have been included in the DEIS analysis. Second, the DEIS did not analyze the effects on groundwater quality of EBID's large surface water allocation reductions under the 2008 Operating Agreement. Irrigation processes normally concentrate naturally occurring salts. Without sufficient Project water to flush these salts, they will remain in the soil and shallow aquifer. The DEIS has not considered how this change in groundwater quality will impact EBID farmers, or other groundwater users. In other words, the DEIS has not considered the long term effects of salinization of the Mesilla and Rincon valley aquifers, an environmental consequence of the 2008 Operating Agreement.

#### **D. Reclamation's Analysis of Alternative 1 Is Fundamentally Flawed.**

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In its examination of Alternative 1, Reclamation fails to evaluate the full scale of what is included in the 2008 Operating Agreement. The DEIS evaluated the diversion ratio adjustment and carryover accounting provisions only. DEIS, pg. 2-3, lines 77-81. Whereas many additional changes to Project operations can occur under the 2008 Operating Agreement. For example, the 2008 Operating Agreement allows for release of both annual allocations (current year allocations) plus carryover allocation amounts for both Districts. These total allocations could amount to more than 1,400,000 AF per year. However, all DEIS model simulations limit releases from Caballo reservoir to 790,000 AF (files received from Reclamation, Notes.txt, under FMP subdirectory), significantly less than the 1,400,000 AF per year releases allowed for under the 2008 Operating Agreement. This discrepancy clearly demonstrates that the DEIS evaluation does not evaluate the full scale of operations that could occur under the 2008 Operating Agreement. Further, as has been noted above, the impacts of the 2008 Operating Agreement on water management and deliveries under the Compact have not been considered, another fundamental flaw in the analysis of Alternative 1.

#### **E. Reclamation Failed to Address the Operations Manual.**

As discussed briefly above, the DEIS completely ignores the Project Operations Manual. The Operations Manual does more than merely implement the 2008 Operating Agreement; Reclamation has unilaterally imposed material changes in the operation of the Project through modifications to the Operations Manual that have adversely affected the deliveries to New Mexico and created a false assessment of the Project's water allocations and environmental impacts. For example, a "drought factor" was added to the Operations Manual in May 2012 to reduce the D2 allocation in multiple drought years. Other changes to the Manual are listed in Attachment F. These changes were not analyzed in prior environmental analyses and have not been analyzed in the DEIS.

Material changes to the Operations Manual should be evaluated under NEPA whether or not there is a corresponding formal change to the 2008 Operating Agreement. See *Kunaknana v. U.S. Army Corps of Eng'rs*, 23 F. Supp. 3d 1063 (D. Alaska 2014) (rejecting agency's argument that an supplemental environmental impact statement ("SEIS") was unnecessary where a modified project was "conceptually similar" to the original project; relocation of a well pad to a new site over a mile away, a 50% increase in the number of wells, and a new road alignment and bridge crossing were substantial changes requiring preparation of an SEIS). Thus, by not conducting this analysis here, Reclamation has again failed at taking a hard look at the environmental impacts in the DEIS.

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Of greatest concern is that in addition to the changes already implemented through the Operations Manual, there is no known preclusion or bar to implementing more changes in the future.<sup>15</sup> For example, all of the following may be changed based on amendments to the Operations Manual: delivery points to EBID, EPCWID and Mexico; flood water diversions; accounting and charges procedures, including how credits are estimated; shortage sharing procedures; and, the end-date of the allocation process. The DEIS does not contain any analysis of these issues. The Council on Environmental Quality's NEPA implementation regulations require preparation of a SEIS if (1) "[t]he agency makes substantial changes in the proposed action relevant to environmental concerns" or (2) "[t]here are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts." 40 C.F.R. § 1502.9(c)(1). A change is substantial where it "presents a seriously different picture of the environmental impact" of the action. *In re Operation of Mo. River Sys. Litig.*, 516 F.3d 688, 693 (8th Cir. 2008). The Circuit Courts have considered whether the modification (1) affects a primary or secondary aspect of the proposed project, (2) is major or minor in scope, and (3) will have environmental impacts that the agency has not yet considered. See, e.g., *Russell Country Sportsmen v. U.S. Forest Serv.*, 668 F.3d 1037, 1048-49 (9th Cir. 2011). The Commission asserts that Reclamation has failed to analyze any of the impacts of the Operations Manual and a supplemental draft environmental impact statement is required.

<sup>15</sup> An additional concern is that the Operations Manual can be changed simply by agreement of the three parties to the 2008 Operating Agreement: Reclamation, EBID and EPCWID. Because any change under the Operations Manual necessarily involves a federal action, in principle each substantive change would require an analysis under NEPA, however none of the changes to date received this analysis until they were incorporated into the DEIS, which then carried out an incomplete analysis of those changes. The DEIS should explicitly recognize the possibility that changes have occurred, determine whether there were environmental impacts, discuss what future changes may be likely, and set a framework for the types of changes that require additional NEPA analysis and those that will not. Additionally, the Commission continues to raise concerns that the non-public meetings of these three entities to change the Operations Manual along with the process to amend the Manual violate the Federal Advisory Committee Act. 5 U.S.C. Appendix – Federal Advisory Committee Act; 86 Stat. 770, as amended.

## **F. Reclamation's ESA Analysis is Flawed**

Federal agencies should prepare "draft environmental impact statements concurrently with and integrated with environmental impact analyses. . .required by. . . the Endangered Species Act [ESA]." 40 C.F.R. § 1502.25. Here on November 18, 2015 a Biological Assessment ("BA") was submitted by Reclamation to the United States Fish and Wildlife Service (the "Service") to describe the proposed action and determine whether it "may affect" listed species or critical habitat in a manner justifying the initiation of formal ESA Section 7 consultation. The Service's Biological Opinion ("BO") is the concluding document for the ESA Section 7 consultation, and Reclamation is charged with considering the information in the BO as part of making its final decision. Unfortunately, the majority of the Commission's comments in this letter regarding the Section 7 consultation are related to the BA. That's because the BA is the only document the Commission had available to review regarding the consultation until the BO was made public on June 3, 2016, four business days before the close of the comment period for the DEIS.

The Commission repeatedly requested a copy of the BO starting on March 31, 2016. See Attachment G. In fact, the Commission requested the BO five times through Reclamation's official communications channel described in the notice federal register notice of availability. See Attachments B, G, and H. To date, the Commission has received no official administrative record communication from Reclamation notifying it of the public availability of the BO. And, while the BO is now on the Service's website, as of June 3, 2016, Reclamation has not updated its own website to notify the public of its availability.

Withholding the BO until this late date contradicted Reclamation's statements to the public regarding the BO. The notice of availability published March 18, 2016 stated that the BO was available at a listed URL address. However, contrary to the published notice of availability, the BO was not available on the listed website or through any other means. It did not become available until the date listed above, over two months after the notice of availability was published.

That said, the Commission has endeavored to comment on the BO as part of this letter. While the Commission has done its best in this short time frame, we reserve the right to supplement these comments if the Commission determines additional comments on the BO are warranted. The Commission will submit these additional comments by July 5, 2016, a reasonable period of time.

The most striking issue with the BO is the action area listed in the document. Under the ESA, the "action area" for the analysis of effects must address "all areas affected