

No. 141, Original

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In the  
SUPREME COURT OF THE UNITED STATES

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STATE OF TEXAS,

Plaintiff,  
v.

STATE OF NEW MEXICO and  
STATE OF COLORADO,

Defendants

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OFFICE OF THE SPECIAL MASTER

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UNITED STATES OF AMERICA'S SECOND SUPPLEMENTAL DISCLOSURE OF  
EXPERT WITNESS JEAN M. MORAN, STETSON ENGINEERS, INC.

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Pursuant to Fed. R. Civ. P. 26(a)(2)(E) and 26(e)(2), and the Case Management Plan executed by the Hon. Michael J. Melloy, Special Master, on September 6, 2018, and amendments thereto, Plaintiff United States of America hereby supplements its May 31, 2019 Disclosure of Expert Witness Information, its September 17, 2019 Supplemental Disclosure of Expert Witness Information, and any supplements thereto.

The United States' Second Supplemental Disclosure of Expert Witness Information supplements previous information, documents, files, and data disclosed by Jean M. Moran, Supervising Hydrogeologist with Stetson Engineers, Inc. The data and information comprising this Supplemental Disclosure includes additional modeling data and files. This production was made by depositing the supplemental documents into the Box.com repository. The documents deposited in the box.com repository may now be downloaded by persons who set up accounts for the use of this service. In addition, the United States understands that the documents will be transferred to the Veritext system by third parties.

The United States reserves the right to further supplement its disclosure if and when additional documents are identified.

Respectfully submitted this 6th day of May, 2020,

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CERTIFICATE OF SERVICE

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This is to certify that on the 6th day of May 2020, I caused a true and correct copy of **UNITED STATES' SECOND SUPPLEMENTAL DISCLOSURE OF EXPERT WITNESS JEAN M. MORAN, STETSON ENGINEERS, INC.** to be served via electronic mail and/or U.S. Mail as indicated, upon those individuals listed on the Service List, attached hereto.

Respectfully submitted,

*/s/ Seth Allison* \_\_\_\_\_

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**STATE OF TEXAS,**

**Plaintiff,  
v.**

**STATE OF NEW MEXICO and  
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**Defendants**

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**OFFICE OF THE SPECIAL MASTER**

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**UNITED STATES OF AMERICA'S DISCLOSURE OF  
EXPERT WITNESSES**

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Pursuant to Section 6.2.2 of the September 10, 2018 Case Management Plan, as amended, and Fed. R. Civ. Pro. 26(a)(2), the United States of America (“United States”) respectfully discloses its expert witnesses, as follows:

I. Jean M. Moran, P.G., C. Hg., Senior Hydrogeologist, Stetson Engineers, Inc., 785 Grand Ave., Suite 202, Carlsbad, CA 92008. Ms. Moran will provide expert testimony on the subjects of surface water-groundwater interaction, hydrogeologic modeling with respect to the Rincon and Mesilla Valleys including the Rio Grande Project area, and the impacts on Rio Grande flows of groundwater pumping in New Mexico. Pursuant to Fed. R. Civ. P. 26(a)(2)(B)(i)-(vi), a written report prepared and signed by Ms. Moran is submitted concurrently herewith. Electronic copies of the references listed in her report, including model code and files that she reviewed, have been transmitted directly to Veritext on a hard or flash drive for uploading to the Veritext Vault.

II. Nicolai Kryloff, Project Historian, Historical Research Associates, Inc., 419 Seventh Street, NW, Suite 403, Washington, D.C., 20004. Mr. Kryloff will provide expert testimony on the history of the Rio Grande Compact, the history of the Rio Grande Project, and the history of surface water and groundwater development below Elephant Butte Reservoir. Pursuant to Fed. R. Civ. P. 26(a)(2)(B)(i)-(vi), a written report prepared and signed by Mr. Kryloff is submitted concurrently herewith. Mr. Kryloff has not previously testified as an expert at trial or by deposition.

III. Ian M. Ferguson, Ph.D., P.E. Dr. Ferguson is a Hydrologic Engineer from the Bureau of Reclamation’s Technical Service Center, Water Resources Engineering and Management Group, in Denver, Colorado, whose ordinary duties do not include providing expert testimony. For his work on this matter, Dr. Ferguson has received no compensation in addition to the salary he receives as a federal employee.

A. Subject Matter

Under Fed. R. Civ. P. 26(a)(2)(C)(i), Dr. Ferguson will provide testimony on the current operations of the Rio Grande Project (“Project”) including the following: (1) Project operations under

the 2008 Operating Agreement for the Rio Grande Project and the Rio Grande Project Water Accounting and Operations Manual; (2) Procedures for allocating Project water, including the use of the D-1 and D-2 curves; (3) Procedures for Project water accounting, including the determination of Project allocation charges and credits; (4) and the Project’s release and delivery of water from storage to Project districts and Mexico. *See* Fed. R. Civ. P. 26(a)(2)(C)(ii).

B. Summary of the Facts

The allocation procedure under the Operating Agreement ties the allocation to the United States of water for delivery to Mexico and to the El Paso County Water Conservation District No. 1 (“EPCWID”) to historical conditions through the D1 and D2 curves, respectively. Both curves are based on historical data from 1951-1979 and thus reflect historical conditions during this period. Under the Operating Agreement, allocations to the Elephant Butte Irrigation District (“EBID”) employ a diversion ratio adjustment that, in effect, “charges” EBID for the difference between the amount of water that would be available for diversion in a given year under historical conditions, as estimated by the D2 curve, and the amount of water that is available for diversion during that year. The “charge” is factored into the allocation procedure rather than applied as an allocation charge in Project accounting, which ensures that allocations to EPCWID and Mexico remain consistent with historical conditions.

C. Summary of Opinions

Dr. Ferguson will offer opinions on whether the D1 and D2 curves are an appropriate basis for determining Project allocations to EPCWID and Mexico consistent with historical conditions, and whether the diversion ratio adjustment is a reasonable and appropriate methodology for determining Project allocations to EBID. Dr. Ferguson will also offer opinions on the allocation and accounting of Project water under the 2008 Operation Agreement, including carryover accounting.

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Respectfully submitted this 31st day of May, 2019,

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**Defendants**

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**CERTIFICATE OF SERVICE**

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This is to certify that on the 31st day of May, 2019, the **UNITED STATES OF AMERICA'S DISCLOSURE OF EXPERT WITNESSES** was served via electronic mail and/or U.S. mail as indicated, upon the individuals listed on the Service List, attached hereto.

Respectfully submitted,

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**No. 141, Original**

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**In the  
SUPREME COURT OF THE UNITED STATES**

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**STATE OF TEXAS,**

**Plaintiff,  
v.**

**STATE OF NEW MEXICO and  
STATE OF COLORADO,**

**Defendants**

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**OFFICE OF THE SPECIAL MASTER**

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**UNITED STATES OF AMERICA'S SUPPLEMENTAL DISCLOSURE  
OF EXPERT WITNESS IAN M. FERGUSON**

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The United States respectfully submits this supplement to its May 31, 2019 Disclosure of Expert Witness Ian M. Ferguson, as follows:

III. Ian M. Ferguson, Ph.D., P.E. Dr. Ferguson is a Hydrologic Engineer from the Bureau of Reclamation's Technical Service Center, Water Resources Engineering and Management Group, in Denver, Colorado. Since June 2011, Dr. Ferguson has provided technical support to Reclamation's Albuquerque Area Office on issues related to Rio Grande Project ("Project") operations, including review and documentation of Project allocation and accounting procedures, quality assurance and quality control of Project allocations and water accounting; and data analysis and numerical modeling. Dr. Ferguson has also assisted in preparing and reviewing updates to the Rio Grande Project Water Accounting and Operations Manual. In addition, Dr. Ferguson assisted the United States Geological Survey in developing a new integrated hydrologic model of the Rincon and Mesilla Valleys. Dr. Ferguson's ordinary work duties do not include providing expert testimony. For his work on this matter, Dr. Ferguson has received no compensation in addition to the salary he receives as a federal employee.

A. Subject Matter

Under FED. R. CIV. P. 26(a)(2)(C)(i), Dr. Ferguson will provide testimony on the current operations of the Project under the 2008 Operating Agreement for the Rio Grande Project ("Operating Agreement") and the Rio Grande Project Water Accounting and Operations Manual ("Operations Manual") including the following; (1) Procedures for allocating Project water, including the use of the D-1 and D-2 curves and carryover accounting; (2) Procedures for Project water accounting, including the determination of Project allocation charges and credits; (3) and the Project's release and delivery of water from storage to Project districts and Mexico. *See* FED. R. CIV. P. 26(a)(2)(C)(ii).

B. Summary of the Facts

Project operations are carried out according to terms and procedures specified in the Operating Agreement, Operations Manual, and existing contracts and agreements between Reclamation, Elephant Butte Irrigation District (“EBID”), and El Paso County Water Conservation District No. 1 (“EPCWID”).

The Operating Agreement specifies how the United States allocates water to Mexico and to EPCWID using the D1 and D2 Curves, respectively. Reclamation determines the annual allocation to the United States for delivery to Mexico using the D1 Curve, which is a linear regression equation between historical annual Project releases and historical annual Project deliveries. Reclamation determines the annual allocation to EPCWID using the D2 Curve, which is a linear regression equation between historical annual Project releases and historical annual Project diversions. Both the D1 and D2 Curves were developed in the early 1980s based on historical data from the period 1951-1978.

The Operating Agreement specifies how the United States allocates water to EBID using the D2 Curve and the diversion ratio. The diversion ratio, as defined in the Operating Agreement, is the ratio of total annual allocation charges to EBID, EPCWID, and Mexico to the total release from Caballo Dam. If the total Project release for the current year is less than 600,000 acre-feet, the annual allocation to EBID is the lesser of its D2 allocation and its diversion ratio allocation; if the total Project release for the current year is greater than 600,000 acre-feet, the annual allocation to EBID is equal to its diversion ratio allocation. In years when the total Project release is less than 600,000 acre-feet and EBID’s diversion ratio allocation greater than its D2 allocation, each district’s allocation is adjusted based on the difference between EBID’s diversion ratio allocation and its D2 allocation.

The procedure used to compute annual allocations to EBID under the Operating Agreement effectively “charges” EBID for the difference between the amount of water that would be available for diversion in a given year under historical conditions, as estimated by the D2 curve, and the amount of water that is available for diversion during that year. The “charge” is factored into the allocation procedure, rather than applied as an allocation charge in Project accounting. The allocation procedure thus ensures that allocations to EPCWID and Mexico remain consistent with historical conditions as reflected by the D1 and D2 Curves.

Allocation charges and credits to EBID, EPCIWD, and to the United States for delivery to Mexico are computed based on metered flows and reflect the amount of water diverted and used by each entity. EPCWID also receives a credit for the estimated reduction in seepage losses achieved by conveying water to the heading of Riverside Canal via the American Canal Extension compared to conveying water via the channel of the Rio Grande.

Under the Operating Agreement, Reclamation releases Project water from Caballo Dam in accordance with water orders from EBID, EPCWID, and the United States section of the International Boundary and Water Commission (“US-IBWC”) on behalf of Mexico. Water orders for Mexico are determined by the Mexican Section of IBWC (“MX-IBWC”) and provided to Reclamation by US-IBWC. Water orders for EBID and EPCWID are determined and provided by each district, respectively. Water orders are limited by the allocation balance remaining on each entity’s respective Project water account. The quantity of water released from Caballo Dam to satisfy Project water orders is determined by EBID and EPCWID, in consultation with Reclamation, based on the total amount of water ordered and anticipated gains and losses to the Rio Grande between Caballo Dam and Project diversion points. Project diversion dams and canal headings are subsequently operated to execute diversions and

deliveries in accordance with water orders placed by EBID, EPCWID, and by US-IBWC for delivery to Mexico.

C. Summary of Opinions

Dr. Ferguson will offer opinions on whether the D1 and D2 curves are an appropriate basis for determining Project allocations to Mexico and EPCWID consistent with historical conditions, and whether the procedure for determining Project allocations to EBID is reasonable and appropriate.

Dr. Ferguson concludes that use of the D1 and D2 Curves is an appropriate basis to determine Project allocations to Mexico and EPCWID, respectively, because the Curves are based on historical Project operations during the period 1951-1978 and were subsequently used as the basis for determining Project allocations during the period from approximately 1981-2007. Dr. Ferguson concludes that the D1 Curve, as used in the Project allocation procedure, ensures that annual allocations to Mexico under the Operating Agreement are consistent with historical Project operations during the period 1951-1978. Dr. Ferguson concludes that the D2 Curve, as used in the Project allocation procedure, ensures that annual allocations to EPCWID under the Operating Agreement are consistent with historical Project operations during the period 1951-1978. Dr. Ferguson concludes that the D2 Curve reflects historical gains and losses to the Rio Grande between Caballo Dam and Project diversion headings. Historical gains and losses were influenced by numerous factors, including operation and maintenance of Project facilities, farming and irrigation practices within the Project and surrounding areas, and groundwater pumping in New Mexico and Texas.

Dr. Ferguson concludes that using the diversion ratio to determine Project allocations to EBID is reasonable and appropriate. The diversion ratio, as used in the Project allocation

procedure, ensures that annual allocations to Mexico and EPCWID remain consistent with historical conditions, as represented by the D1 and D2 Curves, and are not impacted by groundwater pumping or other changing conditions in New Mexico beyond those that occurred during the period 1951-1978. Use of the diversion ratio in computing Project allocations also ensures that allocations do not exceed the amount of water actually available for diversion and use, in terms of Project accounting, during the current year.

Dr. Ferguson will also offer opinions on the accounting of Project water under the 2008 Operating Agreement, including carryover accounting. Dr. Ferguson concludes that the procedures used to determine Project allocation charges and credits to EBID, EPCWID, and Mexico are reasonable and appropriate because these procedures are based on measured data; are consistent with historical water accounting procedures utilized since approximately 1982; reflect diversion and use of Project water by each entity; and incorporate provisions to promote efficient operations and water conservation and to penalize inefficient operations.

Dr. Ferguson concludes that for any given release from Caballo Dam, the amount of Project return flow under current hydrological conditions is less than it would have been for the same release under historical conditions. For any given release from Caballo Dam, the D2 Curve thus overestimates the amount of water actually available for diversion under current conditions and would result in a situation where Project allocations could not be met.

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Respectfully submitted this 16th day of September, 2019.

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OFFICE OF THE SPECIAL MASTER

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CERTIFICATE OF SERVICE

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This is to certify that on the 16th day of September, 2019, the **UNITED STATES OF AMERICA'S SUPPLEMENTAL DISCLOSURE OF EXPERT WITNESS IAN M. FERGUSON** was served via electronic mail and/or U.S. mail as indicated, upon the individuals listed on the Service List, attached hereto.

Respectfully submitted,

*/s/ Seth C. Allison* \_\_\_\_\_

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**No. 141, Original**

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**In the  
SUPREME COURT OF THE UNITED STATES**

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**STATE OF TEXAS,**

**Plaintiff,  
v.**

**STATE OF NEW MEXICO and  
STATE OF COLORADO,**

**Defendants**

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**OFFICE OF THE SPECIAL MASTER**

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**UNITED STATES OF AMERICA’S SUPPLEMENTAL DISCLOSURE  
OF EXPERT WITNESS JEAN M. MORAN, STETSON ENGINEERS,  
INC.**

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Pursuant to Rule 26(a)(2)(E) and 26(e)(2) of the Federal Rules of Civil Procedure, and the Case Management Plan executed by the Honorable Michael J. Melloy, Special Master, on September 6, 2018, and amendments thereto, the United States respectfully submits this supplement to its May 31, 2019 Disclosure of Expert Witness Information and any supplements thereto, as follows:

The United States Supplemental Expert Disclosure of Expert Witness Information supplements the expert witness information and documents, files, and data disclosed by United States Expert, Jean M. Moran, Supervising Hydrogeologist with Stetson Engineers, Inc.

In accordance with the Parties' agreements as to form, content, and service of responsive documents, the above referenced productions are comprised of production images, native files, OCR text files, and corresponding data (.dat) and image (.opt) load files. This production was made by depositing the supplemental documents into the Box.com repository. Counsel for the Parties previously should have received an email from Denis Fargas ([denis.fargas@usdoj.gov](mailto:denis.fargas@usdoj.gov)) with the Department of Justice's Office of Information Technology inviting joinder onto the Box.com system, and providing the necessary links and instructions. The documents deposited in the Box.com repository may now be downloaded by persons who set up accounts for the use of this service. In addition, the United States understands that the documents have been uploaded to the Veritext system by third parties.

Once shared by the repository manager, the United States Supplemental Expert Disclosure Production of Documents will be available for download by the Accessing Entities, as the term is defined in the Stipulation Regarding Procedure for Production of Documents and Electronically Stored Information (ESI), approved and duly entered by order of the Special Master on November 21, 2018.

The United States reserves the right to rely upon and use the testimony of any and all expert witnesses identified by all parties to this action and to present rebuttal testimony to any such witness through those listed here or other expert witnesses. The United States also reserves the right to amend or supplement this disclosure pursuant to Federal Rules of Civil Procedure 26(a)(2) and 26(e).

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No. 141, Original

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STATE OF TEXAS,

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STATE OF NEW MEXICO and  
STATE OF COLORADO,

Defendants

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OFFICE OF THE SPECIAL MASTER

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CERTIFICATE OF SERVICE

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This is to certify that on the 17th day of September, 2019, the **UNITED STATES OF AMERICA'S SUPPLEMENTAL DISCLOSURE OF EXPERT WITNESS JEAN M. MORAN, STETSON ENGINEERS, INC.** was served via electronic mail and/or U.S. mail as indicated, upon the individuals listed on the Service List, attached hereto.

Respectfully submitted,

*/s/ Seth C. Allison* \_\_\_\_\_

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**No. 141, Original**

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**In the  
SUPREME COURT OF THE UNITED STATES**

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**STATE OF TEXAS,**

**Plaintiff,  
v.**

**STATE OF NEW MEXICO and  
STATE OF COLORADO,**

**Defendants**

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**OFFICE OF THE SPECIAL MASTER**

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**UNITED STATES OF AMERICA'S DISCLOSURE OF REBUTTAL  
EXPERT DR. AL BLAIR**

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Pursuant to Fed. R. Civ. P. 26(a)(2)(C) and (D), and the Case Management Plan executed by the Hon. Michael J. Melloy, Special Master, on September 6, 2018, and amendments thereto, Plaintiff United States of America hereby designates Dr. Allie W. (“Al”) Blair, Ph.D., P.E., as a rebuttal expert, as follows:

I. Dr. Blair is a consultant to and serves as the District Engineer for El Paso County Water Improvement District No. 1 (“EPCWID”). In his capacity as a consultant and as the District Engineer Dr. Blair is responsible for EPCWID’s Rio Grande Project water accounting, design of water conservation projects, and other civil engineering work. He also serves as consulting engineer to Hudspeth County Underground Water Conservation District, Southern Trinity Groundwater Conservation District, Culberson County Groundwater Conservation District, and Brewster County Groundwater Conservation District. Dr. Blair has a B.S. in Agricultural Engineering from the University of Arizona at Tucson, a MS in Agricultural Engineering from Texas A&M University at College Station, and a PhD in Civil Engineering from the University of Texas at Austin. He is a licensed engineer in the State of Texas and the State of New Mexico. He is the president of Blair Farms, Inc. located in Dragoon, Arizona. For his work in this matter, Dr. Blair has received no compensation other than the compensation he receives from El Paso County Water Improvement District No. 1 in his capacity as a consultant and District Engineer.

II. Under Fed. R. Civ. P. 26(a)(2)(D), Dr. Blair will provide testimony in rebuttal to the opinions of Dr. Margaret (“Peggy”) Barroll, as set forth in Dr. Barroll’s expert report dated October 31, 2019 and served in No. 141, Original Action.

A. Basis for Dr. Blair’s Rebuttal Opinions.

Dr. Blair’s opinions are based on his work as consultant to and as the District Engineer for EPCWID for 28 years. He is the District’s representative to the Rio Grande Project

Allocation Committee and participated in the negotiations and drafting of the Rio Grande Project 2008 Operating Agreement (“Operating Agreement” or “OA”) and associated Operations Manual. In forming his opinions Dr. Blair relied on his experience as engineer and previous work done for EPCWID, other irrigation and groundwater districts, and irrigated farms in New Mexico and Texas; the records, data, and reports of the USGS, USBR, US-IBWC, the 2008 Operating Agreement, the Rio Grande Project Operating Agreement and Operations Manual, the Rio Grande Compact, the 1938 Joint Investigation Report, and generally recognized engineering and scientific principles, practices, and methods applicable to water resources, irrigation engineering and hydrology.

B. Opinions Regarding Report of Dr. Barroll:

1. Operating Agreement Caused Reduced “Surface Water Supply to New Mexico Farmers”

In her report at ix, Dr. Barroll’s conclusion number 1 states:

*The Rio Grande Project 2008 Operating Agreement has greatly reduced the surface water supply to New Mexico farmers, to the detriment of New Mexico. Texas, however, has benefitted by the 2008 Operating Agreement through an increase in the allocation of water to its irrigation district, and because that district can now carry over large amounts of unused allocation from one year to the next.*

Opinion: The Operating Agreement has not resulted in increased allocations to EPCWID above what EPCWID is entitled to from the Rio Grande Project. Any reduction in “surface water supply” to New Mexico farmers (Elephant Butte Irrigation District (“EBID”)) is less than the amount of water captured from the “surface water supply” by New Mexico groundwater pumping. One of the primary purposes of the 2008 Operating Agreement is to provide an allocation method that accounts for the amount of Project Water captured by groundwater pumped by New Mexico farmers and others in New Mexico. The fact that EPCWID conserves water for use in drought years by not using all of its allocated water in years of fully supply is a

responsible water management action that is not detrimental to New Mexico or EBID. The 2008 Operating Agreement has provisions that limit both EBID's and EPCWID's allocation balances and require transfer of any excess allocation balances to the other District.

2. From the beginning "each Project acre entitled to the same delivery of water"

In her report at ix, Dr. Barroll's conclusion number 2 states:

*The Rio Grande Project began delivering Project water in 1915. The two water Districts: Elephant Butte Irrigation District ("EBID," in New Mexico) and El Paso County Water Irrigation District No. 1 ("EPCWID," in Texas), were formed in the 1920s. The Rio Grande Compact was signed and took effect in 1938. From the beginning of Project Operations, each Project acre was entitled to the same delivery of water.*

Opinion: There is no requirement or document under the Rio Grande Compact or otherwise which directs that "each Project acre was entitled to the same delivery of water." The 1938 Joint Investigation Report specifically states that Texas should receive additional quantities of Project Water per acre of irrigable land to offset salinity problems resulting from irrigation practices in New Mexico and other sources which result in higher salinity water being delivered to Texas.

3. 1938 Contract regarding distribution of available supply

In her report at ix, Dr. Barroll's conclusion number 3 states:

*A 1938 Contract between the Districts sets forth a division of Project water supply between the Districts in accordance with the proportions of Project acreage: 88,000 of 155,000 Project acres (57%) to EBID, and 67,000 of 155,000 Project acres (43%) to EPCWID. From 1938 through 1978, Reclamation operated the Project so that EBID farmers were entitled to 57% of the U.S. share of Project Supply and EPCWID farmers were entitled to 43% of the U.S. share of Project Supply.*

Opinion: Dr. Barroll's conclusion misrepresents the 1938 Contract between EBID and EPCWID when understood in the context of Rio Grande Project operations and how allocations of Project Water are determined by Reclamation. One of the primary purposes of the 2008 Operating Agreement is to enforce the 1938 Contract to the extent it provided for relative allocations of Project Water supply sufficient to irrigate the irrigable acreage ("Project-Authorized Acreage")

within each District. EBID farmers receive Project Water from diversions of surface water from the Rio Grande and, without accounting for it, by capturing Project Water through groundwater pumping. The 2008 Operating Agreement limits the impact of New Mexico groundwater pumping on EPCWID's allocation of Project Water.

#### 4. 57% / 43% Started in 1979

In her report at ix, Dr. Barroll's conclusion number 4 states:

*Starting in 1979, Reclamation explicitly allocated Project Supply to the Districts in the ratio of 57% to EBID and 43% to EPCWID. The total amounts allocated were defined using the D1/D2 Curves. The amounts of water diverted by the Districts and delivered to their farmers were consistent with this 57:43 ratio.*

Opinion: Dr. Barroll's conclusion is factually incorrect. The allocation methods used by Reclamation have varied and evolved over the life of the Project (1906-2019) to promote water conservation and beneficial use of Project Water. From 1979 through 2002 neither the D1 nor D2 curves were used because both Districts and Mexico received full diversion allocations from Reclamation. From 2003 through 2007 Reclamation determined Mexico's diversion allocation from the D1 curve and used modified approaches based on the D2 curve and proposed methods by EBID and EPCWID. Since 2008 Reclamation has allocated according to the 2008 Operating Agreement.

#### 5. 2008 Operating Agreement required NM, CO, and Rio Grande Compact approval

In her report at ix, Dr. Barroll's conclusion number 5 states:

*In 2008 an Operating Agreement (the "2008 OA") was reached between Reclamation, EBID, and EPCWID without the involvement or approval of New Mexico, Colorado, or the Rio Grande Compact Commission, except for the participation of the Texas Compact Commissioner as a mediator.*

Opinion: This conclusion is incorrect. New Mexico's involvement was solicited, New Mexico chose not to participate but was kept apprised of the development of the 2008 Operating

Agreement. The 1979 and 1980 contracts, as between EBID and Reclamation, and between EPCWID and Reclamation respectively, required the contract parties to implement an operating agreement that would not change or impact Rio Grande Compact requirements or accounting methods. For this and other reasons, the 2008 Operating Agreement did not require the approval of the Rio Grande Compact Commission or the Compact States.

#### 6. 2008 Operating Agreement allocation method

In her report at ix, Dr. Barroll's conclusion number 6 states:

*The 2008 OA adopts the D3 Allocation method which was proposed by EBID in 2006 and implemented in 2006. Under the D3 Allocation, EPCWID and Mexico are allocated Project water based on Project performance during the 1951 – 1978 period (the D1 and D2 Curves), and EBID is allocated whatever Project water is left over.*

Opinion: This conclusion is factually incorrect. EBID in April 26, 2006 proposed to Reclamation the use of a modified D2 curve labeled "D3" for allocating Rio Grande Project Water. The 2008 Operating Agreement incorporated a modified version of part of EBID's April 26, 2006 proposal. The allocation method used in the 2008 Operating Agreement was approved by Reclamation, EBID and EPCWID after lengthy negotiations in 2007 and 2008. The 2008 Operating Agreement allocation method works to ensure EPCWID and EBID receive appropriate allocations of Project Water. The 2008 Operating Agreement provides for historic D1/D2 (1951-1978) diversion allocations of Project Water to Mexico and EPCWID, and EBID receives EBID's D2 allocation less reductions in diversion for a given amount of water released from Caballo Reservoir, the largest component of which is groundwater pumping in New Mexico which is capturing Project Water supply.

#### 7. Unused allocation balances at end-of-year

In her report at ix, Dr. Barroll's conclusion number 7 states:

*The 2008 OA also adopts “Carryover” (proposed in 2006 by EPCWID and partially implemented that year), so that unused allocation remaining to a District at the end of one year can be carried over intact to that same District the following year.*

Opinion: The 2008 Operating Agreement allows both EBID and EPCWID to carry over their respective allocation balances from one year to the next year under the defined procedures and limitations set forth in the 2008 Operating Agreement.

#### 8. Change in the allocation of the U.S. share of Project Water

In her report at ix, Dr. Barroll conclusion number 8 states:

*The effect of D3 Allocation, Carryover, and the 2008 OA has been to change the allocation of the U.S. share of Project water so that EPCWID is now allocated an average of 56% (not including Carryover) or 62% (including Carryover). EPCWID’s actual charged diversions (that is, water actually called for, received, and charged to the District) during this period (2008-2018) have averaged 55% of total District charged diversions.*

Opinion: The 2008 Operating Agreement has not resulted in increased allocations to EPCWID above what EPCWID is entitled to from the Rio Grande Project. Any change in the allocation of Project Water between EBID and EPCWID first occurred and became progressively worse when New Mexico farmers and other water users drilled wells near the Rio Grande and increased consumption of Rio Grande Project Water by capturing river and irrigation return flow. The 2008 Operating Agreement provides an appropriate method to allocate Project Water to EBID and EPCWID at a ratio to each District’s respective amount of Project-Authorized Acreage and based on the 1951-1978 conditions, a time-period when significant amounts of Project Water were captured by groundwater pumping in Rincon and Mesilla valleys.

#### 9. D3 allocation method reduced full supply allocations to EBID

In her report at x, Dr. Barroll’s conclusion number 9 states:

*The D3 Allocation as initiated in 2006, has reduced EBID’s full-supply allocation and the amount of water Reclamation has delivered to EBID in full-supply years by approximately one-third (1/3). EBID’s full-supply allocation has dropped from 495,000*

*AF to less than 330,000 AF. Implementation of D3 Allocation in 2006 caused EBID's diversion in full-supply years to decrease from an average of 464,000 AF (in 1996-2002) to an average of 312,000 AF (2007-2009).*

Opinion: There has been no reduction in water allocation to EBID farmers under the 2008 Operating Agreement. EBID's farmers are allocated and receive 57% or more of the Rio Grande Project Water supply when the amount of Rio Grande Project Water captured by groundwater pumping in New Mexico is included in allocation and delivery calculations. New Mexico farmers have received and continue to receive a 4.5 AF per acre combined allocation of surface and groundwater every year.

10. Allocation increased to level not historically contemplated

In her report at x, Dr. Barroll's conclusion number 10 states:

*By contrast, the D3 Allocation and Carryover under the 2008 OA has actually increased EPCWID's full-supply allocation of water to levels not historically contemplated. EPCWID's current-year allocation (that is EPCWID's allocation apart from Carryover) in full-supply years has increased from 377,000 AF to an average of 391,500 AF. EPCWID's total allocation (including) has exceeded 500,000 AF in some years.*

Opinion: EPCWID's full-supply annual allocation has not increased above what was historically contemplated. The increase in the full-supply 376,840 to 394,526 AF was a result of a compromise made by EPCWID in the context of the 2008 Operating Agreement at the request of EBID to provide for more groundwater recharge in New Mexico during years of full supply (the maximum annual release from Caballo Reservoir was increased from Reclamation's proposed 763,840 to 790,000 AF). The amount of Project Water that Reclamation can allocate in any year to EPCWID is limited by the 2008 Operating Agreement to 394,526 AF. EPCWID's allocation balance varies from month-to-month depending on the amount of water charged against the balance (debits) and the amount of water allocated by Reclamation (credits). The allocation procedures in the 2008 Operating Agreement are a reasoned attempt to return EPCWID's share



of the Project Water supply to the amounts based upon the 1951-1978 conditions represented by the D2 curve.

#### 11. Unused and unneeded allocations

In her report at x, Dr. Barroll's conclusion number 11 states:

*EPCWID Charged Diversions (that is, water actually called for, received, and charged to the District) in full-supply years under the 2008 OA have averaged less than 300,000 AF, leaving large amounts of unused, unneeded allocation which is "placed" in its Carryover account. One of the reasons EPCWID's Charged Diversions are as low as they are is because current Project accounting does not charge EPCWID for their diversion and use of municipal treated effluent generated in the El Paso Valley by the City of El Paso.*

Opinion: Dr. Barroll's conclusion is factually incorrect and misunderstands fundamental water management principles. All of EPCWID's allocations are used and needed. One of the primary purposes of a water supply reservoir is to store inflows for use at a later time. During wet periods water is often stored for one or more years ("carried over" in storage from year to year). During extraordinary droughts the amount of water in storage in the reservoir at the end of the primary irrigation season will often be minimal. Both Districts have allocation balances that as of the 2008 Operating Agreement are no longer zeroed out at the end of a calendar year. It is appropriate that EPCWID is not charged for municipal effluent in the El Paso Valley because the effluent is not discharged to the Rio Grande and is not Project Water.

#### 12. Change in Project accounting of diversions

In her report at x, Dr. Barroll's conclusion number 12 states:

*The D3 Allocation as initiated in 2006, and then set forth in the 2008 OA, reduces EBID's allocation to account for all negative departures from historical (1951 – 1978) Project performance. This allocation method is based on the assumption that all of the negative departures from historical performance are caused by New Mexico. However, a significant part of that negative departure in Project performance is caused by changes in Project accounting that have occurred since the 1951 – 1978 historical period. In addition, part of the negative departure in Project performance is caused by the effects of depletions and groundwater pumping in Texas and Mexico.*

Opinion: The purpose of the 2008 Operating Agreement was to re-establish deliveries to Texas that were disrupted by New Mexico's extensive development of wells. Those wells capture Project Water and allow increased demand and consumption of Project Water in New Mexico resulting in increased frequency of water shortages in both Texas and New Mexico. The 2008 Operating Agreement does not assume that all of the "negative departures from historical performance are caused by New Mexico." The 2008 Operating Agreement contains multiple compromises negotiated among EBID, EPCWID, and Reclamation to assure EPCWID would receive and could divert from the Rio Grande similar annual quantities of Project Water as EPCWID received based on the 1951 through 1978 time period; and that EBID would receive similar quantities for the same time period when taking into consideration both surface water allocations and capture of Project Water through groundwater pumping.

The evidence that the 2008 Operating Agreement is working as intended is that both the amount of Project Water released from Caballo Reservoir and the amount of Project Water flowing in the Rio Grande into Texas (Rio Grande at El Paso) are nearly identical for ten years between 1951 through 1960 and the first ten years of the 2008 Operating Agreement (2008 through 2017). Both time periods include years of extreme drought.

13. EPCWID is allocated significantly greater water than the district orders

In her report at x, Dr. Barroll's conclusion number 13 states:

*Since the advent of D3 Allocation and the 2008 OA, in many years EPCWID has been allocated amounts of water significantly greater than the amounts that District orders and diverts.*

Opinion: EPCWID manages its use of allocated Project Water to meet the needs of its water users which includes the conservation of water for future use. EPCWID actively conserves water in years with full allocations for use in drought years, and uses all of its allocated water in

the time and manner it deems most beneficial to the District and its water users. The corollary to Dr. Barroll's conclusion is that EPCWID and EBID must drain the reservoir every year so that no water is ever carried-over into the next year. There has been "carryover" of Rio Grande Project water since the first-year water was stored in Elephant Butte Reservoir in 1916. Storage and carry-over of water from year-to-year is an appropriate and prudent operation of a water supply reservoir.

14. Cause and effect of groundwater pumping New Mexico

In her report at x, Dr. Barroll's conclusion number 14 states:

*The 2008 OA has reduced EBID's share of Project supply during full-supply years below the amount needed to supply EBID's lands. As a result, EBID farmers have increased groundwater pumping.*

Opinion: This conclusion is factually and legally incorrect. Excessive groundwater pumping in New Mexico which captures Project Water commenced decades prior to the 2008 Operating Agreement. New Mexico's diversions of Project Water through pumping of hydrologically connected groundwater resulted in decreased surface deliveries to both EBID and EPCWID regarding the water supply the Districts are entitled to from the Rio Grande Project. The 2008 Operating Agreement attempts to protect EPCWID's Project allocation delivery from capture by New Mexico pumpers. Pumping in New Mexico, not the 2008 Operating Agreement has reduced EBID's Project surface water supply. The 2008 Operating Agreement is a contract among Reclamation, EBID, and EPCWID, and both as a factual and legal matter there is nothing in the Agreement that requires or causes any increase or decrease of groundwater pumping in EBID or elsewhere in New Mexico.

15. Reduced recharge in Rincon and Mesilla valleys

In her report at x, Dr. Barroll's conclusion number 15 states:

*The reduction in EBID's share of Project water has reduced the amount of recharge to the aquifer in the Rincon and Mesilla Valleys through canal seepage.*

Opinion: Although it is true that a reduced diversion of surface water from Project supply would reduce canal seepage, the primary cause of reduced recharge to the aquifers in Mesilla and Rincon valleys since 2008 has been the prolonged and extraordinary drought that has greatly reduced the amount of water available for allocation. The reduction in recharge caused by drought was exacerbated by the large amount of Project Water captured by groundwater pumping in New Mexico permitted by the New Mexico Office of the State Engineer. New Mexico farmers are permitted a combined groundwater/surface water allocation of 4.5 AF per acre per year for farmers. New Mexico municipal, industrial, and domestic water users rely 100% on groundwater with no required offsets of water to the Rio Grande Project.

16. Groundwater budget has been negatively impacted

In her report at xi, Dr. Barroll conclusion number 16 states:

*Between the increase in groundwater pumping and the decrease in recharge, the groundwater budget of the Rincon and Mesilla aquifer system has been negatively impacted by more than 100,000 AF/Y in full-supply years. Historically, shallow groundwater levels in the Rincon and Mesilla Valleys responded to surface water supply variation; groundwater levels dropped during times of low supply, and recovered in full supply years. Following implementation of D3 Allocation, shallow groundwater levels have dropped during low supply years, but have not recovered in the full supply years that follow.*

Opinion: Groundwater pumping in New Mexico and the associated capture of Project Water has significantly and adversely impacted surface water supplies in Texas and New Mexico.

Groundwater levels in New Mexico have not recovered because the amount of Project Water consumed in New Mexico (by capture of Project Water through groundwater pumping) has been increasing since 1938. New Mexico groundwater pumpers are responsible for New Mexico's

groundwater mining not the 2008 Operating Agreement's protection of EPCWID's Project allocation.

17. EPCWID does not use all the water it is allocated in some years

In her report at xi, Dr. Barroll's conclusion number 17 states:

*The Project enjoyed full-supply conditions from 1979 through 2002, and EPCWID was allocated a full supply in each year. EPCWID diverted less than it was allocated in all but two of these years. Available Reclamation records do not suggest that EPCWID ordered water that it did not receive. Therefore, I conclude that EPCWID needed less water than it was allocated during this period.*

Opinion: This conclusion that "EPCWID needed less water than it was allocated" is factually incorrect and ignores sound water management principles. In many years EPCWID and/or EBID decide to conserve water allocated in a wet year to address future needs or anticipated shortages (drought years). It is a well-accepted and prudent practice to conserve water during times of adequate supply for use in times of drought.

18. ACE Allocation Credit

In her report at xi, Dr. Barroll's conclusion number 18 states:

*Starting in the year 2003, EPCWID has received an allocation credit for the American Canal Extension ("ACE"). The ACE credit increases EPCWID allocation by up to approximately 20,000 AF. Under the allocation method in the 2008 OA, this same amount (up to ~20,000 AF) is subtracted from EBID's allocation, reducing EBID's total allocation and the amount EBID can order.*

Opinion: EPCWID does not receive any greater benefit for the American Canal Extension under the 2008 Operating Agreement than prior to the Agreement; and in some years, EPCWID receives no use of the credit and in other years the credit accrues to the benefit of EBID. The ACE canal credit is less than the reduction in seepage losses in the Rio Grande resulting from the construction of concrete lined ACE canal. These seepage losses existed since 1938 until the ACE canal was completed in 1996. The ACE canal credit does not reduce the annual diversion

allocation to EBID. It does allow an appropriate credit to EPCWID for water conservation associated with EPCWID's payment of the local cost-share for constructing the ACE canal, and for the cost to operate and maintain the ACE canal.

19. EPCWID makes more use of carryover than EBID

In her report at xi, Dr. Barroll's conclusion number 19 states:

*Because of the decrease in EBID's allocation under D3 Allocation, and because EPCWID is now allocated more water than it diverts in full-supply (or near full-supply) years, EPCWID makes much more use of Carryover than EBID. EPCWID has had a large Carryover account in several years.*

Opinion: The premise of Dr. Barroll's conclusion incorrectly links EBID's allocation under the 2008 Operating Agreement to the amount of water EPCWID conserves from one calendar year to the next, and fails to acknowledge sound water management practices. Under the 2008 Operating Agreement, during periods of less than full allocations, EPCWID is allocated the same amount of water the District was allocated based on the 1951 through 1978 time period. Any decrease in EBID's surface water allocation as a result of the 2008 Operating Agreement is in proportion to the amount of Project Water captured in New Mexico as a result of groundwater pumping. The amount of Project Water left in each District allocation account at the end of each year is a water management decision based on conservation and drought management practices implemented by each District. A majority of the farmers within EBID are fortunate to have access to highly productive irrigation wells that produce good quality water. Farmers in the El Paso Valley have less productive wells that produce poor quality water that harms their crops, soils and yields.

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No. 141, Original

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In the  
SUPREME COURT OF THE UNITED STATES

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STATE OF TEXAS,

Plaintiff,  
v.

STATE OF NEW MEXICO and  
STATE OF COLORADO,

Defendants

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OFFICE OF THE SPECIAL MASTER

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CERTIFICATE OF SERVICE

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This is to certify that on the 30th day of December, 2019, the **UNITED STATES OF AMERICA'S DISCLOSURE OF REBUTTAL EXPERT DR. AL BLAIR** was served via electronic mail and/or U.S. mail as indicated, upon the individuals listed on the Service List, attached hereto.

Respectfully submitted,

*/s/Amber Engelkes* \_\_\_\_\_

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**No. 141, Original**

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**In the  
SUPREME COURT OF THE UNITED STATES**

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**STATE OF TEXAS,**

**Plaintiff,  
v.**

**STATE OF NEW MEXICO and  
STATE OF COLORADO,**

**Defendants**

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**OFFICE OF THE SPECIAL MASTER**

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**UNITED STATES OF AMERICA'S DISCLOSURE OF EXPERT  
REBUTTAL WITNESS DR. IAN M. FERGUSON**

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Pursuant to Fed. R. Civ. P. 26(a)(2)(C) and (D), and the Case Management Plan executed by the Hon. Michael J. Melloy, Special Master, on September 6, 2018, and amendments thereto, Plaintiff United States of America hereby designates Dr. Ian M. Ferguson Ph.D., P.E., as a rebuttal expert, as follows:

I. Dr. Ferguson's qualifications are summarized in the United States' Supplemental Disclosure of Expert Witness Ian M. Ferguson, served September 16, 2019, and are incorporated herein by reference. As with his designation as a non-retained expert, Dr. Ferguson's ordinary work duties do not include providing expert testimony, including in rebuttal. For his work on this matter, including rebuttal opinions summarized herein, Dr. Ferguson has received no compensation in addition to the salary he receives as a federal employee.

II. Subject Matter

Under Fed. R. Civ. P. 26(a)(2)(C)(i), Dr. Ferguson will provide rebuttal testimony to the opinions of (1) Dr. Margaret "Peggy" Barroll set forth in her expert report dated October 31, 2019 and submitted in No. 141, Original; (2) Estevan Lopez, P.E., as set forth in his expert report of October 31, 2019; (3) Gregory K. Sullivan, P.E. and Heidi M. Welsh, in their expert report dated October 31, 2019 and submitted in No. 141, Original; and (4) John C. Carron and Steven T. Setzer, in their expert report dated October 28, 2019 and submitted in No. 141, Original.

III. Summary of Dr. Ferguson's Rebuttal Opinions to the Report of Dr. Margaret Barroll

Dr. Ferguson has reviewed the Dr. Barroll's expert report and will offer rebuttal opinions to the opinions contained in Dr. Barroll's report. A summary of Dr. Ferguson's rebuttal opinions follows:

A. Impacts of Groundwater Pumping in Texas.

Opinion: With regard to Dr. Barroll’s assertion that groundwater pumping in the Texas portion of the Mesilla Valley and in the El Paso Valley have reduced Rio Grande Project (“Project”) supplies, Dr. Barroll overlooks that the primary difference between pumping in New Mexico and pumping in the Texas portion of the Mesilla Valley is the magnitude of pumping. Estimates of groundwater pumping provided in the expert report of Sullivan and Welsh indicate that more than 80% of the total groundwater pumping in the Rincon and Mesilla Valleys occurs in New Mexico and less than 20% occurs in Texas; similar estimates are provided in the expert report of Hutchinson. While the relative amount of annual pumping in each state varies from year to year, these studies indicates that the relative amount of cumulative pumping has remained consistent since the late 1960s. Model simulation results presented in the expert report of Sullivan and Welsh and the expert report of Hutchinson further suggest that the depletion of Project surface water supplies is roughly proportional to the cumulative amount of pumping, with approximately 80% of the total depletion of Project supplies in the Rincon and Mesilla Valleys resulting from groundwater pumping in New Mexico and approximately 20% resulting from groundwater pumping in Texas.

With respect to groundwater pumping in the El Paso Valley (Hueco Bolson aquifer), model simulation results presented in the expert report of Sullivan and Welsh indicate that the effects of groundwater pumping in the El Paso Valley on historical Project diversions and deliveries to Elephant Butte Irrigation District (“EBID”) are negligible. Groundwater pumping in El Paso Valley no longer impacts Project deliveries in El Paso Valley due to the construction of the American Canal Extension (“ACE”), which eliminates the effects of groundwater/surface-water interactions on Project deliveries in the El Paso Valley.

B. Reduction in Annual Diversion Allocation to EBID under the “D3 Method”.



Opinion: With respect to Dr. Barroll’s opinions regarding the reduction in annual diversion allocation to EBID under the “D3 Method” in the 2008 Operating Agreement (“OA”), Dr. Barroll incorrectly suggests that the adjustment to EBID’s annual diversion allocation under the “D3 Method” is strictly negative. *See* Barroll Rep., opinions 6, 12, and 19. The “D3 Method” allocation procedure increases EBID’s annual diversion allocation compared to the “D1/D2 Method” in years when actual current-year Project delivery performance exceeds historical delivery performance as represented by the D2 Curve.

Dr. Barroll also incorrectly suggests that the “D3 Method” is based on the assumption that any negative departure from historical Project performance is caused by New Mexico. *See* Barroll Rep. opinion 12 & § 6.3.1. The “D3 Method”—including both the Diversion Ratio adjustment to EBID’s annual diversion allocation and carryover accounting for unused allocation balance—is part of a negotiated settlement between EBID, El Paso County Water Improvement District No. 1 (“EPCWID”), and Reclamation, and not on explicit assumptions regarding the cause of “negative departures from historical Project performance.” *Id.* Dr. Ferguson’s rebuttal opinions are based in part on the facts that (1) the D2 Curve incorporates effects of groundwater pumping on Project water supplies during the period 1951-1978, including the impacts of significant groundwater pumping in New Mexico during these years; (2) the majority of groundwater pumping in the Rincon and Mesilla Valleys occurs in New Mexico; and (3) groundwater pumping in the Rincon and Mesilla Valleys affects Project water supplies under current Project operations, while groundwater pumping in the El Paso Valley does not impact current Project operations.

C. Causes of Increased Groundwater Pumping in New Mexico.

Opinion: Dr. Barroll incorrectly attributes recent increases in groundwater pumping for supplemental irrigation within EBID to a reduction in annual diversion allocations to EBID under the OA. Dr. Barroll's attribution of increases in groundwater pumping to the OA fails to recognize that increased groundwater pumping in New Mexico and corresponding impacts on the Project occurred prior to the OA. Estimates of groundwater pumping in the Rincon Valley and the New Mexico portion of the Mesilla Valley provided in the expert report of Sullivan and Welsh show that groundwater pumping in New Mexico increased from 1985 to 2002, despite full diversion allocations to EBID through this period. Pumping in New Mexico continued to increase from 2003 to 2005, prior to the implementation of the "D3 Method" allocation procedure. Similar estimates are provided in the report of Hutchinson.

Increases in groundwater pumping in New Mexico occurred prior to the OA due to increases in water demands for supplemental irrigation within EBID, increases in water demands for irrigation of groundwater-only lands outside of EBID, and increases in water demands for domestic, municipal, industrial, and commercial uses. Current demands within EBID exceed the historical full-supply delivery of 3.024 AF per acre.

Increased groundwater pumping to meet these demands, and the corresponding impacts on Project surface-water supplies, was a major driver in negotiation of the OA. The reduction in EBID's annual diversion allocation under the "D3 Method" was negotiated as a means to offset these impacts. Under the "D3 Method," EBID foregoes a portion of its annual diversion allocation to offset the impacts of groundwater pumping in New Mexico on Project allocations and deliveries to EPCWID.

D. Rebuttal to Specific Opinions by Dr. Barroll.

Dr. Ferguson expects to offer the following opinions in response to the opinions or “conclusions” listed in Dr. Barroll’s Report at pp. ix-xi (set forth in italics below).

*Barroll Opinion 1: The Rio Grande Project 2008 Operating Agreement has greatly reduced the surface water supply to New Mexico farmers, to the detriment of New Mexico. Texas, however, has benefitted by the 2008 Operating Agreement through an increase in the allocation of water to its irrigation district, and because that district can now carry over large amounts of unused allocation from one year to the next.*

Opinion: Dr. Barroll’s opinion fails to acknowledge that groundwater pumping in New Mexico and corresponding impacts on the Project occurred prior to 2008, when the OA was agreed to, and that the “D3 Method” was negotiated as a means to offset those impacts. This failure to recognize the impacts of groundwater pumping in New Mexico on the Project also appears in Barroll Opinions 6, 8, 9, and 14. Dr. Barroll also incorrectly states that the OA results in increased annual diversion allocations to EPCWID. The annual allocation to EPCWID may be greater under the “D3 Method” than under the “D1/D2 Method” only in years when the Usable Water available for current-year allocation is between 763,842 acre-feet and 790,000 acre-feet. In all other years, the annual allocation to EPCWID under the “D3 Method” is the same or less than under the “D1/D2 Method.” During multi-year droughts, the annual allocation to EPCWID is less under the “D3 Method” due to the Drought Correction Factor in the OA.

*Barroll Opinion 3: A 1938 Contract between the Districts sets forth a division of Project water supply between the Districts in accordance with the proportions of Project acreage: 88,000 of 155,000 Project acres (57%) to EBID, and 67,000 of 155,000 Project acres (43%) to EPCWID. From 1938 through 1978, Reclamation operated the Project so that EBID farmers were entitled to 57% of the U.S. share of Project Supply and EPCWID farmers were entitled to 43% of the U.S. share of Project Supply.*

Opinion: Dr. Ferguson has reviewed the 1938 Contract and Project delivery records prior to 1978, and concludes that Dr. Barroll’s statement that the 1938 Contract “sets forth a division of Project water supply between the Districts in accordance with the proportions of Project acreage” is incorrect. The 1938 Contract specifically states “in the event of a shortage of water for

irrigation in any year, the distribution of the available supply in such a year, shall so far as practicable, be made in the proportion of 67/155 thereof to the lands within the El Paso County Water improvement District No. 1, and 88/155ths to the lands within the Elephant Butte Irrigation District.” Under the 1938 contract, the division of Project water supply between EBID and EPCWID based on acreage is explicitly limited to years in which there is a “shortage of water for irrigation” – it does not apply to all years.

Dr. Barroll’s statement that “from 1938 through 1978, Reclamation operated the Project so that EBID farmers were entitled to 57% of the US share of Project supply” is also incorrect. From 1938 through 1950, Reclamation operated the Project without allotments – *i.e.*, farmers were able to call for water as needed, with no allotment or limit imposed. From 1951-1978, Reclamation allotted water equally to all Project acres. However, Reclamation did not guarantee equal delivery to all lands; rather, actual deliveries to farms depended on the amount of water called for by farmers. Farm delivery data provided in the expert report of Sullivan and Welsh demonstrate that the proportion of annual farm deliveries from 1938-1978 delivered to EBID ranged from 49-60 percent.

*Barroll Opinion 4: Starting in 1979, Reclamation explicitly allocated Project Supply to the Districts in the ratio of 57% to EBID and 43% to EPCWID. The total amounts allocated were defined using the D1/D2 Curves. The amounts of water diverted by the Districts and delivered to their farmers were consistent with this 57:43 ratio.*

Opinion: The amounts of water diverted by the Districts and delivered to their farmers depended on the amounts of water called for by the districts and farmers, respectively. River diversion data provided in the expert report of Sullivan and Welsh demonstrate that the percentage of annual diversions to EBID from 1979 to 2007 ranged from 52 to 59 percent of the total annual diversion to the Districts and annual farm deliveries to EBID during this period ranged from 32 to 62 percent of the total annual farm delivery by the Districts. Table A.8 of Appendix A of Dr.

Barroll's report also shows that farm deliveries in any given year deviated from the 57:43 ratio, sometimes considerably.

*Barroll Opinion 8: The effect of D3 Allocation, Carryover, and the 2008 OA has been to change the allocation of the U.S. share of Project water so that EPCWID is now allocated an average of 56% (not including Carryover) or 62% (including Carryover). EPCWID's actual charged diversions (that is, water actually called for, received, and charged to the District) during this period (2008-2018) have averaged 55% of total District charged diversions.*

Opinion: Dr. Barroll not only overlooks the impacts of groundwater pumping in New Mexico and corresponding impacts on the Project prior to the adoption of the OA, but that the percentages of Project allocations to EBID and EPCWID provided in her report do not agree with percentages computed from Reclamation's allocation records reviewed by Dr. Ferguson.

*Barroll Opinion 9: The D3 Allocation as initiated in 2006, has reduced EBID's full-supply allocation and the amount of water Reclamation has delivered to EBID in full-supply years by approximately one-third (1/3). EBID's full-supply allocation has dropped from 495,000 AF to less than 330,000 AF. Implementation of D3 Allocation in 2006 caused EBID's diversion in full-supply years to decrease from an average of 464,000 AF (in 1996-2002) to an average of 312,000 AF (2007-2009).*

*Barroll Opinion 10: By contrast, the D3 Allocation and Carryover under the 2008 OA has actually increased EPCWID's full-supply allocation of water to levels not historically contemplated. EPCWID's current-year allocation (that is EPCWID's allocation apart from Carryover) in full-supply years has increased from 377,000 AF to an average of 391,500 AF. EPCWID's total allocation (including Carryover) has exceeded 500,000 AF in some years.*

Opinion: Dr. Barroll's definition of "full-supply years" is not consistent with the definition used by Reclamation, EBID, and EPCWID, which typically defines "full supply" conditions based on the amount of Usable Water in Project Storage available for the current-year allocation. Prior to the OA, full supply was defined by Usable Water available for the current-year allocation equal to or greater than 763,800 acre-feet; under the OA, full supply conditions are defined by Usable Water available for the current-year allocation equal to or greater than 790,000 acre-feet.

In addition, Dr. Barroll's opinion ignores the impacts of groundwater pumping in New Mexico on the Project. Groundwater pumping in New Mexico, and the corresponding impacts on Project surface-water supplies, was a major driver in negotiation of the OA. The reduction in EBID's annual diversion allocation under the "D3 Method" was negotiated as a means to offset these impacts. Under the "D3 Method," EBID foregoes a portion of its annual diversion allocation to offset the impacts of groundwater pumping in New Mexico on Project allocations and deliveries to EPCWID.

Further, while the annual allocation to EPCWID in full-supply years may be slightly greater under the "D3 Method," the annual allocation in other years (less than full-supply years) is less than or equal to the annual allocation to EPCWID under the "D1/D2 Method." In particular, the annual allocation to EPCWID under the "D3 Method" is less under severe drought conditions due to the Drought Correction Factor applied under the OA.

*Barroll Opinion 11: EPCWID Charged Diversions (that is, water actually called for, received, and charged to the District) in full-supply years under the 2008 OA have averaged less than 300,000 AF, leaving large amounts of unused, unneeded allocation which is "placed" in its Carryover account. One of the reasons EPCWID's Charged Diversions are as low as they are is because current Project accounting does not charge EPCWID for their diversion and use of municipal treated effluent generated in the El Paso Valley by the City of El Paso.*

Opinion: First, Dr. Barroll incorrectly suggests that EPCWID should receive an allocation charged for diversion and use of municipal effluent generated in the El Paso Valley by the City of El Paso. EPCWID is charged for diversion and use of all water that meets the definition of "Project Water" as defined in Section 1.6 of the OA. Municipal treated effluent generated in the El Paso Valley does not meet the definition of Project Water.

Second, Dr. Barroll incorrectly characterizes carryover accrued by EPCWID as "unused" and "unneeded." EPCWID implements water conservation measures to allow the district to

accrue carryover when possible (e.g., in years when the district's diversion allocation is average or above average). The district then relies on carryover to meet water demands during years when its annual diversion allocation is below average, such as in 2011. Additionally, allocation charges to EPCWID in 2013 exceeded the district's total allocation, resulting in a negative carryover balance in 2014. Project accounting records thus show that EPCWID has utilized its carryover.

*Barroll Opinion 12: The D3 Allocation as initiated in 2006, and then set forth in the 2008 OA, reduces EBID's allocation to account for all negative departures from historical (1951 – 1978) Project performance. This allocation method is based on the assumption that all of the negative departures from historical performance are caused by New Mexico. However, a significant part of that negative departure in Project performance is caused by changes in Project accounting that have occurred since the 1951 – 1978 historical period. In addition, part of the negative departure in Project performance is caused by the effects of depletions and groundwater pumping in Texas and Mexico.*

Opinion: Contrary to Dr. Barroll's opinion, the adjustment to EBID's annual diversion allocation is not strictly negative under the OA. Rather, EBID's annual diversion allocation under the OA increases in years when actual current-year Project delivery performance exceeds historical delivery performance. Moreover, the "D3 Method" is not based on a negative departure from historical performance that is then imputed to New Mexico, as Dr. Barroll suggests in Opinion 12. Rather, the "D3 Method" – including both the Diversion Ratio adjustment to EBID's annual diversion allocation and carryover accounting for unused allocation balance – is part of a negotiated settlement among EBID, EPCWID, and Reclamation, and is not based on explicit assumptions regarding the cause of "negative departures from historical Project performance."

Regarding changes in Project accounting procedures have also evolved throughout the history of the Project in responses to changes in Project infrastructure, operations, operation and maintenance responsibilities, and other factors that affect Project operations.

Regarding effects of depletions and groundwater pumping in Texas on Project performance, the D2 Curve incorporates effects of groundwater pumping in New Mexico and Texas on Project water supplies during the period 1951-1978. Data presented in the expert report of Sullivan and Welsh indicate that estimated annual groundwater pumping in the Texas portion of the Mesilla Valley under the OA has been within 10% of estimated average annual groundwater pumping during the period 1951-1978. Similar data are presented in the expert report of Hutchison. Effects of depletions and groundwater pumping in the Texas portion of the Mesilla Valley are thus reflected in the D2 Curve. Model simulation results presented in the expert report of Sullivan and Welsh indicate that the effects of groundwater pumping in El Paso Valley, including pumping in Texas and Mexico, on historical Project deliveries is negligible. Lastly, model simulation results presented in the expert report of Barth indicate that groundwater pumping in the Conejos-Médanos Basin—*i.e.*, the Mexican portion of the Mesilla Valley aquifer—has not depleted Project surface water supplies. These results demonstrate that depletions and groundwater pumping in Texas and Mexico do not appreciably contribute to “negative departures in Project performance.”

*Barroll Opinion 14: The 2008 OA has reduced EBID’s share of Project supply during full-supply years below the amount needed to supply EBID’s lands. As a result, EBID farmers have increased groundwater pumping.*

Opinion: Dr. Barroll’s opinion overlooks that groundwater pumping in New Mexico and corresponding impacts on the Project occurred prior to the OA, and that the “D3 Method” in the OA was negotiated to offset these impacts. In addition, Dr. Barroll fails to acknowledge that the



historical full-supply farm delivery of 3.024 AF/acre is itself “below the amount needed to supply EBID’s lands” due to increases in crop water demands within EBID (as used here, the term crop water demand refers to farm delivery requirement (“FDR”), consumptive irrigation requirement (“CIR”), or both. Increases in crop water demand have occurred due to the widespread transition to higher water use crops—e.g., transition from cotton to pecans. As a result, supplemental groundwater pumping is required to meet EBID’s crop water demands even if a historical full-supply delivery is achieved. Supplemental groundwater pumping within EBID occurred even in full-supply years prior to 2006; as acknowledged in Section 9.2 of Dr. Barroll’s report and shown in Figure 5-3 of the expert report of Dr. Gill Barth, groundwater pumping for irrigation (including supplemental irrigation within EBID and irrigation of groundwater-only lands outside of EBID) averaged approximately 60,000 AF per year between 1980-2002 and exceeded 100,000 AF in 2006.

*Barroll Opinion 17: The Project enjoyed full-supply conditions from 1979 through 2002, and EPCWID was allocated a full supply in each year. EPCWID diverted less than it was allocated in all but two of these years. Available Reclamation records do not suggest that EPCWID ordered water that it did not receive. Therefore, I conclude that EPCWID needed less water than it was allocated during this period.*

Opinion: Although EPCWID received all water that the district ordered during the period 1979-2002, Dr. Barroll is incorrect in assuming that water orders and deliveries can be used to assess whether water demands have been met. Reclamation ensures that diversion allocations do not exceed the amount of water that can be physically delivered to Project diversion points and accounted for under Project water accounting procedures. Allocations are constrained by the available Project supply, including return flows, as accounted for under Project water accounting procedures. Water orders by EBID, EPCWID, and US-IBWC on behalf of Mexico are subsequently constrained by each entity’s allocation. Reclamation will not allocate water that

cannot be delivered, and will not accept a delivery order that cannot be met. Therefore, the fact that all delivery orders were met cannot be interpreted as all demands being met. Finally, Dr. Barroll fails to acknowledge that Project water is allocated based on the available supply and the authorized acreage within each district. Neither the “D1/D2 Method” allocation procedure nor the “D3 Method” allocation procedure considers water demands in determining Project diversion allocations.

*Barroll Opinion 18. Starting in the year 2003, EPCWID has received an allocation credit for the American Canal Extension (“ACE”). The ACE credit increases EPCWID allocation by up to approximately 20,000 AF. Under the allocation method in the 2008 OA, this same amount (up to ~20,000 AF) is subtracted from EBID’s allocation, reducing EBID’s total allocation and the amount EBID can order.*

Opinion: Dr. Barroll’s opinion does not acknowledge that the net allocation charge to EPCWID would be less were water still delivered to Riverside Canal via the Rio Grande instead of via the ACE due to seepage losses from the Rio Grande between American Dam and the former location of Riverside Dam. The ACE Conservation Credit is less than the estimated reduction in seepage losses. As a result, the ACE Conservation Credit does not reduce the annual diversion allocation to EBID; rather, it allows EPCWID to benefit from water conservation achieved by the district’s investment in constructing the ACE. Also, Dr. Barroll does not acknowledge that the ACE Conservation Credit has not been applied in several recent years by agreement between EBID and EPCWID; these years include the extremely dry years of 2011, 2013, and 2016. Finally, Dr. Barroll does not acknowledge that, in the event that EPCWID’s carryover reaches the limit specified in Section 1.11 of the OA, carryover in excess of that specified limit, including carryover resulting from the ACE Conservation Credit, is transferred to EBID’s carryover balance.

*Barroll Opinion 19: Because of the decrease in EBID’s allocation under D3 Allocation, and because EPCWID is now allocated more water than it diverts in full-supply (or near*

*full-supply) years, EPCWID makes much more use of Carryover than EBID. EPCWID has had a large Carryover account in several years.*

Opinion: EPCWID actively manages its allocation to accrue carryover when possible and to utilize carryover during drought periods, as part of the District's approach to improving water supply reliability during severe drought conditions. Dr. Barroll's opinion does not acknowledge that the OA provides EBID the opportunity to accrue and utilize carryover in the same manner as EPCWID. However, EBID chooses not to actively manage its allocation to take advantage of carryover; instead, irrigators within EBID increase their groundwater use to meet crop water demands during drought periods.

*Barroll Opinion 20: EPCWID's Carryover account includes the effects of Project credits, some of which do not represent water left in reservoir storage. Carryover accounts are not reduced to account for evaporation. As a result, some amount of water in EPCWID's Carryover account is not associated with actual "wet" water. The amount of allocation carried over, and the extra water needed to deliver the Carryover, is subtracted from Usable Water before any new allocation is made. Therefore, part of the inflow to Elephant Butte is not available for allocation, but instead is used to support and fulfill EPCWID's Carryover account. This has had a significant negative effect on EBID's allocation.*

Opinion: Dr. Barroll's opinion is based on an incorrect premise: that Project diversion allocations represent water in Project storage. Reclamation allocates and accounts for Project water at the point of delivery. Prior to the transfer of operations and maintenance (O&M) responsibilities to EBID and EPCWID in 1979, Reclamation allocated water to Project lands and delivered and accounted for Project water at farm turnouts. Following the transfer of O&M responsibilities, Reclamation allocates Project water to EBID and EPCWID and delivers and accounts for Project water at each District's respective headings. Project allocations have always been determined based on the amount of Usable Water in Project Storage and the estimated gains and losses between Caballo Dam and Project delivery points (*i.e.*, farm turnouts prior to 1979 and diversion headings after 1979). Allocations have never represented a specific amount of

water in Project storage. Carryover is not reduced to reflect reservoir evaporation losses is because carryover represents a District's unused allocation balance at the end of the prior year. It does not represent a specific amount of "water left in reservoir storage."

IV. Summary of Dr. Ferguson's Rebuttal Opinions in Response to the Report of Estevan Lopez, P.E.

Dr. Ferguson expects to offer opinions in rebuttal to the following opinions of Mr.

Estevan Lopez, P.E.:

*Lopez Opinion 4.5: The Downstream Contracts among Reclamation, Elephant Butte Irrigation District ("EBID"), and El Paso County Water Improvement District Number 1 ("EPCWID") (EBID and EPCWID are collectively referred to as "the Districts"), as well as Reclamation's historic operation of the Project as a single unit are and should remain the bases for establishing and maintaining the water allocation between New Mexico and Texas below Elephant Butte (Section 6). That allocation is based on:*

- 1. Operation of the Project as a single irrigation system;*
- 2. Equal delivery of Project water supply to every acre within the Project each year, whether in New Mexico or Texas, with minimal operational waste of water at the bottom of the Project;*
- 3. Project water supply comprised of releases of Usable Water, inflow below Elephant Butte and return/drain flows; and*
- 4. Conjunctive use of groundwater to meet irrigation demands.*

Opinion: Mr. Lopez incorrectly states that the 1938 Contract requires that Project water

(excluding water delivered to Mexico) "be shared between EBID and EPCWID with the relative proportions as a percent of the total described as ... approximately 57% and 43%, respectively."

Lopez Rep. § 5.3.3. The 1938 Contract specifically states that "in the event of a shortage of water for irrigation in any year, the distribution of the available supply in such a year, shall so far as practicable, be made in the proportion of 67/155 thereof to the lands within the [EPCWID], and 88/155ths to the lands within the [EBID]." Under the 1938 Contract, the division of Project water supply between EBID and EPCWID based on acreage is explicitly limited to years in which there is a "shortage of water for irrigation" – it does not apply to all years.

In addition, Mr. Lopez incorrectly states that “available [Project] supply was to be distributed each year, it was not a multi-year operation.” Lopez Rep. § 5.3.3. Elephant Butte Reservoir was planned and designed to provide multi-year carryover storage. The reservoir has always been operated such that reservoir storage is increased during years of high inflow and depleted during years of low inflow. Carryover accounting—*i.e.*, allowing EBID and EPCWID to “carry over” their respective unused allocation balances from one year to the next—was initiated in 2006 and was formalized in 2008 by the Operating Agreement. While not a part of historical operations prior to 2006, no existing contract prohibits implementation of carryover accounting.

Lastly, Mr. Lopez’s interpretation of the 1938 Contract and allocation and delivery of Project Water on an equal acre-foot per acre basis fails to acknowledge that groundwater pumping in New Mexico captures Project water by increasing seepage losses from the Rio Grande, decreasing seepage gains to the Rio Grande, and decreasing drainage return flows within the Project. Capture of Project water by groundwater pumping must be considered in evaluating the distribution of Project water between EBID and EPCWID. The “D3 Method” allocation procedure implemented under the OA was developed as a means to offset the impacts of groundwater pumping in New Mexico on Project allocations and deliveries to EPCWID and Mexico.

*Lopez Opinion 4.6: The 2008 Operating Agreement is inconsistent with the Compact because it effectively changed the water apportionment to New Mexico’s detriment without the involvement or approval of either New Mexico or Colorado (Section 7.1). It did so in three ways:*

- 1. The 2008 Operating Agreement inappropriately charges EBID for delivery inefficiencies caused by Texas and Mexico.*
- 2. The 2008 Operating Agreement created carryover storage accounts for the Districts, changing the amount of Project water available for allocation.*
- 3. The 2008 Operating Agreement continues a practice that started in 2003, of giving EPCWID an inappropriate American Canal Extension allocation credit. This credit*

*could increase EPCWID's allocation by up to 20,000 acre-feet per year and reduces EBID's allocation by the same amount.*

Opinion: Regarding Mr. Lopez's opinion that the OA "effectively changed the water apportionment to New Mexico's detriment," groundwater pumping within the Project depletes Project surface water supplies to the benefit of pumpers and detriment of non-pumpers. Groundwater pumping in New Mexico and the corresponding depletion of Project surface water supplies effectively changed the water apportionment to New Mexico's benefit. The reduction in EBID's annual diversion allocation under the "D3 Method" allocation procedure was negotiated as a means to offset these impacts. Under the "D3 Method," EBID foregoes a portion of its annual diversion allocation to offset the impacts of groundwater pumping in New Mexico on Project allocations and deliveries to EPCWID.

Regarding "inappropriate charges to EBID for delivery inefficiencies caused by Texas and Mexico," Mr. Lopez is also incorrect that the Operating Agreement "charges EBID for delivery inefficiencies caused by Texas and Mexico." First, The "D3 Method"—including both the Diversion Ratio adjustment to EBID's annual diversion allocation and carryover accounting for unused allocation balance—is part of a negotiated settlement between EBID, EPCWID, and Reclamation. The "D3 Method" is not based on explicit assumptions regarding the cause of "inefficiencies" within the Project. Second, data and model simulation results provided by other New Mexico experts indicates that groundwater pumping in Texas and Mexico do not appreciably contribute to "delivery inefficiencies" relative to historical conditions as represented by the D2 Curve. The D2 Curve incorporates effects of groundwater pumping in New Mexico and Texas on Project water supplies during the period 1951-1978. Data presented in the expert report of Sullivan and Welsh indicate that estimated annual groundwater pumping in the Texas portion of the Mesilla Valley under the OA has been within 10% of estimated average annual

groundwater pumping during the period 1951-1978. Similar data are presented in the expert report of Hutchison. Effects of depletions and groundwater pumping in the Texas portion of the Mesilla Valley are thus reflected in the D2 Curve. Model simulation results presented in the expert report of Sullivan and Welsh indicate that the effects of groundwater pumping in El Paso Valley, including pumping in Texas and Mexico, on historical Project deliveries are negligible. Similarly, model simulation results presented in the expert report of Barth indicate that groundwater pumping in the Conejos-Médanos Basin—*i.e.*, the Mexican portion of the Mesilla Valley aquifer—has not depleted Project surface water supplies. These results demonstrate that depletions and groundwater pumping in Texas and Mexico do not appreciably contribute to “delivery inefficiencies” relative to historical conditions.

Regarding carryover accounting under the Operating Agreement, carryover accounting does not change the amount of Usable Water available for allocation. Rather it ensures that Usable Water is allocated only once, rather than requiring that any unused allocation at the end of a given year be eliminated and the corresponding water in storage effectively re-allocated the following year.

Regarding Mr. Lopez’s opinion on the ACE credit, see Dr. Ferguson’s response to Dr. Barroll’s opinion 18.

*Lopez Opinion 4.8: In addition to the 2008 Operating Agreement, certain other Texas and United States actions have harmed New Mexico (Section 7.3-7.5).*

- 1. Since the early 1980s, Reclamation and EPCWID have failed to minimize operational waste, resulting in excess water being delivered to Hudspeth County Conservation and Reclamation District Number 1 (“HCCRD”).*
- 2. Treated City of El Paso wastewater effluent is delivered to EPCWID canals but not counted as Project supply for EPCWID. Some or all of this effluent is then inappropriately sold to HCCRD.*
- 3. The purpose of use for some Project supply has been changed from irrigation to municipal and industrial without consideration of timing, location and amount of return flows.*

Opinion: Regarding Mr. Lopez's opinion that "Reclamation and EPCWID have failed to minimize operational waste," Mr. Lopez's opinion fails to understand Project diversion operations in El Paso Valley; fails to recognize the relationship between hydrologic conditions on Project operations, including operational waste; and appears to rely on faulty estimates of operational waste for the period 2003-2017. Project diversion dams and canal headings in El Paso Valley are operated to divert all available streamflow except what is required for delivery to Mexico under the 1906 Convention. As a result, diversions to EPCWID in El Paso Valley often include water in excess of EPCWID's corresponding water orders, such as storm runoff, water ordered by EBID but not diverted, and greater than anticipated bypass or return flows from Rincon and Mesilla Valleys. EPCWID attempts to use all water diverted in El Paso Valley, including water in excess of EPCWID's water orders. Water diverted in excess of EPCWID's water orders and that cannot be put to use within EPCWID contributes to operational waste. EPCWID receives an allocation charge for all water diverted in El Paso Valley; in the event that EPCWID is unable to use water diverted in excess of its water order, EPCWID may receive an allocation credit. Operational waste from EPCWID in El Paso Valley thus reflects hydrologic conditions and upstream operations.

Increased operational waste from EPCWID in El Paso Valley from 1979-2002 was primarily the result of extremely wet hydrologic conditions throughout this period. As shown in the expert report of Sullivan and Welsh, operational waste from El Paso Valley was generally greater than 15% of total diversions from 1938-1950, generally less than 10% from 1951-1978, and generally greater than 15% from 1979-2002. Fluctuation in operational waste are consistent with fluctuations in hydrologic conditions: the period 1938-1950 was dominated by extremely wet hydrologic conditions; the period from 1951-1978 was dominated by dry and normal



conditions; and the period from 1979-2002 was again dominated by extremely wet conditions. Operational waste increased during wet hydrologic conditions due to increases in storm runoff and greater than anticipated bypass and return flows from the Rincon and Mesilla Valleys. In addition, operational waste during the 1980s and 1990s included large amounts of water ordered by EBID but not diverted. Increased operational waste during this period did not result from negligence or improper operations by EPCWID or Reclamation.

Mr. Lopez's claims that operational waste has remained excessively high since 2003 appears to be based on estimates of operational waste presented in Figure 5-22, Figure 5-23, and Figure 5-24 of the expert report of Sullivan and Welsh. These estimates are based on correlation analysis over the period 1951-2002. These estimates are flawed because they do not account for the significantly different hydrologic conditions between the periods 1951-1978 and 1979-2002. Lack of accounting for the relationship between hydrologic conditions and operational waste results in significant over-estimation of operational waste after 2002.

Regarding Mr. Lopez's opinion that treated effluent from the City of El Paso is delivered to EPCWID and not counted as Project supply, Mr. Lopez incorrectly implies that EPCWID should receive an allocation charged for diversion and use of municipal effluent generated in the El Paso Valley by the City of El Paso. EPCWID is charged for diversion and use of all water that meets the definition of "Project Water" as defined in Section 1.6 of the OA. Municipal treated effluent generated in the El Paso Valley does not meet the definition of Project Water.

Regarding Mr. Lopez's opinion that the purpose of use for some Project supply has been changed without consideration of timing, location, or amount of return flows, drainage return flows from EPCWID lands in El Paso Valley are generally not available for delivery within the Project. In addition, use of drainage return flows from EPCWID lands in El Paso Valley is

limited due to its relatively high salinity content. Changes in timing, location, or amount of return flows from water converted to municipal and industrial uses therefore has negligible impact on Project deliveries to EPCWID.

V. Summary of Dr. Ferguson’s Rebuttal Opinions to the Report of Gregory K. Sullivan, P.E., and Heidi M. Welsh

Dr. Ferguson expects to offer the following opinions in rebuttal to the following opinions of Gregory K. Sullivan, P.E., and Heidi M. Welsh:

*Welsh Opinion 5: Despite extensive efforts over several years to obtain all available flow records in the Lower Rio Grande basin, there remained missing data that needed to be estimated for technical analysis and modeling purposes. Over a relevant time period, correlations were derived from two sets of available data. The missing data were estimated using the correlation equation and available data. The estimates of these missing data in the SWDataSet are reasonable and suitable for use in modeling and analysis.*

Opinion: Sullivan’s and Welsh’s use of correlation or regression analysis to fill missing data does not account for the effects of hydrologic conditions on Project operations. For example, operational waste from EPCWID in El Paso Valley was estimated based on correlations over the period 1951-2002. The early part of this period (1951-1978) is characterized by normal to extremely dry hydrologic conditions; the latter part of this period (1979-2002) is characterized by extremely wet hydrologic conditions. These conditions affect Project operations, including operational waste. Use of correlations based in part on extremely wet conditions (1979-2002) to estimate operational waste during recent years characterized by normal to extremely dry hydrologic conditions (2003-2018) results in a significant over estimation of recent operational waste.

*Sullivan Opinion 13: Average annual farm headgate deliveries (“FHG deliveries”) of Project water were relatively steady from the 1950s - 1970s, increased during the 1980s and 1990s, and have declined since then due to the recent drought. (Figure 5-10, Figure 5-12, Figure 5-14).*

Opinion: This conclusion is incorrect or misleading. As shown in Figures 5-10, 5-12, and 5-14, FHG deliveries of Project water were not “relatively steady from the 1950s-1970s.” Rather, FHG deliveries during this period varied from less than 0.5 acre-feet per acre to more than 2.5 acre-feet per acre (Figures 5-12 and 5-14). In addition, it should be clarified that FHG deliveries declined in the early 2000s relative to the wet period during the 1980s and 1990s, not relative to the 1950s-1970s. Recent FHG deliveries since 2003 are comparable to FHG deliveries during the 1950s-1970s; FHG deliveries during both of these periods reflect severe drought conditions.

*Sullivan Opinion 14: The total applied water in EBID, including deliveries of Project water and supplemental pumping, has declined slightly since the 1980s. Conversely, the total applied water in EPCWID, including deliveries to EPW, has remained steady through time. (Figure 5-15 and Figure 5-19).*

Opinion: Figures 5-15 and 5-19 do not support this conclusion. Figure 5-15 indicates that the total applied water in EBID during the period 2008-2016 is slightly greater than the total applied water during the period 1984-1993. Figure 5-19 indicates that the total applied water in EPCWID, including deliveries to EPW, declined slightly during the 1980s, increased during the 1990s, and has generally declined since 2003.

*Sullivan Opinion 15: Project operational waste in EBID typically comprised roughly 10% of canal heading diversions from the 1940s and 1950s and thereafter declined to less than 10% in most years. Operational waste in EPCWID followed a similar pattern in the early years with the waste exceeding 10% in the 1940s, and then declining to roughly 10% or less during the 1950s - 1970s. However, when EPCWID took over water distribution within the district in 1980, operational waste increased substantially to an average of approximately 25% of canal diversions until the recent drought. The increased EPWID waste has resulted in a substantial increase in flows to HCCRD. The excess waste in EPCWID has impacted Project water allocations and deliveries to EBID. (Figure 5-20 through Figure 5-23).*

Opinion: Operational waste in during the period 1979-2002 is greater than during the period 1951-1978 due to extremely wet hydrologic conditions during this period. Operational waste during this period includes large amounts of water diverted in excess of district water orders,

including storm runoff, greater than anticipated bypass and return flows from the Rincon and Mesilla Valleys, and water ordered by EBID and not diverted. Operational waste during this period is consistent with operational waste during the 1940s, which were also characterized by extremely wet hydrologic conditions.

In addition, as noted above, the correlation analysis used to estimate operational waste for the period 2003-2016 incorrectly over-estimates operational waste. Lack of accounting for hydrologic conditions in estimating recent operational waste contributes to the incorrect conclusion that operational waste from 2003-2016 is excessive compared to operational waste from 1951-1978.

*Sullivan Opinion 16: The NMOSE has required all well users in the LRG basin within New Mexico to measure and report ground water pumping since 2009. During the relatively dry decade that the measuring requirement has been in effect (2009-2018), annual LRG irrigation pumping in New Mexico has averaged 219,000 AF. New Mexico pumping during this period has been affected by the reduction in Project water allocations to EBID as a result of the 2008 OA. Unlike in New Mexico, there reportedly are no requirements in Texas or Mexico to measure and report pumping, and no records of LRG irrigation pumping are available for those areas. (Figure 5-25).*

Opinion: This conclusion incorrectly implies or assumes that metering of pumping results in reduction of pumping, or that lack of metering of pumping results in an increase in pumping. The fact that groundwater pumping in New Mexico is metered has no bearing on the fact that groundwater pumping in New Mexico depletes Project water supplies. In addition, this conclusion incorrectly implies that recent increases in groundwater pumping in New Mexico are the result of reduced allocations to EBID under the OA; to the contrary, increased groundwater pumping in New Mexico and corresponding impacts on Project water supplies began decades before the Operating Agreement was adopted. Lastly, this conclusion fails to acknowledge that increased groundwater pumping in New Mexico, and the corresponding impacts on Project surface-water supplies, was a major driver in negotiation of the OA and that the reduction in

EBID's annual diversion allocation under the "D3 Method" was negotiated as a means to offset these impacts.

*Sullivan Opinion 17: Non-irrigation pumping, primarily for municipal uses, has increased substantially throughout the LRG Area, most notably in the El Paso and Juarez areas. Annual non-irrigation pumping in New Mexico increased to an average of approximately 38,000 AF during the last ten years. This is much less than the non-irrigation pumping that has averaged approximately 82,000 AF in Texas and 144,000 AF in Mexico during the last ten years. (Figure 5-26 through Figure 5-28).*

Opinion: This conclusion incorrectly implies that the impact of groundwater pumping on the Project is proportionate to the volume of pumping, without consideration as to the location where pumping occurs. Modeling results provided with the expert report of Sullivan and Welsh demonstrate that groundwater pumping in New Mexico results in significant depletion of Project deliveries to EBID and EPCWID. These modeling results also demonstrate that groundwater pumping in the Texas portion of the Mesilla Valley results in much smaller depletions of Project deliveries to EBID and EPCWID (less than 25% of the depletion caused by pumping in New Mexico). In addition, these modeling results demonstrate that groundwater pumping in the Conejos-Médanos Basin (*i.e.*, the Mexican portion of the Mesilla Valley aquifer) and in the Hueco Bolson have negligible impact on Project deliveries to EBID and EPCWID.

VI. Summary of Dr. Ferguson's Rebuttal Opinions to the Report of John C. Carron and Steven T. Setzer

Dr. Ferguson expects to offer the following opinions in rebuttal to the following opinions of John C. Carron and Steven T. Setzer:

*Carron Opinion 7: The RiverWare Model simulates the Rio Grande Project's current and past operating policies (i.e., the D1/D2 historical operating policy and the D# rules from the 2008 Operating Agreement). Through evaluation of the modeled system conditions, the model can evaluate and process logical "what-if" operating scenarios that reflect the real-world policies of Project operations, accounting rules and other operational guidelines. In this way, the logical constructs of Project operations policies and District operations are included in the model, and changes to those operations and resultant impacts to water supply can be evaluated.*

*Setzer Opinion 9: The RiverWare Model simulates Rio Grande Project operations and accounting under both the historical D1/D2 operations, as described by Reclamation in the Rio Grand Project Water Supply Allocation Procedures, and the more recent consolidated D1/D2 and D3 operations described in the 2008 Operating Agreement (including updates and variations reflected in the latest Project Allocation spreadsheets provided Reclamation's El Paso Area Office).*

Opinion: The RiverWare Model described in the expert report of Carron and Setzer incorrectly represents at least two basic elements of Rio Grande Project operations. First, the RiverWare Model does not represent the transfer of excess carryover between districts. Section 1.11 of the Operating Agreement states that “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.” The RiverWare Model correctly limits each district's carryover to its respective carryover limit specified in Section 1.10 of the OA; however, the RiverWare Model incorrectly fails to transfer any excess carryover by either district to the carryover account of the other district.

Second, the RiverWare Model incorrectly allocates water between EBID and EPCWID during the period 1955-1980. From 1951-1978, Reclamation allotted the amount of Project water available for delivery to Project lands each year pro rata—*i.e.*, each acre of Project land under irrigation in a given year received the same allotment. Beginning in 1979, Reclamation has allocated the amount of Project water available for diversion each year in proportion to each district's authorized acreage—*i.e.*, 88/155ths (approximately 57%) to EBID and 67/155ths (approximately 43%) to EPCWID. The RiverWare Model incorrectly allocates water to EBID and EPWCID based on a 60:40 ratio during the period 1955-1980. Allocation of Project water based on a 60:40 ratio—*i.e.*, 60% to EBID and 40% to EPCWID—is incorrect and does not reflect historical Project operations.

The RiverWare Model's failure to correctly represent basic elements of Project operations may result in biases or errors in simulating historical conditions and alternative scenarios.

*Carron Opinion 8: I have reviewed the development and use of the Integrated LRG Model, including, in particular, the processes related to model coupling, iteration, and convergence, and find that it is well suited for evaluating scenarios in the study area.*

*Setzer Opinion 6: The three models converge with each other. For any given scenario (set of model simulations with the Integrated LRG Model) convergence is considered achieved when the total farm headgate deliveries, which are representative of all components that vary from one iteration to the next, differ by 0.1% or less between the last two iterations of the Integrated LRG Model.*

*Setzer Opinion 7: Where the models overlap in representing physical processes, they are consistent with each other.*

Opinion: The RiverWare and MODFLOW components of the "Integrated LRG Model" ("ILRGM") are inconsistent in at least two ways. First, the RiverWare and MODFLOW components exhibit large mass balance discrepancies on monthly and annual timescales. Tables 3-4 of the expert report by Carron and Setzer purport to show that mass balance discrepancies between the RiverWare and MODFLOW components of the ILRGM are small. However, values presented in Tables 3-4 are annual averages over the full 78-year simulation period. Analysis of monthly and annual differences reveals that mass balance discrepancies between components of the ILRGM are in fact substantial. For example, Table 3 shows the difference in simulated streamflow at the Rio Grande at El Paso stream gage location (labeled "Surface Water Out" in Table 3) between the RiverWare Model and the New Mexico Rincon-Mesilla ("NMR-M") MODFLOW model is just 384 acre-feet. By contrast, annual differences range -43,688 acre-feet to +38,356 acre-feet, with a mean absolute error of 6,760 acre-feet and a root mean square error of 10,944 acre-feet. Analysis of monthly and annual differences between the

RiverWare and MODFLOW components of the ILRGM demonstrates that overlapping physical processes exhibit large mass balance errors.

Second, the distribution of Project deliveries from the Eastside and Westside Canals between EBID and EPCWID is different between the RiverWare Model and the NMR-M MODFLOW model. The Eastside and Westside Canal divert water at Mesilla Dam in New Mexico and deliver water to Project lands in New Mexico (EBID) and Texas (EPCWID). The RiverWare model simulates Project deliveries to the EBID and EPCWID portions of the Eastside and Westside Canal systems based on crop water demands and available allocations. By contrast, the MODFLOW model simulates Project deliveries within the Eastside and Westside Canal service areas “based on percentages reflecting the acreage served by each canal or lateral” (*see* expert report of Barth, Section 5.5.1 and Technical Appendix K). The RiverWare Model is thus capable of simulating different deliveries (per acre) to lands in EBID and EPCWID from the Eastside and Westside Canal systems, whereas the NMR-M MODFLOW model simulates deliveries in proportion to acreage, irrespective of differences in crop water demands and available allocations.

Inconsistencies and lack of convergence between the RiverWare and MODFLOW components of the ILRGM may result in biases or errors in simulating historical conditions and alternative scenarios.

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Respectfully submitted this 30th day of December, 2019.

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No. 141, Original

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In the  
SUPREME COURT OF THE UNITED STATES

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STATE OF TEXAS,

Plaintiff,  
v.

STATE OF NEW MEXICO and  
STATE OF COLORADO,

Defendants

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OFFICE OF THE SPECIAL MASTER

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CERTIFICATE OF SERVICE

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This is to certify that on the 30th day of December, 2019, the **UNITED STATES OF AMERICA'S DISCLOSURE OF EXPERT REBUTTAL WITNESS IAN M. FERGUSON** was served via electronic mail and/or U.S. mail as indicated, upon the individuals listed on the Service List, attached hereto.

Respectfully submitted,

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**No. 141, Original**

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**In the  
SUPREME COURT OF THE UNITED STATES**

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**STATE OF TEXAS,**

**Plaintiff,  
v.**

**STATE OF NEW MEXICO and  
STATE OF COLORADO,**

**Defendants**

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**OFFICE OF THE SPECIAL MASTER**

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**UNITED STATES OF AMERICA’S DISCLOSURE OF EXPERT  
REBUTTAL WITNESS DR. J. PHILLIP KING**

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Pursuant to Fed. R. Civ. P. 26(a)(2)(C) and (D), and the Case Management Plan executed by the Hon. Michael J. Melloy, Special Master, on September 6, 2018, and amendments thereto, Plaintiff United States of America hereby designates Dr. J. Phillip King as a rebuttal expert witness.

I. Qualifications.

Dr. King is a Professor and Associate Department Head in the Department of Civil Engineering at New Mexico State University, specializing in Agricultural and Water Resources Engineering. He has been on the faculty at NMSU since January of 1990. He has also served as a consultant to Elephant Butte Irrigation District (EBID) since the early 1990s.

Dr. King has a Bachelors degree in Civil Engineering from the University of California, Berkeley, a Masters and Ph.D. in Agricultural Engineering from Colorado State University, and a Masters of Business Administration from NMSU. He is a licensed Professional Engineer in New Mexico.

In his thirty years in New Mexico, he has participated in and contributed to many aspects of water management on the Rio Grande downstream of Elephant Butte Dam. He consulted for EBID during the quiet title suit in the late 1990s and early 2000s and was directly involved in the development and implementation of the 2008 Operating Agreement (“OA”), and he has served as EBID’s representative on the OA Allocation Committee that administers the OA. He also worked with New Mexico Office of the State Engineer (“NMOSE”) and Interstate Stream Commission in their study of the water management and hydrology of the Lower Rio Grande (“LRG”) Basin. He has discussed the OA many times with NMOSE and ISC personnel. The opinions Dr. King presents below are based on his education and training and on his three decades of experience in the LRG as a researcher, teacher, and consultant. For his rebuttal testimony in this matter Dr. King is receiving no compensation other than the compensation he receives in his capacity as a consultant for EBID.

A. Subject Matter

Under Fed. R. Civ. P. 26(a)(2)(C) and (D), Dr. King will provide testimony in rebuttal to the report of Dr. Margaret (“Peggy”) Barroll, dated October 31, 2019 and served by the State of New Mexico in No. 141, Original Action.

B. Summary of Facts

Dr. King has reviewed Dr. Barroll’s report. In reviewing the reports provided by various experts for New Mexico, Dr. King sees many elements that he has directly dealt with extensively, and a brief summary explanation will help to clarify his responses to specific conclusions.

1. Key Definitions:

Release: The volume or flow rate of water flowing through the control gates at Caballo Dam.

Diversion: The volume or flow rate of water received by EBID, EPCWID, and Mexico. Terms for charging diversions to allocation accounts are described in the OA.

Delivery: The volume or flow rate of water received by and charged to end users in EBID, EPCWID, and at the International Dam to Mexico.

Allocation: The volume of water that is available for charged diversion to each of EBID, EPCWID, and Mexico as described in the OA.

Allotment: The volume of water that is available for delivery to end users in EBID and EPCWID, and for Mexico. The district determine their own allotments.

Carryover: The volume of water allocated to each district that is not charged for diversion in a given year, and remains in each district’s allocation the subsequent year.

2. Summary of Facts in Support of Rebuttal Opinions:

The OA came out of years of discussion among EBID, El Paso County Water Improvement District No. 1 (“EPCWID”), and Reclamation. In developing his rebuttal opinions Dr. King has considered the following facts:

1. Extraction of groundwater that is hydrologically connected to the surface water of the Rio Grande Project (“RGP”) in the Mesilla and Rincon valleys reduces the surface water supply of the RGP. This is true for extraction of hydrologically connected groundwater in New Mexico, Texas, and Mexico. The only question is of timing of impacts on surface water.

2. The interaction between surface water and groundwater in the RGP area has been recognized since the first half of the last century, and the relationship has become clearer through continuing data collection and analysis, and development of hydrologic models. All of the models developed by the parties in the current proceeding reflect this interaction.

3. New Mexican and Texas water users developed a large capacity for hydrologically connected groundwater extraction in the Rincon and Mesilla valleys beginning in the 1940s.

4. Use of groundwater by agricultural, Municipal and Industrial (“M&I”), and other water users has had an effect on the amount of surface water available for diversion in the RGP for a given level of release from storage in Elephant Butte and Caballo reservoirs. Extraction of hydrologically connected groundwater in the Rincon and Mesilla Valleys occurs in both New Mexico and Texas, with the significant majority of that extraction occurring in New Mexico. Extraction of groundwater began in the Mexico portion of the Mesilla Valley in 2009-2010, but its effects on the RGP have not yet occurred due to distance and geologic structure between the river system and the Mexican wellfield.

5. The OA was developed to protect the EPCWID Project allocations from the impacts of groundwater pumping in the New Mexico portion of the RGP by allocating water to EPCWID based on 43 percent of the D2 curve available to the U.S. districts. This established 1951 through 1978 as the baseline for allocation of RGP water to EPCWID.

6. In 2006, EBID proposed allocating water to EPCWID based on 43 percent of the available diversion estimated by D2 for the annual usable release in Project storage less Mexico's allocation. This did not include provisions for carryover, which EBID opposed at the time. Carryover was later agreed to by the OA parties as part of the overall settlement.

7. The target for allocation and delivery to EPCWID of 43 percent of the D2-estimated diversion for the two districts was also the target for delivery in the NMOSE's draft Active Water Resource Management ("AWRM") regulations for the LRG. In those proposed regulations, the NMOSE sought to make deliveries by cutting groundwater withdrawals for irrigated agriculture. The OA makes the allocation and delivery of Project water to EPCWID by offsetting impacts from groundwater pumping with surface water. Having recently gone into the drought of the 2000s, it was critical to EBID farmers to continue to have access to groundwater when the surface water supply would be reduced by drought.

8. Reclamation accepted EBID's proposal for D2-based allocation in 2006. Reclamation also allowed EPCWID to carry over half of its unused allocation from 2006 to 2007, and all of its unused allocation from 2007 to 2008.

9. The 2008 OA was a compromise that came out of a lawsuit filed by EPCWID in 2007. It did not fix the problems with depletion of RGP water by groundwater pumping in New Mexico, nor was it intended to. It was intended to keep EPCWID whole, by providing allocation based on the 1951 through 1978 baseline of D2. The OA attempted, in part, to make an

interstate issue into an intrastate issue within New Mexico. Carryover was included in the OA as part of the settlement.

10. EBID entered into the OA recognizing the need to offset non-RGP groundwater impacts on the RGP. With the EPCWID issue addressed by the OA, the depletions of RGP water by groundwater pumping in New Mexico adversely impact EBID. Much of that groundwater pumping is done by EBID farmers, so the OA can be thought of as an offset for their pumping. Impacts of groundwater pumping by entities in New Mexico other than EBID remain unaddressed.

C. Summary of Opinions

Dr. King will offer the following opinions in rebuttal to the opinions of Dr. Barroll:

1. *The Rio Grande Project 2008 Operating Agreement has greatly reduced the surface water supply to New Mexico farmers, to the detriment of New Mexico. Texas, however, has benefitted by the 2008 Operating Agreement through an increase in the allocation of water to its irrigation district, and because that district can now carry over large amounts of unused allocation from one year to the next.*

Opinion: The reduction in allocation to EBID farmers, who are the only farmers in New Mexico receiving RGP water, is necessary to make the scheduled delivery to EPCWID with the large depletions of surface water by groundwater pumping in New Mexico. The carryover of unused allocation was a compromise made in the 2008 OA after Reclamation imposed carryover accounting in 2006 and 2007. In that settlement, the carryover was limited to 60 percent of a full year's allocation, and any unused allocation in excess of that cap would "spill" into the account of the other district.

4. *Starting in 1979, Reclamation explicitly allocated Project Supply to the Districts in the ratio of 57% to EBID and 43% to EPCWID. The total amounts allocated were defined using the D1/D2 Curves. The amounts of water diverted by the Districts and delivered to their farmers were consistent with this 57:43 ratio.*

Opinion: Dr. Barroll's opinion is incorrect. From 1979 to 2002, allocations were full, and D1 did not figure into it because Mexico was full at 60,000 acre-feet ("AF") as per the 1906 Convention. D1 only comes into play when Mexico's allocation is reduced due to "Extraordinary drought." D2 was only used to determine the maximum allocation for diversion, which was split 57/43 after Mexico's 60,000 AF.

In 2003 to 2005, Reclamation used D1 for Mexico and did not use D2 at all. Mexico got 11.35% of D1 for the available release (unless 60,000 AF, which 2005 was), and the two districts got 57/43 of whatever was left allocated to them. D2 didn't enter into it, except for the maximum in 2005.

2006 and 2007 saw the implementation of D2-based allocation to EPCWID with carryover, and the OA was adopted 2008.

6. *The 2008 OA adopts the D3 Allocation method which was proposed by EBID in 2006 and implemented in 2006. Under the D3 Allocation, EPCWID and Mexico are allocated Project water based on Project performance during the 1951 – 1978 period (the D1 and D2 Curves), and EBID is allocated whatever Project water is left over.*

Opinion: The intended impact of the "D3 Allocation method" is to offset impacts of groundwater pumping in New Mexico on EPCWID. This is the same downstream delivery target as the NMOSE's draft Basin Specific AWRM regulations. Under the D3 Allocation, deliveries to EPCWID and Mexico are consistent with historical conditions. EBID's allocation is the remaining available diversion, the result of hydrologic effects on the diversion ratio. The largest factor in deviations from D2 is increased groundwater withdrawals in New Mexico relative to the 1951-1978 D2 period, consisting of EBID constituent pumping and non-Project pumping. The NMOSE has no effective administrative scheme for offsetting non-Project groundwater impacts on the RGP, so EBID is bearing the total burden.

8. *The effect of D3 Allocation, Carryover, and the 2008 OA has been to change the allocation of the U.S. share of Project water so that EPCWID is now allocated an average of 56% (not including Carryover) or 62% (including Carryover). EPCWID's actual charged diversions (that is, water actually called for, received, and charged to the District) during this period (2008-2018) have averaged 55% of total District charged diversions.*

Opinion: The 2008 OA is intended to maintain to EPCWID an allocation of 43 percent of the two districts' share of diversion as estimated by D2 for the 1951 through 1978 period. Once again, the reason EBID receives less than 57% of the surface water supply is to offset groundwater depletions in New Mexico relative to the 1951-1978 D2 baseline condition.

9. *The D3 Allocation as initiated in 2006, has reduced EBID's full-supply allocation and the amount of water Reclamation has delivered to EBID in full-supply years by approximately one-third (1/3). EBID's full-supply allocation has dropped from 495,000 AF to less than 330,000 AF. Implementation of D3 Allocation in 2006 caused EBID's diversion in full-supply years to decrease from an average of 464,000 AF (in 1996-2002) to an average of 312,000 AF (2007-2009).*

Opinion: It is pumping in New Mexico, including by both EBID and non-EBID pumpers, that reduces EBID's full-supply allocation. EBID's motivation for proposing to allocate EPCWID 43 percent of the D2 estimate of diversion available to the two districts was to offset impacts of groundwater pumping in New Mexico on the delivery of Project water to EPCWID, to keep EPCWID whole, while maintaining access to groundwater for EBID constituents. This is critically important to the survival of irrigated agriculture in EBID in the current, and previous regional droughts. Much of the groundwater pumping that affects the RGP is done by EBID constituents. A significant portion of the pumping impacts originate from non-EBID water users, and they are not offsetting their impacts on the RGP. EBID's allocation, and resulting allotment to its constituents, is therefore reduced by non-EBID groundwater depletions in the LRG, resulting in more groundwater pumping by EBID constituents. This positive feedback effect results in larger deviations from D2 in higher supply years when the diversion

ratio implied by D2 can be as high as 1.2, but due largely to groundwater depletions, the actual may be 0.8 to 1.0.

*10. By contrast, the D3 Allocation and Carryover under the 2008 OA has actually increased EPCWID's full-supply allocation of water to levels not historically contemplated. EPCWID's current-year allocation (that is EPCWID's allocation apart from Carryover) in full-supply years has increased from 377,000 AF to an average of 391,500 AF. EPCWID's total allocation (including Carryover) has exceeded 500,000 AF in some years.*

Opinion: This is because Reclamation estimated that it took about 764,000 AF release to make a full delivery by working through the D1/D2 equations, and the OA allocates up to 790,000 AF, the annual “normal release” from the Compact. The OA extends the D2 from 764,000 to 790,000 AF with a 1:1 line. In the OA's extended D2, water is not over-allocated, it is merely allocated to a normal release of 790,000 AF. The inclusion of carryover in each district's allocation account is not a new allocation. It is simply not zeroing out unused allocations at the end of the year. The combined effect of the extension of the D2 to a release of 790,000 AF and carryover is clearly not an over-allocation to EPCWID because actual use has always been below the historical full allocation, and in multiple years of the first decade of the OA's implementation, EPCWID has run out of allocation.

*12. The D3 Allocation as initiated in 2006, and then set forth in the 2008 OA, reduces EBID's allocation to account for all negative departures from historical (1951 – 1978) Project performance. This allocation method is based on the assumption that all of the negative departures from historical performance are caused by New Mexico. However, a significant part of that negative departure in Project performance is caused by changes in Project accounting that have occurred since the 1951 – 1978 historical period. In addition, part of the negative departure in Project performance is caused by the effects of depletions and groundwater pumping in Texas and Mexico.*

Opinion: Dr. Barroll's opinion incorrectly assumes that all changes in accounting work against EBID. The changes in Project accounting work both ways, for and against EBID. For example, release accounting, where EBID is not diverting and EPCWID is charged for the larger



of the release from Caballo and their actual diversions, works for EBID. The consecutive drought years adjustment factor applied in the 2010s also lowered the baseline from the standard D2 to a reduced value based on actual project behavior in the 1950s. The net impact on EBID's allocation will vary from year to year, but to imply it always works against EBID is misleading.

Part of the deviation from D2 is due to pumping in Texas. EBID has requested that EPCWID offset the full impact of groundwater withdrawals in the Texas portion of the Mesilla Valley to the extent not already covered in the 2008 OA.

It is highly unlikely that groundwater pumping impacts in the Mexico portion of the Mesilla Basin have reached the Rio Grande Project yet. When they do, the loss should be shared by the two districts in the traditional 57/43 proportions, since it is a Project loss, not due to either district's, or state's, actions. If there are impacts from Mexican withdrawals from the Hueco aquifer system, the hydrology should be explained.

*13. Since the advent of D3 Allocation and the 2008 OA, in many years EPCWID has been allocated amounts of water significantly greater than the amounts that District orders and diverts.*

Opinion: In critically short years, EPCWID uses all of its water, including carryover.

*14. The 2008 OA has reduced EBID's share of Project supply during full-supply years below the amount needed to supply EBID's lands. As a result, EBID farmers have increased groundwater pumping.*

Opinion: Dr. Barroll incorrectly blames the OA for the combined effects of pumping in New Mexico and drought conditions on Project water supply. The OA is intended to maintain Project deliveries to EPCWID. The OA's operation to deliver contracted water to EPCWID, in conjunction with prolonged drought and over-appropriation and excessive groundwater depletions in the Lower Rio Grande, have led to high levels of groundwater pumping. Heavy

pumping by EBID constituents, as well as non-EBID irrigators and M&I users in short supply years, leads to large deviations from D2 in subsequent wetter years, as the aquifer is “paid back.”

EBID has expended significant resources to protest and litigate applications for new groundwater withdrawals that would further deplete the water supply of the RGP and therefore EBID’s allocation and allotment. Examples of the more major court cases include EBID’s intervention in the *City of El Paso By and Through Public Service Bd. v. Reynolds*, 597 F.Supp. 694 (D.N.M. 1984) in the early 80s and EBID filing the Stream Adjudication and forcing the New Mexico State Engineer to adjudicate the basin. There is currently no effective administrative scheme for non-Project groundwater users to offset their impact on the RGP and therefore on EBID. To further exacerbate the situation, groundwater withdrawals by non-Project water users in New Mexico have increased dramatically over the past 40 years.

*15. The reduction in EBID’s share of Project water has reduced the amount of recharge to the aquifer in the Rincon and Mesilla Valleys through canal seepage.*

Opinion: The reduced surface water supply due to prolonged drought and keeping EPCWID whole via the OA has reduced the amount of recharge in the two valleys through canal seepage. Particularly in drought-shortened supply conditions, less surface water supply means shorter water seasons, hence less recharge. The decrease in surface water leads to more groundwater use by EBID constituents, and continuing use by non-Project water users without effective offsets. This “double whammy” on the groundwater system – reduced recharge and increased withdrawals – causes a rapid decline in critically short surface water supply years. The worst drought in the RGP’s history is currently making this effect clear.

*16. Between the increase in groundwater pumping and the decrease in recharge, the groundwater budget of the Rincon and Mesilla aquifer system has been negatively impacted by more than 100,000 AF/Y in full-supply years. Historically, shallow groundwater levels in the Rincon and Mesilla Valleys responded to surface water supply variation; groundwater levels dropped during times of low supply, and recovered*

*in full supply years. Following implementation of D3 Allocation, shallow groundwater levels have dropped during low supply years, but have not recovered in the full supply years that follow.*

Opinion: Protecting and maintaining EPCWID’s Project Water Supply consistent with the D2 baseline, together with New Mexico’s failure to administer and control groundwater pumping affects groundwater levels and the surface water supply to EBID. New Mexico is hitting the groundwater harder across all sectors in the current drought in wet and dry years than in the D2 period, providing deeper groundwater plunges in dry years and less recovery in wet years. Offsetting impacts of groundwater pumping on the Project Water Supply to keep EPCWID on the D2 baseline contributes to the groundwater decline. The core of the problem is not keeping EPCWID whole; it is the lack of coherent groundwater management in New Mexico. Groundwater use in the LRG is under the jurisdiction of the NMOSE, but there has been very little effective administration of groundwater use in the basin. This lack of effective groundwater administration has pushed the cost of keeping EPCWID whole onto EBID. The positive feedback effect should be reversible. With reduced depletions of groundwater through effective administration including offsets, the LRG can live within its hydrologic means. This will require real offsets and reduced depletions basin-wide, and an administrative scheme that is hydrologically sound and equitable to all water use sectors.

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Respectfully submitted this 30th day of December, 2019.

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No. 141, Original

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STATE OF TEXAS,

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OFFICE OF THE SPECIAL MASTER

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CERTIFICATE OF SERVICE

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This is to certify that on the 30th day of December, 2019, the **UNITED STATES OF AMERICA'S DISCLOSURE OF EXPERT REBUTTAL WITNESS DR. J. PHILIP KING** was served via electronic mail and/or U.S. mail as indicated, upon the individuals listed on the Service List, attached hereto.

Respectfully submitted,

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**No. 141, Original**

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**In the  
SUPREME COURT OF THE UNITED STATES**

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**STATE OF TEXAS,**

**Plaintiff,  
v.**

**STATE OF NEW MEXICO and  
STATE OF COLORADO,**

**Defendants**

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**OFFICE OF THE SPECIAL MASTER**

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**UNITED STATES OF AMERICA'S DISCLOSURE OF REBUTTAL  
EXPERT WITNESS MICHELLE ESTRADA-LOPEZ**

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Pursuant to Fed. R. Civ. P. 26(a)(2)(C) and (D), and the Case Management Plan executed by the Hon. Michael J. Melloy, Special Master, on September 6, 2018, and amendments thereto, Plaintiff United States of America hereby designates Michelle Estrada-Lopez, as a rebuttal expert, as follows:

I. Michelle Estrada-Lopez is a Civil Engineer (Hydraulic/Hydrologic) employed by the Bureau of Reclamation (“Reclamation”). She has held this position since September 2013. Her duties include representing Reclamation on the 2008 Operating Agreement (“OA”) committee for the Rio Grande Project, which she has done so since 2016. This assignment entails the development of the initial, monthly updates and final allocation and the final accounting of the water charges to Elephant Butte Irrigation District and El Paso County Water Improvement District No. 1 (the Districts). Her previous position with Reclamation was as a Civil Engineer (Hydrologic) in the Water Management Division of the Albuquerque Area Office from June 2009 through September 2013. In both her prior and current positions with Reclamation, she analyzed water data, made operational decisions on the Rio Grande, Rio Chama and Pecos River, tracked San Juan-Chama Project water and Rio Grande water using the Upper Rio Grande Water Accounting Model as required for Rio Grande Compact accounting and developed San-Juan Chama water routing loss rates from Cochiti Dam to Elephant Butte that were adopted by the Rio Grande Compact Commission for Compact accounting.

Ms. Estrada-Lopez graduated from New Mexico State University with a Master of Science in Civil Engineering in 2009 with a concentration in Water Resources and graduated with Highest Honors with a Bachelor of Science in Civil Engineering in 2007 with a concentration in Water Resources with a minor in Applied Mathematics.

II. Subject Matter

Under Fed. R. Civ. P. 26(a)(2)(C) and (D), Ms. Estrada-Lopez will provide testimony in rebuttal to the expert report of Estevan Lopez, dated October 31, 2019 and served by the State of

New Mexico in No. 141, Original Action, regarding the alleged release of credit water in 2011, that is also alleged in New Mexico's Third Counterclaim For Relief against the United States.

### III. Summary of Facts

Ms. Estrada-Lopez's opinions are based on her review of Mr. Lopez's report, the allocation spreadsheets for the Rio Grande Project ("Project") since 2016, which she developed, and the allocation spreadsheets from 2008-2015, which she reviewed. She is also familiar with the process by which Reclamation continuously tracks the amount of water in Elephant Butte and Caballo Reservoirs through the year and monitors the amount of water in the storage accounts in Elephant Butte Reservoir (Rio Grande Project Water, San Juan-Chama Water, New Mexico Credit Water and Colorado Credit Water). Reclamation uses the OA and corresponding Operation Manual procedures for the Project to determine the allocation to the Districts. This allocation process includes determining the amount of storage available for release combined with return flows and other flow into the Rio Grande below Caballo Reservoir and above the delivery points, delivery efficiency, and the previous year's allocation balances. The allocation to the Districts determines the total volume of water available for the Districts to divert and deliver to their customers. Reclamation determines initial allocations to the Districts during the winter using the water in Project Storage. Each month, or as needed, Reclamation updates the allocations to the Districts to account for changes in the Project including in the Reservoirs due to releases, evaporation, and deliveries from New Mexico.

Ms. Estrada-Lopez is familiar with the procedures Reclamation employs to measure Reservoir stage as well as outflow of the Reservoirs as measured at various downstream gaging locations. She is also familiar with how Reclamation calculates the evaporation estimate for the entire storage in the Reservoir and applies that evaporation estimate prorated to all the storage

accounts in the Reservoir. Through its evaporation calculations, Reclamation knows the amount of water physically present in the Reservoir attributable to each account and how much water has physically evaporated from each account. Using the measured storage, measured outflow and Reclamation's standard Reservoir evaporation method, Reclamation calculates the inflow to the Reservoir. The inflow calculation is used to estimate deliveries into Elephant Butte Reservoir by New Mexico. New Mexico's deliveries to Elephant Butte Reservoir are to the Rio Grande Project storage and are made available for release to the Districts through the monthly allocations.

The procedures for calculating Reservoir stage, outflow, inflow, and evaporation are made on a daily basis. This daily accounting is crucial, particularly in drought situations. When the Reservoir storage is very low and the deliveries from New Mexico to the Reservoir are very low there is not enough water to ensure both releases to the Districts from deliveries from New Mexico and storing New Mexico deliveries in Compact Credit accounts when the water has already physically evaporated. Consequently, actual accounting for water physically in the Reservoir is necessary for New Mexico deliveries under Article IV of the Compact to be made available upon delivery to the Project beneficiaries.

In March 2011, Project Storage was 529,070 acre-feet and Compact Credit water was 169,000 acre-feet (165,000 acre-feet in the spreadsheet appears to be an estimate). By July 2011, Reclamation had released 320,573 acre-feet and 255,152 acre-feet remained in Project Storage. Reclamation calculated that there had been about 118,000 acre-feet of deliveries by New Mexico and about 46,000 acre-feet of evaporation at Elephant Butte (about 33,000 acre-feet attributable to Compact Credit accounts and about 7,500 acre-feet attributable to San Juan-Chama accounts).

Since the deliveries and storage levels were so low, Reclamation could not continue to store the Project beneficiaries' water to cover the Credit water that had physically evaporated.

IV. Opinion

In his report, Mr. Lopez asserts that Reclamation "released" New Mexico's Credit Water in 2011 for the benefit of EPCWID:

In his report at 6, Mr. Lopez states: "4.7 The unauthorized release of New Mexico's Credit Water by Reclamation for the benefit of EPCWID in 2011 was contrary to the explicit language of the Compact and was contrary to an express directive of the Compact Commission. That action harmed New Mexico and continues to harm New Mexico today (Section 7.2)."

In his report at 55, Mr. Lopez states: "In total, Reclamation released about 32,500 acre-feet of New Mexico Credit Water from Elephant Butte Reservoir from mid-August through mid-September 2011."

In his report at 56, Mr. Lopez states: "Reclamation's actions in the summer and fall of 2011 amounted to a compelled "relinquishment" of a portion of New Mexico's Credit Water to Texas in violation of the Compact."

Opinion: These opinions are incorrect, because Reclamation did not release credit water from storage in 2011. Instead, Reclamation released only Project water from storage from mid-August through mid-September that had been delivered into the Reservoir by New Mexico earlier in 2011. These deliveries were calculated in the method described above. Reclamation neither allocated nor released 32,500 acre-feet of New Mexico Credit Water from Elephant Butte Reservoir from mid-August through mid-September because by July that water had already physically evaporated.

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Respectfully submitted this 30th day of December, 2019.

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OFFICE OF THE SPECIAL MASTER

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CERTIFICATE OF SERVICE

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This is to certify that on the 30th day of December, 2019, the **UNITED STATES OF AMERICA'S DISCLOSURE OF REBUTTAL EXPERT WITNESS MICHELLE ESTRADA-LOPEZ** was served via electronic mail and/or U.S. mail as indicated, upon the individuals listed on the Service List, attached hereto.

Respectfully submitted,

/s/Amber Engelkes  
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No. 141, Original

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In the  
SUPREME COURT OF THE UNITED STATES

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STATE OF TEXAS,

Plaintiff,  
v.

STATE OF NEW MEXICO and  
STATE OF COLORADO,

Defendants

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OFFICE OF THE SPECIAL MASTER

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UNITED STATES' SUPPLEMENTAL DISCLOSURE OF EXPERT WITNESS  
INFORMATION

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Pursuant to Fed. R. Civ. P. 26(a)(2)(E) and 26(e)(2), and the Case Management Plan executed by the Hon. Michael J. Melloy, Special Master, on September 6, 2018, and amendments thereto, Plaintiff United States of America hereby supplements its December 30, 2019 Disclosure of Expert Rebuttal Witness Michelle Estrada-Lopez, and any supplements thereto.

The United States' Supplemental Disclosure of Expert Witness Information supplements previous information, documents, files, and data disclosed by Ms. Estrada-Lopez. The data and information comprising this Supplemental Disclosure includes documents not previously produced that were relied upon or that may be relied upon by Ms. Estrada-Lopez in forming her opinions in this case.

These documents have been uploaded to the Box.com file-sharing site for transfer to the Veritext Vaults to be shared with the Parties. The United States reserves the right to further supplement its disclosure if and when additional documents are identified.

Respectfully submitted this 6th day of February, 2020,

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CERTIFICATE OF SERVICE

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This is to certify that on the 6th day of February 2020, I caused a true and correct copy of **UNITED STATES' SUPPLEMENTAL DISCLOSURE OF EXPERT WITNESS INFORMATION** to be served via electronic mail and/or U.S. Mail as indicated, upon those individuals listed on the Service List, attached hereto.

Respectfully submitted,

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**UNITED STATES' SUPPLEMENTAL DISCLOSURE OF EXPERT WITNESS  
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Pursuant to Fed. R. Civ. P. 26(a)(2)(E) and 26(e)(2), and the Case Management Plan executed by the Hon. Michael J. Melloy, Special Master, on September 6, 2018, and amendments thereto, Plaintiff United States of America hereby supplements its May 31, 2019 Disclosure of Expert Witnesses, its December 30, 2019 Disclosure of Expert Rebuttal Witness Dr. Ian M. Ferguson, and any supplements thereto.

The United States' Supplemental Disclosure of Expert Witness Information supplements previous information, documents, files, and data disclosed by Dr. Ferguson. The data and information comprising this Supplemental Disclosure includes documents that were relied upon or may be relied upon by Dr. Ferguson for purposes of his expert testimony in this case that have not previously been produced in this matter. These documents have been uploaded to the Box.com file-sharing site for transfer to the Veritext Vaults to be shared with the Parties.

In addition, Dr. Ferguson relied on or may rely on the following previously produced documents:

Document	Bates Number
Report re: Rio Grande Joint Investigation in Upper Rio Grande Basin (1938)	TX00000561-TX 00001138
Rio Grande Project Water Supply Allocation Procedures	US0167011-US0167024
Review of Historical and Current Allocation Procedures (1981)	US0187454-US0187455
Memo re: 1906 Treaty Deliveries to Mexico (June 29, 1956)	US0171656-US0171660
Memo re: Relationship between Water Salvaged by ACE and EPCWID Allocations (Oct 29, 2000)	US0166371-US0166373
Memo re: Conservation Credit for Salvage of Water by the American Canal Extension (July 7, 2003)	US0168529-US0168532
Slide presentation re: AWRM in Lower Rio Grande-John D'Antonio (August 19, 2005)	US0062993-US0063013
Slide presentation re: AWRM in Lower Rio Grande-Peggy Barroll (August 19, 2005)	US0062965-US0062992



Rio Grande Project Histories 1940-1962 and 1964-1988	US0015044-US0022780 US0191695-US019715 US0192083-US0192189 US0192435-US0192463 US0192536-US0192557 US0192716-US0192812 US0192892-US0192915 US0193032-US0193054 US0193127-US0193221 US0023766- US0023858 US0193383-US0193494 US0193762-US0193817 US0193838-US0193951 US0193956-US0194059 US0194060-US0194168 US0194172-US0194267 US0194441-US0194467 US0024679- US0024797 US0194843-US0194997 US0195076-US0195228
Rio Grande Project Historical Flow Data	US0039758-US0057194

The United States reserves the right to further supplement its disclosure if and when additional documents are identified.

Respectfully submitted this 6th day of February, 2020,

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**No. 141, Original**

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**In the  
SUPREME COURT OF THE UNITED STATES**

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**STATE OF TEXAS,**

**Plaintiff,  
v.**

**STATE OF NEW MEXICO and  
STATE OF COLORADO,**

**Defendants**

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**OFFICE OF THE SPECIAL MASTER**

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**UNITED STATES' SECOND SUPPLEMENTAL DISCLOSURE OF EXPERT WITNESS  
INFORMATION**

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Pursuant to Fed. R. Civ. P. 26(a)(2)(E) and 26(e)(2), and the Case Management Plan executed by the Hon. Michael J. Melloy, Special Master, on September 6, 2018, and amendments thereto, Plaintiff United States of America hereby supplements its May 31, 2019 Disclosure of Expert Witnesses, its December 30, 2019 Disclosure of Expert Rebuttal Witness Dr. Ian M. Ferguson, its February 6, 2020 Supplemental Disclosure of Expert Witness Information and any supplements thereto.

The United States' Second Supplemental Disclosure of Expert Witness Information supplements previous information, documents, files, and data disclosed by Dr. Ferguson. The data and information comprising this Supplemental Disclosure includes documents not already produced that were relied upon or may be relied upon by Dr. Ferguson for purposes of his expert testimony in this case that have not previously been produced in this matter. These documents have been uploaded to the Box.com file-sharing site for transfer to the Veritext Vaults to be shared with the Parties. In addition, these documents were provided to the State of New Mexico in electronic form at the deposition of Dr. Ferguson.

The United States reserves the right to further supplement its disclosure if and when additional documents are identified.

Respectfully submitted this 21st day of February, 2020,

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CERTIFICATE OF SERVICE

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This is to certify that on the 21st day of February 2020, I caused a true and correct copy of **UNITED STATES' SECOND SUPPLEMENTAL DISCLOSURE OF EXPERT WITNESS INFORMATION** to be served via electronic mail and/or U.S. Mail as indicated, upon those individuals listed on the Service List, attached hereto.

Respectfully submitted,

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UNITED STATES' FIRST SUPPLEMENTAL DISCLOSURE OF EXPERT WITNESS  
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Pursuant to Fed. R. Civ. P. 26(a)(2)(E) and 26(e)(2), and the Case Management Plan executed by the Hon. Michael J. Melloy, Special Master, on September 6, 2018, and amendments thereto, Plaintiff United States of America hereby supplements its May 31, 2019 Disclosure of Expert Witnesses, its December 30, 2019 Disclosure of Expert Rebuttal Witness Dr. Al Blair.

The United States' First Supplemental Disclosure of Expert Rebuttal Witness Information supplements previous information, documents, files, and data disclosed by Dr. Al Blair. The information comprising this Supplemental Disclosure includes documents not already produced that were relied upon or may be relied upon by Dr. Blair for purposes of his expert testimony in this case. These documents have been uploaded to the Box.com file-sharing site for transfer to the Veritext Vaults to be shared with the Parties.

The United States reserves the right to further supplement its disclosure if and when additional documents are identified.

Respectfully submitted this 18th day of March, 2020,

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No. 141, Original

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In the  
SUPREME COURT OF THE UNITED STATES

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STATE OF TEXAS,

Plaintiff,

v.

STATE OF NEW MEXICO and  
STATE OF COLORADO,

Defendants

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OFFICE OF THE SPECIAL MASTER

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CERTIFICATE OF SERVICE

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This is to certify that on the 18th day of March 2020, I caused a true and correct copy of **UNITED STATES' FIRST SUPPLEMENTAL DISCLOSURE OF EXPERT WITNESS INFORMATION** to be served via electronic mail and/or U.S. Mail as indicated, upon those individuals listed on the Service List, attached hereto.

Respectfully submitted,

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**No. 141, Original**

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**In the  
SUPREME COURT OF THE UNITED STATES**

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**STATE OF TEXAS,**

**Plaintiff,  
v.**

**STATE OF NEW MEXICO and  
STATE OF COLORADO,**

**Defendants**

---

**OFFICE OF THE SPECIAL MASTER**

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**UNITED STATES' THIRD SUPPLEMENTAL DISCLOSURE OF EXPERT WITNESS  
INFORMATION TO DR. IAN M. FERGUSON**

---

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Pursuant to Fed. R. Civ. P. 26(a)(2)(E) and 26(e)(2), and the Case Management Plan executed by the Hon. Michael J. Melloy, Special Master, on September 6, 2018, and amendments thereto, Plaintiff United States of America hereby supplements its May 31, 2019 Disclosure of Expert Witnesses, its December 30, 2019 Disclosure of Expert Rebuttal Witness Dr. Ian M. Ferguson, its February 6, 2020 Supplemental Disclosure of Expert Witness Information, its February 21, 2020 Second Supplemental Disclosure of Expert Witness Information and any supplements thereto.

The United States' Third Supplemental Disclosure of Expert Witness Information supplements previous information, documents, files, and data disclosed by Dr. Ferguson. The data and information comprising this Supplemental Disclosure includes EIS model source code and build directories not already produced that were relied upon by Dr. Ferguson for purposes of his expert testimony in this case and requested during his deposition held on February 19 and 20, 2020. This data has been uploaded to the Box.com file-sharing site for transfer to the Veritext Vaults to be shared with the Parties.

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Respectfully submitted this 19th day of March, 2020,

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This is to certify that on the 19th day of March 2020, I caused a true and correct copy of **UNITED STATES' THIRD SUPPLEMENTAL DISCLOSURE OF EXPERT WITNESS INFORMATION TO DR. IAN M. FERGUSON** to be served via electronic mail and/or U.S. Mail as indicated, upon those individuals listed on the Service List, attached hereto.

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**No. 141, Original**

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**In the  
SUPREME COURT OF THE UNITED STATES**

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**STATE OF TEXAS,**

**Plaintiff,**

**v.**

**STATE OF NEW MEXICO and  
STATE OF COLORADO,**

**Defendants**

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**OFFICE OF THE SPECIAL MASTER**

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**UNITED STATES' FIRST SUPPLEMENTAL DISCLOSURE  
OF EXPERT REBUTTAL WITNESS DR. J. PHILLIP KING**

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Pursuant to Fed. R. Civ. P. 26(a)(2)(E) and 26(e)(2), and the Case Management Plan executed by the Hon. Michael J. Melloy, Special Master, on September 6, 2018, and amendments thereto, Plaintiff United States of America hereby supplements its December 30, 2019 Disclosure of Expert Rebuttal Witness Dr. J. Phillip King, and any supplements thereto.

The United States' First Supplemental Disclosure of Expert Witness Information supplements previous information, documents, files, and data disclosed by Dr. King. The data and information comprising this Supplemental Disclosure includes documents not already produced that were relied upon or may be relied upon by Dr. King for purposes of his expert testimony in this case that have not previously been produced in this matter. These documents have been uploaded to the Box.com file-sharing site for transfer to the Veritext Vaults to be shared with the Parties.

The United States reserves the right to further supplement its disclosure if and when additional documents are identified.

Respectfully submitted this 28th day of April, 2020,

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STATE OF COLORADO,

Defendants

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OFFICE OF THE SPECIAL MASTER

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CERTIFICATE OF SERVICE

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This is to certify that on the 28th day of April 2020, I caused a true and correct copy of **UNITED STATES' FIRST SUPPLEMENTAL DISCLOSURE OF EXPERT REBUTAL WITNESS DR. J. PHILLIP KING** to be served via electronic mail and/or U.S. Mail as indicated, upon those individuals listed on the Service List, attached hereto.

Respectfully submitted,

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