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## TECHNICAL MEMORANDUM

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SUBJECT:           **Green River Basin Plan**  
                          ***Summary of Interstate Compacts***

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### **Introduction**

The Green River of Wyoming is the major tributary to the Colorado River, one of the most physically controlled and institutionally managed rivers in the world. It drains the largest river basin in the United States save the Mississippi. Prone to flooding and needed for irrigation, the river came under the control of several major dams in the 20<sup>th</sup> century. Management of these structures, of the water in the river, and the distribution of the water for various needs has resulted in a regulatory and legal framework now known as the “Law of the River.” Documents comprising the *Law* include:

- Colorado River Compact – 1922
- Boulder Canyon Project Act – 1928
- California Limitation Act – 1929
- California Seven Party Agreement – 1931
- Mexican Water Treaty – 1944
- Upper Colorado River Basin Compact – 1948
- Colorado River Storage Project Act – 1956
- United States Supreme Court Decree in Arizona vs. California – 1964
- Colorado River Basin Project Act – 1968
- Minute 242 of the International Boundary and Water Commission, United States and Mexico – 1973
- Colorado River Basin Salinity Control Act – 1974, amended 1984, 1995 and 1996

Wyoming’s ability to develop and consumptively use water in the Green River Basin primarily is constrained by the two interstate compacts, the *Colorado River Compact* and the *Upper Colorado River Basin Compact*. A summary of each of these compacts follows. Complete copies are contained in Appendix A to this memorandum.

### **The Colorado River Compact**

By the 1920s, development of the Colorado River for irrigation had progressed more rapidly in the lower basin reaches than in the upper and the need for flood control and municipal water throughout the basin was becoming more and more evident. Headwater states were growing nervous over development in the lower states and the concomitant threat that their own future uses could be curtailed. Because the many states each laid claim to Colorado River water within their boundaries, while the federal government asserted authority over this interstate (and, in fact, international) watercourse, some overarching agreement on the operation of the river was inevitable. The states of the Colorado River System include Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming.

With the creation of the Colorado River Commission in January of 1922, and appointment of commissioners from the basin states and the federal government, work on the compact began. Public hearings were held in all the affected states, and the resulting compact was signed by each commissioner and the representative of the United States on November 24, 1922 in Santa Fe, New Mexico. Because the signatory states and the federal government each were required to ratify the compact, the work was yet to be completed. The next year, six of the seven states (all but Arizona) ratified the compact. Without unanimity, however, the compact would not be binding. Legislation was passed in 1929 allowing the compact to come into effect if six of the seven states (one of which had to be California) ratified it, and it did so. Arizona finally ratified the compact in 1944.

The Colorado River Compact divided the Colorado River into two parts, an upper and a lower basin. The dividing point between the two is one mile below the mouth of the Paria River, at Lee Ferry, Arizona and is a natural point of demarcation. This point today is eight miles below Glen Canyon Dam. The *States of the Upper Division* were defined as Colorado, New Mexico, Utah and Wyoming and the *States of the Lower Division* included Arizona, California and Nevada. Under the hydrologic assumptions of the day, the yield of the upper river was deemed to be in the range of 15,000,000 acre-feet annually. To split the bounty, the compact apportions to each the upper and lower basins a total of 7,500,000 acre-feet of beneficial consumptive use annually and additionally grants the lower basin the right to increase its beneficial use by 1,000,000 acre-feet annually. Further, the compact requires that the States of the Upper Division cannot cause the flow at Lee Ferry to be depleted below an aggregate 75,000,000 acre-feet during any consecutive 10-year period. The compact also makes allowances for future treaties with Mexico. Essentially, deficiencies in meeting treaty obligations with Mexico shall be borne equally by the upper and lower basins.

Interestingly, the yield of the upper basin has not proved to be as robust as the compact represents. Different estimates have put the yield available for consumption in the upper basin from as low as 5,800,000 acre-feet per year up to at least 6,300,000 acre-feet per year, the latter of which is the current position of the upper basin states.

### **The Upper Colorado River Basin Compact**

While the lower basin states were initially unable to agree on how to use their compact allocation, the States of the Upper Basin were able to agree upon a division of the water so that development could begin. The Upper Colorado River Basin Compact, signed in October of 1948, followed the format of and was subject to the provisions of the original Colorado River Compact. This compact among the upper basin states apportioned 50,000 acre-feet of consumptive use to Arizona (which contains a small amount of area tributary to the Colorado above the compact point at Lee Ferry) and to the remaining states the following percentages of the total quantity available for use each year in the upper basin as provided by the 1922 compact (after deduction of Arizona's share):

Colorado =	51.75 percent;	New Mexico =	11.25 percent
Utah =	23.00 percent;	Wyoming =	14.00 percent

Taking into account the vagaries in knowledge of the actual yield of the upper basin, the likelihood that upper basin deliveries will be needed to help meet treaty obligations with Mexico, and a full 50,000 acre-foot development by Arizona, Wyoming's developable water under the two compacts can be estimated at between 728,000 and 1,043,000 acre-feet per year. Using best-case assumptions, the probable long-term available water supply for Wyoming from the Green River and its tributaries is

833,000 acre-feet per year. This number is supported by the Wyoming State Engineer's Office, and memoranda describing its derivation are included as Appendix B to this memorandum.

Appendix A

**Colorado River Compact  
&  
Upper Colorado River Basin Compact**

ARTICLE 3

COLORADO RIVER COMPACT

41-12-301. Generally.

Ratification and approval is hereby given to the Colorado River Compact as signed at the city of Santa Fe, New Mexico, on the twenty-fourth day of November, A.D. 1922, by Frank C. Emerson the duly appointed commissioner for the state of Wyoming, under and in accordance with the authority of the act of the sixteenth Wyoming legislature approved February 22, 1921, entitled: "An act providing for the appointment of a commissioner on behalf of the state of Wyoming to negotiate a compact or agreement between the states of Arizona, California, Colorado, Nevada, New Mexico, Utah and Wyoming, and between said states and the United States respecting the use and distribution of the waters of the Colorado River and tributaries, and the rights of said states, and the United States thereto", which compact was also signed by the duly authorized commissioners of the states of Arizona, California, Colorado, Nevada, New Mexico and Utah, and approved by the representative of the United States, which Colorado River Compact is in full as follows:

COLORADO RIVER COMPACT

Signed at Santa Fe, New Mexico,

November 24, 1922

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COLORADO RIVER COMMISSION,  
Herbert Hoover, chairman.

W. S. Norviel, commissioner for the state of Arizona.  
W. F. McClure, commissioner for the state of California.  
Delph E. Carpenter, commissioner for the state of Colorado.  
J. G. Scrugham, commissioner for the state of Nevada.  
Stephen B. Davis, Jr., commissioner for the state of New Mexico.  
R. E. Caldwell, commissioner for the state of Utah.  
Frank C. Emerson, commissioner for the state of Wyoming.  
Clarence C. Stetson, executive secretary, department of commerce,  
Washington, D.C.

#### COLORADO RIVER COMPACT

The states of Arizona, California, Colorado, Nevada, New Mexico, Utah and Wyoming, having resolved to enter into a compact under the act of the congress of the United States of America, approved August 19, 1921 (42 Statutes at Large, page 171) and the acts of legislatures of the said states, have, through their governors, appointed as their commissioners:

W. S. Norviel for the state of Arizona,  
W. F. McClure for the state of California,  
Delph E. Carpenter for the state of Colorado,  
J. G. Scrugham for the state of Nevada,  
Stephen B. Davis, Jr., for the state of New Mexico,  
R. E. Caldwell for the state of Utah,  
Frank C. Emerson for the state of Wyoming, who, after negotiations participated in by Herbert Hoover, appointed by the president as the representative of the United States of America, have agreed upon the following articles:

#### Article I

The major purposes of this compact are to provide for the equitable division and apportionment of the use of the waters of the Colorado River system; to establish the relative importance of different beneficial uses of water; to promote interstate comity; to remove causes of present and future controversies; and to secure the expeditious agricultural and industrial development of the Colorado River basin, the storage of its waters and the protection of life and property from floods. To these ends the Colorado River basin is divided into two basins, and an apportionment of the use of part of the water of the Colorado River system is made to each of them with the provision that further equitable apportionments may be made.

#### Article II

(a) As used in this compact:

(i) The term "Colorado River system" means that portion of the Colorado River and its tributaries within the United States of America;

(ii) The term "Colorado River basin" means all of the drainage area of the Colorado River System, and all other territory within the United States of America to which the waters

of the Colorado River system shall be beneficially applied;

(iii) The term "states of the upper division" means the states of Colorado, New Mexico, Utah and Wyoming;

(iv) The term "states of the lower division" means the states of Arizona, California and Nevada;

(v) The term "Lee Ferry" means a point in the main stream of Colorado River one mile below the mouth of the Paria River;

(vi) The term "upper basin" means those parts of the states of Arizona, Colorado, New Mexico, Utah and Wyoming within and from which waters naturally drain into the Colorado River system above Lee Ferry, and also all parts of said states located without the drainage area of the Colorado River system which are now or shall hereafter be beneficially served by waters diverted from the system above Lee Ferry;

(vii) The term "lower basin" means those parts of the states of Arizona, California, Nevada, New Mexico and Utah within and from which waters naturally drain into the Colorado River system below Lee Ferry, and also all parts of said states located without the drainage area of the Colorado River system which are now or shall hereafter be beneficially served by waters diverted from the system below Lee Ferry;

(viii) The term "domestic use" shall include the use of water for household, stock, municipal, mining, milling, industrial and other like purposes, but shall exclude the generation of electrical power.

### Article III

(a) There is hereby apportioned from the Colorado River system in perpetuity to the upper basin and to the lower basin respectively the exclusive beneficial consumptive use of seven million five hundred thousand (7,500,000) acre-feet of water per annum, which shall include all water necessary for the supply of any rights which may not exist.

(b) In addition to the apportionment in paragraph (a), the lower basin is hereby given the right to increase its beneficial consumptive use of such waters by one million (1,000,000) acre-feet per annum.

(c) If, as a matter of international comity, the United States of America shall hereafter recognize in the United States of Mexico any right to the use of any waters of the Colorado River system, such waters shall be supplied first from the waters which are surplus over and above the aggregate of the quantities specified in paragraphs (a) and (b); and if such surplus shall prove insufficient for this purpose, then, the burden of such deficiency shall be equally borne by the upper basin and the lower basin, and whenever necessary the states of the upper division shall deliver at Lee Ferry water to supply one-half of the deficiency so recognized in addition to that provided in

paragraph (d).

(d) The states of the upper division will not cause the flow of the river at Lee Ferry to be depleted below an aggregate of seventy-five million (75,000,000) acre-feet for any period of ten (10) consecutive years reckoned in continuing progressive series, beginning with the first day of October next succeeding the ratification of this compact.

(e) The states of the upper division shall not withhold water, and the states of the lower division shall not require the delivery of water, which cannot reasonably be applied to domestic and agricultural uses.

(f) Further equitable apportionment of the beneficial uses of the waters of the Colorado River system unapportioned by paragraphs (a), (b) and (c) may be made in the manner provided in paragraph (g) at any time after October first, 1963, if and when either basin shall have reached its total beneficial consumptive use as set out in paragraphs (a) and (b).

(g) In the event of a desire for a further apportionment as provided in paragraph (f) any two (2) signatory states, acting through their governors, may give joint notice of such desire to the governors of the other signatory states and to the president of the United States of America, and it shall be the duty of the governors of the signatory states and of the president of the United States of America forthwith to appoint representatives, whose duty it shall be to divide and apportion equitably between the upper basin and lower basin the beneficial use of the unapportioned water of the Colorado River System as mentioned in paragraph (f), subject to the legislative ratification of the signatory states and the congress of the United States of America.

#### Article IV

(a) Inasmuch as the Colorado River has ceased to be navigable for commerce and the reservation of its waters for navigation would seriously limit the development of its basin, the use of its waters for purposes of navigation shall be subservient to the uses of such waters for domestic, agricultural and power purposes. If the congress shall not consent to this paragraph, the other provisions of this compact shall nevertheless remain binding.

(b) Subject to the provisions of this compact, water of the Colorado River system may be impounded and used for the generation of electrical power, but such impounding and use shall be subservient to the use and consumption of such water for agricultural and domestic purposes and shall not interfere with or prevent use for such dominant purposes.

(c) The provisions of this article shall not apply to or interfere with the regulation and control by any state within its boundaries of the appropriation, use and distribution of water.

## Article V

(a) The chief official of each signatory state charged with the administration of water rights, together with the director of the United States reclamation service and the director of the United States geological survey shall cooperate, ex officio:

(i) To promote the systematic determination and coordination of the facts as to flow, appropriation, consumption and use of water in the Colorado River basin, and the interchange of available information in such matters.

(ii) To secure the ascertainment and publication of the annual flow of the Colorado River at Lee Ferry.

(iii) To perform such other duties as may be assigned by mutual consent of the signatories from time to time.

## Article VI

(a) Should any claim or controversy arise between any two (2) or more of the signatory states: (i) with respect to the waters of the Colorado River system not covered by the terms of this compact; (ii) over the meaning or performance of any of the terms of this compact; (iii) as to the allocation of the burdens incident to the performance of any article of this compact or the delivery of waters as herein provided; (iv) as to the construction or operation of works within the Colorado River basin to be situated in two (2) or more states, or to be constructed in one (1) state for the benefit of another state; or (v) as to the diversion of water in one (1) state for the benefit of another state; the governors of the states affected, upon the request of one (1) of them, shall forthwith appoint commissioners with power to consider and adjust such claim or controversy, subject to ratification by the legislatures of the states so affected.

(b) Nothing herein contained shall prevent the adjustment of any such claim or controversy by any present method or by direct future legislative action of the interested states.

## Article VII

Nothing in this compact shall be construed as affecting the obligations of the United States of America to Indian tribes.

## Article VIII

(a) Present perfected rights to the beneficial use of waters of the Colorado River system are unimpaired by this compact. Whenever storage capacity of five million (5,000,000) acre-feet shall have been provided on the main Colorado River within or for the benefit of the lower basin, then claims of such rights, if any, by appropriators or users of water in the lower basin against appropriators or users of water in the upper basin shall attach to and be satisfied from water that may be stored not in conflict with article III.

ARTICLE 4  
UPPER COLORADO RIVER BASIN COMPACT

41-12-401. Generally.

That ratification and approval is hereby given to the Upper Colorado River Basin Compact as signed at the city of Santa Fe, in the state of New Mexico, on the 11th day of October, A.D. 1948, by L. C. Bishop, the state engineer of the state of Wyoming, under and in accordance with the authority of the act of the twenty-sixth Wyoming legislature approved the 24th day of February, 1941, entitled "An act relating to the appointment of interstate streams commissioner and assistant commissioners to negotiate agreements relative to interstate streams and providing for the governor of Wyoming to notify the governors of other states as to the appointment of said commissioner, detailing the authority of said commissioner", (now section 71-2601, Wyoming Compiled Statutes, 1945) which compact was also signed by the duly authorized commissioners of the states of Arizona, Colorado, New Mexico and Utah and approved by the representative of the United States, which Upper Colorado River Basin Compact is in full as follows:

UPPER COLORADO RIVER BASIN COMPACT

The state of Arizona, the state of Colorado, the state of New Mexico, the state of Utah and the state of Wyoming, acting through their commissioners,

Charles A. Carson for the state of Arizona,  
Clifford H. Stone for the state of Colorado,  
Fred E. Wilson for the state of New Mexico,  
Edward H. Watson for the state of Utah and  
L. C. Bishop for the state of Wyoming,

after negotiations participated in by Harry W. Bashore, appointed by the president as the representative of the United States of America, have agreed, subject to the provisions of the Colorado River Compact, to determine the rights and obligations of each signatory state respecting the uses and deliveries of the water of the upper basin of the Colorado River, as follows:

Article I

(a) The major purposes of this compact are to provide for the equitable division and apportionment of the use of the waters of the Colorado River system, the use of which was apportioned in perpetuity to the upper basin by the Colorado River Compact; to establish the obligations of each state of the upper division with respect to the deliveries of water required to be made at Lee Ferry by the Colorado River Compact; to promote interstate comity; to remove causes of present and future controversies; to secure the expeditious agricultural and industrial development of the upper basin, the storage of water and to protect life and

property from floods.

(b) It is recognized that the Colorado River Compact is in full force and effect and all of the provisions hereof are subject thereto.

## Article II

(a) As used in this compact:

(i) The term "Colorado River system" means that portion of the Colorado River and its tributaries within the United States of America;

(ii) The term "Colorado River basin" means all of the drainage area of the Colorado River system and all other territory within the United States of America to which the waters of the Colorado River system shall be beneficially applied;

(iii) The term "states of the upper division" means the states of Colorado, New Mexico, Utah and Wyoming;

(iv) The term "states of the lower division" means the states of Arizona, California and Nevada;

(v) The term "Lee Ferry" means a point in the main stream of the Colorado River one (1) mile below the mouth of the Paria River;

(vi) The term "upper basin" means those parts of the states of Arizona, Colorado, New Mexico, Utah and Wyoming within and from which waters naturally drain into the Colorado River system above Lee Ferry, and also all parts of said states located without the drainage area of the Colorado River system which are now or shall hereafter be beneficially served by waters diverted from the Colorado River system above Lee Ferry;

(vii) The term "lower basin" means those parts of the states of Arizona, California, Nevada, New Mexico and Utah within and from which waters naturally drain into the Colorado River system below Lee Ferry, and also all parts of said states located without the drainage area of the Colorado River system which are now or shall hereafter be beneficially served by waters diverted from the Colorado River system below Lee Ferry;

(viii) The term "Colorado River Compact" means the agreement concerning the apportionment of the use of the waters of the Colorado River system dated November 24, 1922, executed by commissioners for the states of Arizona, California, Colorado, Nevada, New Mexico, Utah and Wyoming, approved by Herbert Hoover, representative of the United States of America, and proclaimed effective by the president of the United States of America, June 25, 1929;

(ix) The term "upper Colorado River system" means that portion of the Colorado River system above Lee Ferry;

(x) The term "commission" means the administrative agency created by article VIII of this compact;

(xi) The term "water year" means that period of twelve (12) months ending September 30 of each year;

(xii) The term "acre-foot" means the quantity of water required to cover an acre to the depth of one (1) foot and is equivalent to forty-three thousand five hundred sixty (43,560) cubic feet;

(xiii) The term "domestic use" shall include the use of water for household, stock, municipal, mining, milling, industrial and other like purposes, but shall exclude the generation of electrical power;

(xiv) The term "virgin flow" means the flow of any stream undepleted by the activities of man.

### Article III

(a) Subject to the provisions and limitations contained in the Colorado River Compact and in this compact, there is hereby apportioned from the upper Colorado River system in perpetuity to the states of Arizona, Colorado, New Mexico, Utah and Wyoming, respectively, the consumptive use of water as follows:

(i) To the state of Arizona the consumptive use of fifty thousand (50,000) acre-feet of water per annum.

(ii) To the states of Colorado, New Mexico, Utah and Wyoming, respectively, the consumptive use per annum of the quantities resulting from the application of the following percentages to the total quantity of consumptive use per annum apportioned in perpetuity to and available for use each year by upper basin under the Colorado River Compact and remaining after the deduction of the use, not to exceed fifty thousand (50,000) acre-feet per annum, made in the state of Arizona.

(A) State of Colorado .... fifty-one and seventy-five hundredths percent (51.75%),

(B) State of New Mexico .... eleven and twenty-five hundredths percent (11.25%),

(C) State of Utah .... twenty-three percent (23%),

(D) State of Wyoming .... fourteen percent (14%).

(b) The apportionment made to the respective states by paragraph (a) of this article is based upon, and shall be applied in conformity with, the following principles and each of them:

(i) The apportionment is of any and all man-made depletions;

(ii) Beneficial use is the basis, the measure and the

limit of the right to use;

(iii) No state shall exceed its apportioned use in any water year when the effect of such excess use, as determined by the commission, is to deprive another signatory state of its apportioned use during that water year; provided, that this subparagraph (b)(iii) shall not be construed as:

(A) Altering the apportionment of use, or obligations to make deliveries as provided in articles XI, XII, XIII or XIV of this compact;

(B) Purporting to apportion among the signatory states such uses of water as the upper basin may be entitled to under paragraphs (f) and (g) of article III of the Colorado River Compact; or

(C) Countenancing average uses by any signatory state in excess of its apportionment.

(iv) The apportionment to each state includes all water necessary for the supply of any rights which now exist.

(c) No apportionment is hereby made, or intended to be made, of such uses of water as the upper basin may be entitled to under paragraphs (f) and (g) of article III of the Colorado River Compact.

(d) The apportionment made by this article shall not be taken as any basis for the allocation among the signatory states of any benefits resulting from the generation of power.

#### Article IV

(a) In the event curtailment of use of water by the states of the upper division at any time shall become necessary in order that the flow at Lee Ferry shall not be depleted below that required by article III of the Colorado River Compact, the extent of curtailment by each state of the consumptive use of water apportioned to it by article III of this compact shall be in such quantities and at such times as shall be determined by the commission upon the application of the following principles:

(i) The extent and times of curtailment shall be such as to assure full compliance with article III of the Colorado River Compact;

(ii) If any state or states of the upper division, in the ten (10) years immediately preceding the water year in which curtailment is necessary, shall have consumptively used more water than it was or they were, as the case may be, entitled to use under the apportionment made by article III of this compact, such state or states shall be required to supply at Lee Ferry a quantity of water equal to its, or the aggregate of their, overdraft or the proportionate part of such overdraft, as may be necessary to assure compliance with article III of the Colorado River Compact, before demand is made on any other state of the

upper division;

(iii) Except as provided in subparagraph (ii) of this article, the extent of curtailment by each state of the upper division of the consumptive use of water apportioned to it by article III of this compact shall be such as to result in the delivery at Lee Ferry of a quantity of water which bears the same relation to the total required curtailment of use by the states of the upper division as the consumptive use of upper Colorado River system water which was made by each such state during the water year immediately preceding the year in which the curtailment becomes necessary bears to the total consumptive use of such water in the states of the upper division during the same water year; provided, that in determining such relation the uses of water under rights perfected prior to November 24, 1922, shall be excluded.

#### Article V

(a) All losses of water occurring from or as the result of the storage of water in reservoirs constructed prior to the signing of this compact shall be charged to the state in which such reservoir or reservoirs are located. Water stored in reservoirs covered by this paragraph (a) shall be for the exclusive use of and shall be charged to the state in which the reservoir or reservoirs are located.

(b) All losses of water occurring from or as the result of the storage of water in reservoirs constructed after the signing of this compact shall be charged as follows:

(i) If the commission finds that the reservoir is used, in whole or in part, to assist the states of the upper division in meeting their obligations to deliver water at Lee Ferry imposed by article III of the Colorado River Compact, the commission shall make findings, which in no event shall be contrary to the laws of the United States of America under which any reservoir is constructed, as to the reservoir capacity allocated for that purpose. The whole or that proportion, as the case may be, of reservoir losses as found by the commission to be reasonably and properly chargeable to the reservoir or reservoir capacity utilized to assure deliveries at Lee Ferry shall be charged to the states of the upper division in the proportion which the consumptive use of water in each state of the upper division during the water year in which the charge is made bears to the total consumptive use of water in all states of the upper division during the same water year. Water stored in reservoirs or in reservoir capacity covered by this subparagraph (b)(i) shall be for the common benefit of all of the states of the upper division.

(ii) If the commission finds that the reservoir is used, in whole or in part, to supply water for use in a state of the upper division, the commission shall make findings, which in no event shall be contrary to the laws of the United States of America under which any reservoir is constructed, as to the reservoir or reservoir capacity utilized to supply water for use

and the state in which such water will be used. The whole or that proportion, as the case may be, of reservoir losses as found by the commission to be reasonably and properly chargeable to the state in which such water will be used shall be borne by that state. As determined by the commission, water stored in reservoirs covered by this subparagraph (b)(ii) shall be earmarked for and charged to the state in which the water will be used.

(c) In the event the commission finds that a reservoir site is available both to assure deliveries at Lee Ferry and to store water for consumptive use in a state of the upper division, the storage of water for consumptive use shall be given preference. Any reservoir or reservoir capacity hereafter used to assure deliveries at Lee Ferry shall by order of the commission be used to store water for consumptive use in a state, provided the commission finds that such storage is reasonably necessary to permit such state to make the use of the water apportioned to it by this compact.

#### Article VI

The commission shall determine the quantity of the consumptive use of water, which use is apportioned by article III hereof, for the upper basin and for each state of the upper basin by the inflow-outflow method in terms of man-made depletions of the virgin flow at Lee Ferry, unless the commission, by unanimous action, shall adopt a different method of determination.

#### Article VII

The consumptive use of water by the United States of America or any of its agencies, instrumentalities or wards shall be charged as a use by the state in which the use is made; provided, that such consumptive use incident to the diversion, impounding, or conveyance of water in one state for use in another shall be charged to such latter state.

#### Article VIII

(a) There is hereby created an interstate administrative agency to be known as the "Upper Colorado River Commission". The commission shall be composed of one (1) commissioner representing each of the states of the upper division, namely, the states of Colorado, New Mexico, Utah and Wyoming, designated or appointed in accordance with the laws of each such state and, if designated by the president, one (1) commissioner representing the United States of America. The president is hereby requested to designate a commissioner. If so designated the commissioner representing the United States of America shall be the presiding officer of the commission and shall be entitled to the same powers and rights as the commissioner of any state. Any four (4) members of the commission shall constitute a quorum.

(b) The salaries and personal expenses of each commissioner shall be paid by the government which he represents. All other expenses which are incurred by the commission incident to the

administration of this compact, and which are not paid by the United States of America, shall be borne by the four (4) states according to the percentage of consumptive use apportioned to each. On or before December 1 of each year, the commission shall adopt and transmit to the governors of the four (4) states and to the president a budget covering an estimate of its expenses for the following year, and of the amount payable by each state. Each state shall pay the amount due by it to the commission on or before April 1 of the year following. The payment of the expenses of the commission and of its employees shall not be subject to the audit and accounting procedures of any of the four (4) states; however, all receipt and disbursement of funds handled by the commission shall be audited yearly by a qualified independent public accountant and the report of the audit shall be included in and become a part of the annual report of the commission.

(c) The commission shall appoint a secretary, who shall not be a member of the commission, or an employee of any signatory state or of the United States of America while so acting. He shall serve for such term and receive such salary and perform such duties as the commission may direct. The commission may employ such engineering, legal, clerical and other personnel as, in its judgment, may be necessary for the performance of its functions under this compact. In the hiring of employees, the commission shall not be bound by the civil service laws of any state.

(d) The commission, so far as consistent with this compact, shall have the power to:

(i) Adopt rules and regulations;

(ii) Locate, establish, construct, abandon, operate and maintain water gauging stations;

(iii) Make estimates to forecast water run-off on the Colorado River and any of its tributaries;

(iv) Engage in cooperative studies of water supplies of the Colorado River and its tributaries;

(v) Collect, analyze, correlate, preserve and report on data as to the stream flows, storage, diversions and use of the waters of the Colorado River, and any of its tributaries;

(vi) Make findings as to the quantity of water of the upper Colorado River system used each year in the upper Colorado River basin and in each state thereof;

(vii) Make findings as to the quantity of water deliveries at Lee Ferry during each water year;

(viii) Make findings as to the necessity for and the extent of the curtailment of use, required, if any, pursuant to article IV hereof;

(ix) Make findings as to the quantity of reservoir losses

and as to the share thereof chargeable under article V hereof to each of the states;

(x) Make findings of fact in the event of the occurrence of extraordinary drought or serious accident to the irrigation system in the upper basin, whereby deliveries by the upper basin of water which it may be required to deliver in order to aid in fulfilling obligations of the United States of America to the United Mexican States arising under the treaty between the United States of America and the United Mexican States, dated February 3, 1944 (Treaty Series 994) become difficult, and report such findings to the governors of the upper basin states, the president of the United States of America, the United States section of the international boundary and water commission, and such other federal officials and agencies as it may deem appropriate to the end that the water allotted to Mexico under division III of such treaty may be reduced in accordance with the terms of such treaty;

(xi) Acquire and hold such personal and real property as may be necessary for the performance of its duties hereunder and to dispose of the same when no longer required;

(xii) Perform all functions required of it by this compact and do all things necessary, proper or convenient in the performance of its duties hereunder, either independently or in cooperation with any state or federal agency;

(xiii) Make and transmit annually to the governors of the signatory states and the president of the United States of America, with the estimated budget, a report covering the activities of the commission for the preceding water year.

(e) Except as otherwise provided in this compact the concurrence of four members of the commission shall be required in any action taken by it.

(f) The commission and its secretary shall make available to the governor of each of the signatory states any information within its possession at any time, and shall always provide free access to its records by the governors of each of the states, or their representatives, or authorized representatives of the United States of America.

(g) Findings of fact made by the commission shall not be conclusive in any court, or before any agency or tribunal, but shall constitute prima facie evidence of the facts found.

(h) The organization meeting of the commission shall be held within four (4) months from the effective date of this compact.

#### Article IX

(a) No state shall deny the right of the United States of America and, subject to the conditions hereinafter contained, no state shall deny the right of another signatory state, any person, or entity of any signatory state to acquire rights to the

use of water, or to construct or participate in the construction and use of diversion works and storage reservoirs with appurtenant works, canals and conduits in one (1) state for the purpose of diverting, conveying, storing, regulating and releasing water to satisfy the provisions of the Colorado River Compact relating to the obligation of the states of the upper division to make deliveries of water at Lee Ferry, or for the purpose of diverting, conveying, storing or regulating water in any upper signatory state for consumptive use in a lower signatory state, when such use is within the apportionment to such lower state made by this compact. Such rights shall be subject to the rights of water users, in a state in which such reservoir or works are located, to receive and use water, the use of which is within the apportionment to such state by this compact.

(b) Any signatory state, any person or any entity of any signatory state shall have the right to acquire such property rights as are necessary to the use of water in conformity with this compact in any other signatory state by donation, purchase or through the exercise of the power of eminent domain. Any signatory state, upon the written request of the governor of any other signatory state, for the benefit of whose water users property is to be acquired in the state to which such written request is made, shall proceed expeditiously to acquire the desired property either by purchase at a price satisfactory to the requesting state, or, if such purchase cannot be made, then through the exercise of its power of eminent domain and shall convey such property to the requesting state or such entity as may be designated by the requesting state; provided, that all costs of acquisition and expenses of every kind and nature whatsoever incurred in obtaining the requested property shall be paid by the requesting state at the time and in the manner prescribed by the state requested to acquire the property.

(c) Should any facility be constructed in a signatory state by and for the benefit of another signatory state or states or the water users thereof, as above provided, the construction, repair, replacement, maintenance and operation of such facility shall be subject to the laws of the state in which the facility is located, except that, in the case of a reservoir constructed in one state for the benefit of another state or states, the water administration officials of the state in which the facility is located shall permit the storage and release of any water which, as determined by findings of the commission, falls within the apportionment of the state or states for whose benefit the facility is constructed. In the case of a regulating reservoir for the joint benefit of all states in making Lee Ferry deliveries, the water administration officials of the state in which the facility is located, in permitting the storage and release of water, shall comply with the findings and orders of the commission.

(d) In the event property is acquired by a signatory state in another signatory state for the use and benefit of the former, the users of water made available by such facilities, as a condition precedent to the use thereof, shall pay to the

political subdivisions of the state in which such works are located, each and every year during which such rights are enjoyed for such purposes, a sum of money equivalent to the average annual amount of taxes levied and assessed against the land and improvements thereon during the ten (10) years preceding the acquisition of such land. Said payments shall be in full reimbursement for the loss of taxes in such political subdivisions of the state, and in lieu of any and all taxes on said property, improvements and rights. The signatory states recommend to the president and the congress that, in the event the United States of America shall acquire property in one of the signatory states for the benefit of another signatory state, or its water users, provision be made for like payment in reimbursement of loss of taxes.

#### Article X

(a) The signatory states recognize La Plata River Compact entered into between the states of Colorado and New Mexico, dated November 27, 1922, approved by the congress on January 29, 1925 (43 Stat. 796), and this compact shall not affect the apportionment therein made.

(b) All consumptive use of water of La Plata River and its tributaries shall be charged under the apportionment of article III hereof to the state in which the use is made; provided, that consumptive use incident to the diversion, impounding or conveyance of water in one state for use in the other shall be charged to the latter state.

#### Article XI

(a) Subject to the provisions of this compact, the consumptive use of the water of the Little Snake River and its tributaries is hereby apportioned between the states of Colorado and Wyoming in such quantities as shall result from the application of the following principles and procedures:

(i) Water Used Under Rights Existing Prior to the Signing of This Compact:

(A) Water diverted from any tributary of the Little Snake River or from the main stem of the Little Snake River above a point one hundred (100) feet below the confluence of Savery Creek and the Little Snake River shall be administered without regard to rights covering the diversion of water from any downstream points.

(B) Water diverted from the main stem of the Little Snake River below a point one hundred (100) feet below the confluence of Savery Creek and the Little Snake River shall be administered on the basis of an interstate priority schedule prepared by the commission in conformity with priority dates established by the laws of the respective states.

(ii) Water Used Under Rights Initiated Subsequent to the Signing of This Compact:

(A) Direct flow diversions shall be so administered that, in time of shortage, the curtailment of use on each acre of land irrigated thereunder shall be as nearly equal as may be possible in both of the states.

(B) The storage of water by projects located in either state, whether of supplemental supply or of water used to irrigate land not irrigated at the date of the signing of this compact, shall be so administered that in times of water shortage the curtailment of storage water available for each acre of land irrigated thereunder shall be as nearly equal as may be possible in both states.

(iii) Water uses under the apportionment made by this article shall be in accordance with the principle that beneficial use shall be the basis, measure and limit of the right to use.

(iv) The states of Colorado and Wyoming each assent to diversions and storage of water in one (1) state for use in the other state, subject to compliance with article IX of this compact.

(v) In the event of the importation of water to the Little Snake River basin from any other river basin, the state making the importation shall have the exclusive use of such imported water unless by written agreement, made by the representatives of the states of Colorado and Wyoming on the commission, it is otherwise provided.

(vi) Water use projects initiated after the signing of this compact, to the greatest extent possible, shall permit the full use within the basin in the most feasible manner of the waters of the Little Snake River and its tributaries, without regard to the state line; and, so far as is practicable, shall result in an equal division between the states of the use of water not used under rights existing prior to the signing of this compact.

(vii) All consumptive use of the waters of the Little Snake River and its tributaries shall be charged under the apportionment of article III hereof to the state in which the use is made; provided, that consumptive use incident to the diversion, impounding or conveyance of water in one (1) state for use in the other shall be charged to the latter state.

#### Article XII

(a) Subject to the provisions of this compact, the consumptive use of the waters of Henry's Fork, a tributary of Green River originating in the state of Utah and flowing into the state of Wyoming and thence into the Green River in the state of Utah; Beaver Creek, originating in the state of Utah and flowing into Henry's Fork in the state of Wyoming; Burnt Fork, a tributary of Henry's Fork, originating in the state of Utah and flowing into Henry's Fork in the state of Wyoming; Birch Creek, a tributary of Henry's Fork originating in the state of Utah and

flowing into Henry's Fork in the state of Wyoming; and Sheep Creek, a tributary of Green River in the state of Utah, and their tributaries, are hereby apportioned between the states of Utah and Wyoming in such quantities as will result from the application of the following principles and procedures:

(i) Waters diverted from Henry's Fork, Beaver Creek, Burnt Fork, Birch Creek and their tributaries, shall be administered without regard to the state line on the basis of an interstate priority schedule to be prepared by the states affected and approved by the commission in conformity with the actual priority of right of use, the water requirements of the land irrigated and the acreage irrigated in connection therewith.

(ii) Waters used under rights from Henry's Fork, Beaver Creek, Burnt Fork, Birch Creek and their tributaries, initiated after the signing of this compact shall be divided fifty percent (50%) to the state of Wyoming and fifty percent (50%) to the state of Utah and each state may use said waters as and where it deems advisable.

(iii) The state of Wyoming assents to the exclusive use by the state of Utah of the water of Sheep Creek, except that the lands, if any, presently irrigated in the state of Wyoming from the water of Sheep Creek shall be supplied with water from Sheep Creek in order of priority and in such quantities as are in conformity with the laws of the state of Utah.

(iv) In the event of the importation of water to Henry's Fork, or any of its tributaries, from any other river basin, the state making the importation shall have the exclusive use of such imported water unless by written agreement made by the representatives of the states of Utah and Wyoming on the commission, it is otherwise provided.

(v) All consumptive use of waters of Henry's Fork, Beaver Creek, Burnt Fork, Birch Creek, Sheep Creek, and their tributaries shall be charged under the apportionment of article III hereof to the state in which the use is made; provided, that consumptive use incident to the diversion, impounding or conveyance of water in one (1) state for use in the other shall be charged to the latter state.

(vi) The states of Utah and Wyoming each assent to the diversion and storage of water in one (1) state for use in the other state, subject to compliance with article IX of this compact. It shall be the duty of the water administrative officials of the state where the water is stored to release said stored water to the other state upon demand. If either the state of Utah or the state of Wyoming shall construct a reservoir in the other state for use in its own state, the water users of the state in which said facilities are constructed may purchase at cost a portion of the capacity of said reservoir sufficient for the irrigation of their lands thereunder.

(vii) In order to measure the flow of water diverted, each state shall cause suitable measuring devices to be constructed,

maintained and operated at or near the point of diversion into each ditch.

(viii) The state engineers of the two (2) states jointly shall appoint a special water commissioner who shall have authority to administer the water in both states in accordance with the terms of this article. The salary and expenses of such special water commissioner shall be paid, thirty percent (30%) by the state of Utah and seventy percent (70%) by the state of Wyoming.

#### Article XIII

(a) Subject to the provisions of this compact, the rights to the consumptive use of the water of the Yampa River, a tributary entering the Green River in the state of Colorado, are hereby apportioned between the states of Colorado and Utah in accordance with the following principles:

(i) The state of Colorado will not cause the flow of the Yampa River at the Maybell Gaging Station to be depleted below an aggregate of five million (5,000,000) acre-feet for any period of ten (10) consecutive years reckoned in continuing progressive series beginning with the first day of October next succeeding the ratification and approval of this compact. In the event any diversion is made from the Yampa River or from tributaries entering the Yampa River above the Maybell Gaging Station for the benefit of any water use project in the state of Utah, then the gross amount of all such diversions for use in the state of Utah, less any returns from such diversions to the river above Maybell, shall be added to the actual flow at the Maybell Gaging Station to determine the total flow at the Maybell Gaging Station.

(ii) All consumptive use of the waters of the Yampa River and its tributaries shall be charged under the apportionment of article III hereof to the state in which the use is made; provided, that consumptive use incident to the diversion, impounding or conveyance of water in one (1) state for use in the other shall be charged to the latter state.

#### Article XIV

(a) Subject to the provisions of this compact, the consumptive use of the waters of the San Juan River and its tributaries is hereby apportioned between the states of Colorado and New Mexico as follows:

(i) The state of Colorado agrees to deliver to the state of New Mexico from the San Juan River and its tributaries which rise in the state of Colorado a quantity of water which shall be sufficient, together with water originating in the San Juan basin in the state of New Mexico, to enable the state of New Mexico to make full use of the water apportioned to the state of New Mexico by article III of this compact, subject however, to the following:

(A) A first and prior right shall be recognized as to:

(I) All uses of water made in either state at the time of the signing of this compact; and

(II) All uses of water contemplated by projects authorized, at the time of the signing of this compact, under the laws of the United States of America whether or not such projects are eventually constructed by the United States of America or by some other entity.

(B) The state of Colorado assents to diversions and storage of water in the state of Colorado for use in the state of New Mexico, subject to compliance with article IX of this compact.

(C) The uses of the waters of the San Juan River and any of its tributaries within either state which are dependent upon a common source of water and which are not covered by (A) hereof, shall in times of water shortages be reduced in such quantity that the resulting consumptive use in each state will bear the same proportionate relation to the consumptive use made in each state during times of average water supply as determined by the commission; provided, that any preferential uses of water to which Indians are entitled under article XIX shall be excluded in determining the amount of curtailment to be made under this paragraph.

(D) The curtailment of water use by either state in order to make deliveries at Lee Ferry as required by article IV of this compact shall be independent of any and all conditions imposed by this article and shall be made by each state, as and when required, without regard to any provision of this article.

(E) All consumptive use of the waters of the San Juan River and its tributaries shall be charged under the apportionment of article III hereof to the state in which the use is made; provided, that consumptive use incident to the diversion, impounding or conveyance of water in one (1) state for use in the other shall be charged to the latter state.

#### Article XV

(a) Subject to the provisions of the Colorado River Compact and of this compact, water of the upper Colorado River system may be impounded and used for the generation of electrical power, but such impounding and use shall be subservient to the use and consumption of such water for agricultural and domestic purposes and shall not interfere with or prevent use for such dominant purposes.

(b) The provisions of this compact shall not apply to or interfere with the right or power of any signatory state to regulate within its boundaries the appropriation, use and control of water, the consumptive use of which is apportioned and available to such state by this compact.

#### Article XVI

The failure of any state to use the water, or any part thereof, the use of which is apportioned to it under the terms of this compact, shall not constitute a relinquishment of the right to such use to the lower basin or to any other state, nor shall it constitute a forfeiture or abandonment of the right to such use.

#### Article XVII

The use of any water now or hereafter imported into the natural drainage basin of the upper Colorado River system shall not be charged to any state under the apportionment of consumptive use made by this compact.

#### Article XVIII

(a) The state of Arizona reserves its rights and interests under the Colorado River Compact as a state of the lower division and as a state of the lower basin.

(b) The state of New Mexico and the state of Utah reserve their respective rights and interests under the Colorado River Compact as states of the lower basin.

#### Article XIX

(a) Nothing in this compact shall be construed as:

(i) Affecting the obligations of the United States of America to Indian tribes;

(ii) Affecting the obligations of the United States of America under the treaty with the United Mexican States (Treaty Series 994);

(iii) Affecting any rights or powers of the United States of America, its agencies or instrumentalities, in or to the waters of the Upper Colorado River system, or its capacity to acquire rights in and to the use of said waters;

(iv) Subjecting any property of the United States of America, its agencies or instrumentalities, to taxation by any state or subdivision thereof, or creating any obligation on the part of the United States of America, its agencies or instrumentalities, by reason of the acquisition, construction or operation of any property or works of whatever kind, to make any payment to any state or political subdivision thereof, state agency, municipality or entity whatsoever, in reimbursement for the loss of taxes;

(v) Subjecting any property of the United States of America, its agencies or instrumentalities, to the laws of any state to an extent other than the extent to which such laws would apply without regard to this compact.

#### Article XX

This compact may be terminated at any time by the unanimous agreement of the signatory states. In the event of such termination, all rights established under it shall continue unimpaired.

Article XXI

This compact shall become binding and obligatory when it shall have been ratified by the legislatures of each of the signatory states and approved by the congress of the United States of America. Notice of ratification by the legislatures of the signatory states shall be given by the governor of each signatory state to the governor of each of the other signatory states and to the president of the United States of America, and the president is hereby requested to give notice to the governor of each of the signatory states of approval by the congress of the United States of America.

IN WITNESS WHEREOF, the commissioners have executed six (6) counterparts hereof each of which shall be and constitute an original, one (1) of which shall be deposited in the archives of the department of state of the United States of America, and one (1) of which shall be forwarded to the governor of each of the signatory states.

Done at the city of Santa Fe, state of New Mexico, this 11th day of October, 1948.

/s/ Charles A. Carson  
Charles A. Carson  
Commissioner for the State of Arizona  
/s/ Clifford H. Stone  
Clifford H. Stone  
Commissioner for the State of Colorado  
/s/ Fred E. Wilson  
Fred E. Wilson  
Commissioner for the State of New Mexico  
/s/ Edward H. Watson  
Edward H. Watson  
Commissioner for the State of Utah  
/s/ L. C. Bishop  
L. C. Bishop  
Commissioner for the State of Wyoming  
/s/ Grover A. Giles  
Grover A. Giles, secretary

Approved:

/s/ Harry W. Bashore  
Harry W. Bashore  
Representative of the United States of America.

41-12-402. When binding; notice of ratification.

Said compact shall not be binding or obligatory upon any of the high contracting parties thereto unless and until the same shall have been ratified by the legislature of each of the said states and approved by the congress of the United States. The governor of Wyoming shall give notice of the ratification and approval of said compact by the thirtieth Wyoming legislature to the governors of the states of Arizona, Colorado, New Mexico and Utah, and to the president of the United States.

Appendix B

**Memoranda Regarding the Upper Colorado River Basin  
Compact**

by:

John W. Shields

Interstate Streams Engineer

Wyoming State Engineer's Office

January 21, 2000

**MEMORANDUM**

TO: Meg Franz, Senior Engineer, Boyle Engineering Corporation

FROM: John W. Shields, Interstate Streams Engineer, State Engineer's Office

SUBJECT: Administration of the Upper Colorado River Basin Compact in Wyoming - Article IV and XI Provisions, Water Supply Assumptions and Compact Delivery Requirements

In accordance with our conversation in Green River at the Green River Basin Advisory Group meeting on January 11, I have prepared this memorandum to address the "Compact constraints" that should be considered in the development of spreadsheet models for the Green River Basin Water Plan. This memo addresses several matters, including the applicable assumptions regarding the long-term water supply available for the Upper Colorado River Basin, delivery requirements and other aspects of the administration of the Upper Colorado River Basin Compact. Please feel free to contact me if you have questions and to discuss matters that I fail to address herein.

**The Upper Colorado River Basin Compact**

While the Lower Basin States were unable to agree upon an internal division of the Colorado River waters assumed apportioned to the Lower Basin by the Colorado River Compact of 1922, the Upper Basin States were able to agree upon such a division in order that development could be initiated in those States.

On October 11, 1948, the Upper Basin States entered into a Compact which followed the format and was subject to the provisions of the 1922 Colorado River Compact. Article III apportioned to Arizona the consumptive use of 50,000 acre-feet of water annually and to the following States by the following percentages of the total quantity available for use each year by the Upper Basin under the Colorado River Compact and remaining after deduction of the use, not to exceed 50,000 acre-feet per annum made in Arizona:

Colorado	51.75 percent
New Mexico	11.25 percent
Utah	23.00 percent
Wyoming	14.00 percent

Article IV provides that in the event curtailment of use of water by the Upper Division States becomes necessary in order that the flow at Lee Ferry shall not be depleted below that required by Article III of the 1922, the extent of curtailment by each State shall be determined by the Commission (established at Article VIII) upon the application of stated principles. Article V established principles governing the application of the loss of water from storage in reservoirs.

Article VI provided that the Commission shall determine the quantity of the consumptive use of water by the inflow-outflow method in terms of manmade depletions of the virgin flow at Lee Ferry, unless a different method of determination is adopted by unanimous action.. This differs from the Lower Basin formula of "diversions less return flows" (see Senate Document No, 8, 81st Congress, 1st Sesstion, January 31, 1949).

Article VIII created an inter-State administrative agency known as the

"Upper Colorado River Commission" and enumerated its powers. The Commission is composed of one member from each of the above-named four States and one Commissioner named by the President of the United States.

**Water Supply Assumptions**

Table 1, Estimates of Wyoming's Colorado River Compact Water Supply, shows that the compact water supply varies from 1,043,000 acre-feet per year based on Article III(a) of the Colorado River Compact and the Upper Colorado River Basin Compact (an Upper Basin water supply of 7,500,000 acre-feet per year and the Mexican Water Treaty obligation is a national obligation not requiring the Upper Division States to deliver water to the Lower Division for that purpose), down to 728,000 acre-feet per year (based on the assumption that the Upper Division States would be required to deliver half of the Mexican Treaty obligation and the Upper Basin Long-Term Water Supply is 6,000,000 acre-feet per year).

Table 1  
ESTIMATES OF WYOMING'S COLORADO RIVER COMPACT WATER SUPPLY

A. Based upon Article III(a) of the Colorado River Compact and Article III of the Upper Colorado River Basin Compact:

Upper Basin Annual Supply	7,500,000 AF/yr
Arizona's Upper Basin Share	<u>50,000 AF/yr</u>
	7,450,000 AF/yr
 Wyoming's 14 percent share	 1,043,000 AF/yr

This estimate neglects salvage, and does not assume that any of the 1,500,000 AF/yr Mexican Water Treaty obligation would have to be delivered by the Upper Division States. Section 202 of Public Law 90-537, the Colorado River Basin Project Act, states that:

"The Congress declares that the satisfaction of the requirements of the Mexican Water Treaty from the Colorado River constitutes a national obligation which shall be the first obligation of any water augmentation project planned pursuant to section 201 of this Act and authorized by the Congress ..."

B. On February 2, 1989 the Acting Secretary of the Interior transmitted a copy of the Department of the Interior's "1988 Hydrologic Determination on Water Availability from Navajo Reservoir and the Upper Colorado River Basin in New Mexico" which officially revised the Secretary's estimate of the available Upper Basin water supply from 5,800,000 acre-feet per year upward to 6,000,000 acre-feet per year. The Upper Division States and the Upper Colorado River Commission have maintained that the Upper Basin yield is at least 6,300,000 acre-feet per year. Assuming that the 6,000,000 acre-feet per year figure is, through some judicial misadventure, determined to be the Upper Basin annual supply, and that through another of the same judicial misadventure the determination was made that the Upper Division States must supply half of the Mexican Water Treaty obligation of 1,500,000 acre-feet per year in addition to the water delivery mandated by Article III of the Colorado River Compact (75 million acre-feet for any period of ten consecutive years), then the "worst case" water supply for the Upper Basin, including Wyoming would be:

Upper Basin Annual Supply	6,000,000 AF/yr
Arizona's Upper Basin Share	<u>50,000 AF/yr</u>
	5,950,000 AF/yr
50% of Mexican Treaty obligation	<u>750,000 AF/yr</u>

5,200,000 AF/yr

Wyoming's 14 percent share, based on the 6.0 million acre-feet water supply, and assuming that the Upper Basin is not required to assist in meeting the Mexican Water Treaty obligation, is **833.000 AF/yr**

Wyoming's 14 percent share, based on the 6.0 million acre-feet water supply, and assuming that the Upper Basin is required to assist in meeting the Mexican Water Treaty obligation, is **728,000 AF/yr**

These estimates neglect salvage (reduction in channel losses which could be worth about 31,000 acre-feet per year in total).

It would be my recommendation that for purposes of the Green River water planning modeling efforts that you use 833,000 acre-feet per year as Wyoming's long-term available water supply for your planning purposes. This reflects a 6.0 MAF supply and that the Upper Division States are not required to deliver one-half of the Mexican Water Treaty water requirement. This recommendation is based on several reasons, including the fact that this water supply is the quantity used for the Upper Colorado River Commission's projected water depletion estimates. This is discussed in greater detail below.

#### **Apportionment under the Upper Colorado River Basin Compact**

Article III of the Compact reads as follows:

##### **Article III**

"(a) Subject to the provisions and limitations contained in the Colorado River Compact and in this compact, there is hereby apportioned from the upper Colorado River system in perpetuity to the states of Arizona, Colorado, New Mexico, Utah and Wyoming, respectively, the consumptive use of water as follows:

(1) To the state of Arizona the consumptive use of 50,000 acre-feet of water per annum.

(2) To the states of Colorado, New Mexico, Utah and Wyoming, respectively, the consumptive use per annum of the quantities resulting from the application of the following percentages of the total quantity of consumptive use per annum apportioned in perpetuity to and available for use each year by Upper Basin under the Colorado River Compact and remaining after the deduction of the use, not to exceed 50,000 acre-feet per annum, made in the state of Arizona.

State of Colorado, 51.75 per cent; State of New Mexico, 11.25 per cent; State of Utah, 23.00 per cent; State of Wyoming, 14.00 per cent.

(b) The apportionment made to the respective states by paragraph (a) of this Article is based upon, and shall be applied in conformity with, the following principles and each of them:

(1) The apportionment is of any and all man-made depletions;

(2) Beneficial use is the basis, the measure and the limit of the right to use;

(3) No state shall exceed its apportioned use in any water

year when the effect of such excess use, as determined by the commission, is to deprive another signatory State of its apportioned use during that water year; provided, that this subparagraph (b)(3) shall not be construed as:

(i) Altering the apportionment of use, or obligations to make deliveries as provided in Articles XI, XII, XIII or XIV of this Compact;

(ii) Purporting to apportion among the signatory States such uses of water as the upper basin may be entitled to under paragraphs (f) and (g) of Article III of the Colorado River Compact; or

(iii) Countenancing average uses by any signatory State in excess of its apportionment.

(4) The apportionment to each state includes all water necessary for the supply of any rights which now exist.

(c) No apportionment is hereby made, of such uses of water as the Upper Basin may be entitled to under paragraphs (f) and (g) of Article III of the Colorado River Compact.

(d) The apportionment made by this Article shall not be taken as any basis for the allocation among the signatory States of any benefits resulting from the generation of power."

In the "Report and Submission of the Upper Colorado River Basin Compact ... to the Governor and General Assembly, State of Colorado by the Commissioner for Colorado" dated December, 1948, Colorado's Commissioner, Clifford H. Stone, wrote the following description of the intent and meaning of Article III of the Upper Basin Compact. I believe that the Colorado River Commissioner's report is instructive in understanding the intentions of the Compact's negotiators.

"This is the apportionment Article. In considering it one must bear in mind two important facts, namely:

(1) The 1922 Compact does not apportion water but instead the use of water. This resulted from the decision by the makers of the original Compact that they should avoid any argument on the question as to whether the United States or the individual States own the unappropriated waters of the River. For this purpose a means of apportioning use rather than apportioning water was devised;

(2) While the 1922 Compact, by its paragraph III (a), apportions to the Upper Basin the beneficial consumptive use of 7,500,000 acre-feet of water annually, such use is subject to the availability of water. The States of the Upper Division are required by the 1922 Compact to maintain certain flows at Lee Ferry. The water available for use in the Upper Basin is that remaining after the Lee Ferry delivery requirements are satisfied. In view of the uncertainty as to the total amount of water which might be available for the Upper Basin the Compact Commission determined that so far as the States of the Upper Division are concerned the apportionment must be in terms of percents of the total amount of water apportioned to, and available for use in, the Upper Basin.

Accordingly an apportionment was made upon the following basis: Arizona which is not a State of the Upper Division, was granted the right to use a maximum of 50,000 acre-feet annually. The

use of the water apportioned to, and available for use in, the Upper Basin and remaining after the deduction of the use by Arizona of not to exceed 50,000 acre-feet annually, was apportioned on the following basis:

To Colorado 51.75%  
To New Mexico 11.25%  
To Utah 23%  
To Wyoming 14%

It is of interest to consider the analysis made by the Colorado Commissioner and his advisors before agreeing to the percentage stated for Colorado. A very careful study was made of the existing and potential uses in Colorado both within and without the natural Basin of the stream. On the assumption that 7,500,000 acre-feet of water will be available for use in the Upper Basin, the Colorado percentage is sufficient for a water supply to take care of all existing uses on both the Eastern and Western Slopes, for an expansion of uses on the Western Slope to an extent that would result in the consumption of double the amount of water now being consumed on the Western Slope, for taking care of all transmountain diversions constructed or under construction and all planned expansions thereof or additions thereto and for an estimated million acre-feet annually which may be made available for potential transmountain diversion projects. This appraisal was used in considering the apportionment question. It does not constitute a commitment on the manner in which Colorado shall eventually utilize its share of the water.

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It was necessary to specify certain principles upon which the apportionment was made. This is done in subparagraph (b) of Article III. It is recognized that the apportionment includes all man-made depletions, that beneficial use is the basis of the right to use, and that the allotment to each State includes all water necessary for the supplying of existing rights. Subparagraph (b) (3) recognizes certain limitations designed to protect each State in securing the use of the water allotted to it.

The Compact does not apportion any water which under the terms of the 1922 Compact falls within the category of surplus. It is specifically stated that the apportionment made by the Compact shall not be taken as any basis for the allocation of benefits resulting from the generation of power."

#### **Curtailement of Uses - "Compact Calls"**

Articles IV of the Compact address the matter of assuring the delivery of water to the Lower Division States as provided pursuant to the 1922 Colorado River Compact. Article IV of the Compact states the following:

#### **Article IV**

"In the event curtailement of use of water by the States of the Upper Division at any time shall become necessary in order that the flow at Lee Ferry shall not be depleted below that required by Article III of the Colorado River Compact, the extent of curtailement by each State of

the consumptive use of water apportioned to it by Article III of this Compact shall be in such quantities and at such times as shall be determined by the Commission upon the application of the following principles:

(a) The extent and times of curtailment shall be such as to assure full compliance with article III of the Colorado River Compact;

(b) If any state or States of the Upper Division, in the ten years immediately preceding the water year in which curtailment is necessary, shall have consumptively used more water than it was or they were, as the case may be, entitled to use under the apportionment made by Article III of this Compact, such State or States shall be required to supply at Lee Ferry a quantity of water equal to its, or the aggregate of their, overdraft or the proportionate part of such overdraft, as may be necessary to assure compliance with Article III of the Colorado River Compact, before demand is made on any other state of the Upper Division;

(c) Except as provided in subparagraph (ii) of this Article, the extent of curtailment by each State of the Upper Division of the consumptive use of water apportioned to it by Article III of this Compact shall be such as to result in the delivery at Lee Ferry of a quantity of water which bears the same relation to the total required curtailment of use by the States of the Upper Division as the consumptive use of Upper Colorado River system water which was made by each such State during the water year immediately preceding the year in which the curtailment becomes necessary bears to the total consumptive use of such water in the States of the Upper Division during the same water year; provided, that in determining such relation the uses of water under rights perfected prior to November 24, 1922, shall be excluded.

In the "Report and Submission of the Upper Colorado River Basin Compact ... to the Governor and General Assembly, State of Colorado by the Commissioner for Colorado" dated December, 1948, Colorado's Commissioner, Clifford H. Stone, wrote the following description of the intent and meaning of Article IV of the Upper Basin Compact. I believe that the Colorado River Commissioner's report is instructive in understanding the intentions of the Compact's negotiators.

"This Article relates to curtailment of use if necessary in order to maintain Lee Ferry flows. Under the 1922 Compact the States of the Upper Division may not deplete the Lee Ferry flow below specified quantities. To prevent a violation of that Compact it was necessary in the Upper Basin Compact to make provision for the curtailment of uses so as to prevent a depletion of the flow to an extent which would violate the 1922 Compact. Article IV gives to the administrative agency created by the Compact the authority to determine the extent of curtailment both as to quantity and time. In doing so, however, the Commission must follow certain stated principles. The curtailment must be such as to assure full compliance with the Colorado River Compact. If any State or States in the ten years preceding the year in which curtailment is necessary, has used more water than they were entitled to use under the apportionment made in Article III, then such State or States must deliver at Lee Ferry a quantity of water equal to the overdraft before demand is made on any other State for curtailment. Except for this requirement the extent of curtailment by each Upper Division State must be such as to deliver at Lee Ferry the quantity of water

which bears the same relation to a total curtailment as the consumptive use of water by that State in the preceding year bears to the total consumptive use in all of the States of the Upper Division during the same year. It is most important to note that in determining the last-mentioned relationship uses of water under rights perfected prior to November 24, 1922, are excluded. The value of this provision to Western Slope users should be recognized. A very high proportion of their uses was made under rights antedating 1922."

#### Article VI

Article VI of the Compact reads as follows:

"The Commission shall determine the quantity of the consumptive use of water, which is apportioned by Article III hereof, for the Upper Basin and for each State of the Upper Basin the inflow-outflow method in terms of man-made depletions of the virgin flow at Lee Ferry, unless the Commission, by unanimous action, shall adopt a different method of determination."

Commissioner Stone wrote the following in his report to the Governor and General Assembly of the State of Colorado with regard to Article VI of the Upper Compact:

"The purpose of this Article is to establish the method of measuring consumptive use of water. There is no purpose in making an apportionment of consumptive use unless the procedure for measurement is defined. There have been in the Colorado River Basin two conflicting theories as to the measurement of consumptive use. Without entering upon a technical discussion of the details, it is sufficient to say that under one these theories the use is measured by totaling the diversions from the river and subtracting therefrom the return flows. Under the second theory the quantity of consumptive use is determined by computing the extent to which the man-made uses have depleted the stream flows at designated points. The first theory is utterly unworkable in Colorado. On the Western Slope there are thousands of ditch diversions. To apply the principle of diversions less returns it would theoretically be necessary to install automatic measuring devices at the headgate of each ditch. By such procedure the diversions could be measured. The measuring of returns to the river from this multitude of individual diversions would present a complex problem for which no easy solution has ever been indicated. The situation in Colorado is comparable to that existing in other Upper Basin States.

The negotiators of the Upper Basin Compact also gave consideration to the intent of the makers of the 1922 Compact. It was concluded that such intent was to measure uses in terms of stream depletions at Lee Ferry so far as the Upper Basin is concerned.

After full consideration, it was determined that consumptive use should be measured 'by the inflow-outflow method in terms of man-made depletions of the virgin flow at Lee Ferry.' The 'inflow-outflow' method is an engineering procedure whereby the amount of water occurring in the Upper Basin by series (sic) of rim stations. The outflow is, of course, determined by the flow at Lee Ferry. The amount of consumptive use represents the change in the relationship between the index stations from that existing under virgin conditions and that existing at any particular time after the stream

has been depleted by man's activities.

'Man-made depletions' means the reduction in river flow caused by the activities of man. 'Virgin flow,' sometimes called 'reconstructed flow,' means the amount of water flowing in the river before any of it is put to use by man's activities.

The actual determination of the consumptive use by the procedure indicated is made a responsibility of the administrative agency. The Commissioners recognized that in the future some other or different method of measurement might become necessary; hence the Commission is given the right to adopt a different method of determination, but in taking such action the Commission must act unanimously."

#### **Article XI**

Article XI of the Upper Colorado River Basin Compact states:

"Subject to the provisions of this Compact, the consumptive use of the water of the Little Snake River and its tributaries is hereby apportioned between the States of Colorado and Wyoming in such quantities as shall result from the application of the following principles and procedures:

(a) Water Used Under Rights Existing Prior to the Signing of This Compact:

(1) Water diverted from any tributary of the Little Snake River or from the main stem of the Little Snake River above a point one hundred feet below the confluence of Savery Creek and the Little Snake River shall be administered without regard to rights covering the diversion of water from any downstream points.

(2) Water diverted from the main stem of the Little Snake River below a point one hundred feet below the confluence of Savery Creek and the Little Snake River shall be administered on the basis of an interstate priority schedule prepared by the commission in conformity with priority dates established by the laws of the respective States.

(b) Water Used Under Rights Initiated Subsequent to the Signing of This Compact:

(1) Direct flow diversions shall be so administered that, in time of shortage, the curtailment of use on each acre of land irrigated thereunder shall be as nearly equal as may be possible in both of the States.

(2) The storage of water by projects located in either State, whether of supplemental supply or of water used to irrigate land not irrigated at the date of the signing of this Compact, shall be so administered that in times of water shortage the curtailment of storage water available for each acre of land irrigated thereunder shall be as nearly equal as may be possible in both States.

(c) Water uses under the apportionment made by this Article shall be in accordance with the principle that beneficial use shall be the basis, measure and limit of the right to use.

(d) The States of Colorado and Wyoming each assent to diversions and storage of water in one State for use in the other State, subject to compliance with Article IX of this Compact.

(e) In the event of the importation of water to the Little Snake River Basin from any other river basin, the State making the importation shall have the exclusive use of such imported water unless by written agreement, made by the representatives of the States of Colorado and Wyoming on the commission, it is otherwise provided.

(f) Water use projects initiated after the signing of this Compact, to the greatest extent possible, shall permit the full use within the Basin in the most feasible manner of the waters of the Little Snake River and its tributaries, without regard to the state line; and, so far as is practicable, shall result in an equal division between the States of the use of water not used under rights existing prior to the signing of this Compact.

(g) All consumptive use of the waters of the Little Snake River and its tributaries shall be charged under the apportionment of Article III hereof to the State in which the use is made; provided, that consumptive use incident to the diversion, impounding or conveyance of water in one State for use in the other shall be charged to the latter State."

Referring once again to Commissioner Stone's report and submission of the Upper Colorado River Compact, the following was provided as the description of Article XI:

"This Article determines the rights of Colorado and Wyoming to the use of the waters of the Little Snake River which arises in Colorado and flows back and forth across the Colorado-Wyoming line nineteen times before finally joining the Yampa River in Colorado. The existing rights on the main stem below the confluence of Savery Creek and Little Snake are required to be administered on the basis of an interstate priority schedule. Rights initiated subsequent to the signing of the Compact, both direct flow and storage, are required to be so administered that in times of water shortage the curtailment of use in each State shall be as nearly equal as is possible. Future water use projects shall to the greatest extent possible result in an equal division between the two States of water not used under rights existing prior to the signing of this Compact.

Water uses along the Little Snake and along all other tributaries are individually treated by the Compact, are chargeable against the apportionment made in Article III to the State in which the consumptive use occurs."

Attached to this memorandum are copies of correspondence that addresses the Upper Colorado River Commission's consideration and development of the interstate priority schedule. With those materials is a memorandum prepared by the Wyoming State Engineer which responded to inquiries from the Water Development Commission concerning the administration of this article of the Compact. As with other administrative aspects of the Compact, their principles are set forth and in some ways the procedures are described, but actual water administration for compact purposes has not yet been required by the parties pursuant to these provisions.

**Projections of Future Water Depletions**

Table 2 presents the most-current estimated depletion projections for the State of Wyoming. This table is one of a series of tables that were updated by the Wyoming State Engineer's Office and were approved by the Upper Colorado River Commission at its meeting on December 15, 1999 in Las Vegas, Nevada. This table is the best that we have at this time and we are hopeful that the Water Plan for the Green River Basin, when completed, will be able to refine and better justify depletion projections within Wyoming's portion of the Green River Basin.

Table 2  
**Upper Colorado River Division States Depletion Projections Schedule (Wyoming)**  
(In Thousands of Acre-Feet of Water Consumption Per Year)

ITEM	YEAR							
	1991-1995	2000	2010	2020	2030	2040	2050	2060+
<b>CURRENT DEPLETIONS</b>								
Agricultural-Irrig & Stock	379.2	379.2	379.2	379.2	379.2	379.2	379.2	379.2
Municipal/Domestic	5.4	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Power/Industrial	41.7	44.0	45.0	45.0	45.0	45.0	45.0	45.0
Minerals	8.8	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Export	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2
Reservoir Evaporation	36.1	37.0	37.0	37.0	37.0	37.0	37.0	37.0
<b>TOTAL CURRENT DEPLETIONS</b>	<b>489.4</b>	<b>493.0</b>	<b>494.0</b>	<b>494.0</b>	<b>494.0</b>	<b>494.0</b>	<b>494.0</b>	<b>494.0</b>
<b>ANTICIPATED DEPLETIONS</b>								
Agricultural-Irrig & Stock	0.0	0.5	8.0	9.0	10.0	11.0	12.0	15.0
Municipal/Domestic (33% inbasin)	0.0	0.0	2.0	3.0	4.5	6.5	8.0	10.0
Power/Industrial	0.0	0.0	3.0	7.0	12.0	18.0	25.0	30.0
Minerals	0.0	3.0	7.0	10.0	12.0	18.0	21.0	25.0
Export (67% for Cheyenne)	0.0	0.0	2.0	4.0	7.0	11.0	15.0	20.0
Reservoir Evaporation	0.0	0.5	0.5	0.8	1.0	1.5	2.5	4.0
<b>TOTAL ANTICIPATED DEPLETIONS</b>	<b>0.0</b>	<b>4.0</b>	<b>22.5</b>	<b>33.8</b>	<b>46.5</b>	<b>66.0</b>	<b>83.5</b>	<b>104.0</b>
<b>POTENTIAL DEPLETIONS</b>								
Agricultural-Irrig & Stock	0.0	0.0	0.0	2.0	5.0	9.0	12.0	15.0
Municipal/Domestic	0.0	0.0	0.0	0.0	0.0	0.0	10.0	33.0
Power/Industrial	0.0	0.0	0.0	0.0	10.0	20.0	30.0	40.0
Minerals	0.0	0.0	0.0	0.0	5.0	10.0	36.0	48.0
Export	0.0	0.0	0.0	4.0	8.0	12.0	15.0	18.0
Reservoir Evaporation	0.0	0.0	0.0	1.0	2.5	4.0	6.0	8.0
<b>TOTAL POTENTIAL DEPLETIONS</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>7.0</b>	<b>30.5</b>	<b>55.0</b>	<b>109.0</b>	<b>162.0</b>
Summary of Depletions	489.4	497.0	516.5	534.8	571.0	615.0	686.5	760.0
Evap-Storage Units	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0
<b>TOTAL DEPLETIONS</b>	<b>562.4</b>	<b>570.0</b>	<b>589.5</b>	<b>607.8</b>	<b>644.0</b>	<b>688.0</b>	<b>759.5</b>	<b>833.0</b>
State Share of 6.0 Million Acre-Feet	833.0	833.0	833.0	833.0	833.0	833.0	833.0	833.0
Remaining Available	270.6	263.0	243.5	225.2	189.0	145.0	73.5	0.0
Percent of State Share Remaining	32.5%	31.6%	29.2%	27.0%	22.7%	17.4%	8.8%	0.0%

**River Administration and Compact Operations**

The Colorado River Basin Project Act of 1968 authorized the construction of the Central Arizona Project. It directed the Secretary to propose criteria for the coordinated long-range operations of Federal reservoirs, and provided that the criteria make provisions for the storage of water in storage units of the Colorado River Storage Project and releases of water from Lake Powell in a stated order of priority: (1) the Treaty obligation to Mexico, chargeable to the States of the Upper Division, if any exists; (2) The Upper Basin guarantee of 75 maf every 10 years to the Lower Basin; and (3) carryover storage to meet these obligations were to be given preference. Parity in storage between Lake Mead and Lake Powell was also provided. Following the adoption of the criteria, the Secretary is to report on the actual operation for the preceding compact water year and the project operation for the current year (Section 602).

The criteria were adopted by the Secretary on June 8, 1970 (discussed immediately below). It reaffirmed the rights of the Upper Basin to the consumptive use of water from the Colorado River System available to that Basin under the Compact and provided that such rights shall not be reduced or prejudiced by any use of such water in the Lower Basin. Further, that the Act shall not be construed to impair the duties and powers of the Upper Colorado River Commission (Section 603). It also defined terms such as "active storage" and "augmentation" (Section 606).

### Operating Criteria

Section 602(a) of the Colorado River Basin Project Act of September 30, 1968, 82 Stat. 885, directed the Secretary of the Interior to "propose criteria for the coordinated long-range operation of the reservoirs constructed and operated under the authority of the Colorado River Storage Project Act, the Boulder Canyon Project Act, and the Boulder Canyon Project Adjustment Act" and to receive comments from the States.

The need for the criteria was the concern of the Upper Basin States as to their ability to recapture from a new project in the Lower Basin (e.g. the Central Arizona Project, whose construction was authorized by the 1968 CRBPA) presently unused water apportioned to the Upper Basin when needed for their own development. As a result of negotiations the Basin Project Act contained a list of priorities to govern the storage of water in storage units of the Storage Project and releases of water from Lake Powell. The Act also provided that the Upper Basin's rights to the consumptive use of water apportioned to that Basin by the Colorado River Compact would not be prejudiced or reduced by any use thereof in the Lower Basin. In other words, storage in Lake Powell is the cornerstone of the Upper Basin's ability to deliver water to the Lower Basin to fulfill the requirements of Articles III(c) and (d) of the Compact and, at the same time, permit Upper Basin consumptive uses. Article III(c) deals with deliveries to Mexico and III(d) deals with deliveries of 75 maf to the Lower Basin each 10 years. The criteria were to be prepared and reviewed each year after an exchange of views with the States and affected parties.

The objective of the legislative requirements for the criteria was more efficient and reasonable river management. At the same time augmentation was emphasized in an effort to minimize the controversy over the Upper Basin's share of contribution to Mexico and whether the Gila River flows are accountable therefor. An example was the requirement that the first priority for the release of water from Lake Powell is to satisfy one-half of the deficiency in deliveries of water to Mexico, if any such deficiency exists and is chargeable to the States of the Upper Basin, but that the priority shall not apply in any year that the river is augmented sufficiently to satisfy the Treaty requirements and associated losses. Among other major issues involved

in the discussions over the criteria were: Lake Powell bank storage; estimates of Upper and Lower Basin depletions; the use and magnitude of a specific figure for releases from Lake Powell (e.g., 8.23 maf as the minimum annual release objective); continuation of the Filling Criteria; and the use of a rule curve to accumulate storage in the Upper Basin reservoirs.

On June 8, 1970, after evaluation of the comments of the Upper and Lower Basin States, Secretary Hickel adopted the Operating Criteria. A letter of June 9, 1970, from the Commissioner of Reclamation explained the rationale of the decisions on these comments. The Secretary concluded that the Filling Criteria would be continued, that energy needed to replace Hoover Dam deficiencies would be purchased, that the Upper Colorado River Basin Fund will be reimbursed pursuant to Section 502 of the Basin Project Act for monies used therefrom to purchase energy, except that the costs incurred in connection with impairment of capacity and energy resulting from the drawdown of Lake Mead below elevation 1123 feet incident to the attainment of minimum power pool in Lake Powell would not be repaid.

The criteria for coordinated long-range operation of Colorado River reservoirs, approved June 8, 1970, include the following provisions:

- The Secretary may modify them from time to time and will sponsor a formal review at least every 5 years with the States participation. The Secretary shall transmit to Congress and the Basin States Governors an annual report, starting January 1, 1972, and each January 1 thereafter, describing actual operations for the preceding compact water year and the projected plan of operation for the current year (Article I(1)).
- The plan of operation shall include a determination by the Secretary of the quantity of water considered necessary to be in storage as of September 30 of that year as required by Section 602(a) of Public Law 90-537 ("602(a) Storage"). The factors to be considered in arriving at that determination are listed; e.g., historic streamflow, the most critical periods of record, and probabilities of water supply, estimated storage depletions in the Upper Basin, including the effects of recurrence of critical periods of water supply, the report of the committee on probabilities and test studies dated October 30, 1967 and the necessity to assure that Upper Basin consumptive uses not be impaired because of failure to store sufficient water to assure delivery under Section 602(A)(1) and (2), Public Law 90-537 (Article II(1)).
- If, in the plan of operation, either
  - (a) the Upper Basin storage reservoirs active storage forecast for September 30 of the current year is less than the quantity of Section 602(a) storage determined for that date, or
  - (b) the Lake Powell active storage forecast for that date is less than the Lake Mead active storage forecast for that date, the objective shall be to maintain a minimum release from Lake Powell of 8.23 maf for that year (Article II(2)).
- Importantly, if the Upper Basin storage reservoirs active storage forecast for September 30 of the current year is less than the quantity of Section 602(a) storage, water shall be released annually from Lake Powell at a rate greater than 8.23 maf to accomplish the following objectives:
  - (a) To the extent it can be reasonably applied in the Lower Division States, but no such release shall be made when the active storage in Lake Powell is less than the active storage in Lake Mead;
  - (b) To maintain, as nearly as practicable, active storage in Lake Mead equal to the active storage in Lake Powell; and
  - (c) To avoid anticipated spills from Lake Powell (Article II(3)).

- In the application of Article II(3) the objective will be to pass the releases through Glen Canyon Powerplant as soon as practicable, utilizing the available capability of the powerplant, in order to equalize the active storage in Lake Powell and Lake Mead (Article II(4)).
- Releases from Lake Powell pursuant to the criteria shall not prejudice either Basin's interests with respect to required deliveries at Lee Ferry pursuant to the Compact (Article II(5)).
- Lake Mead is to be operated to meet Mexican Treaty obligations, reasonable consumptive use requirements of mainstream users in the Lower Basin, net river and net reservoir losses, and regulatory waste (Article III(1)).
- Until Central Arizona Project water deliveries are made, Lower Basin reasonable consumptive use requirements will be met (Article III(2)). Thereafter, the consumptive use requirements will be met in light of the following situations: normal (7.5 maf); surplus (i.e., quantities greater than normal); and shortage (i.e., insufficient water to satisfy 7.5 maf annual consumptive use requirements) (Article III(5)). The criteria specified the relevant factors to consider in connection with "surplus" and "shortages." Definitions of these terms are contained in Article IV.

In the actual operations under the Operating Criteria the annual reports have avoided the determination of the numerical value for Section 602(a) storage by stating that "the accumulation of 602(a) storage is not the criteria governing the release of water during the current year."

In 1975 the first formal 5-year review of the criteria was made, but after receipt of comments, the Secretary announced their continuation without change. Subsequent reviews of the Criteria in 1980, 1985, 1990 and 1995 have also resulted in no changes being made to the Operating Criteria.

An additional synopsis of the Criteria for coordinated long-range operation of Colorado River Reservoirs pursuant to the Colorado River Basin Project Act of September 30, 1968 (Public Law 90-537) is provided below:

Criteria promulgated pursuant to Section 602 of P.L. 90-537

They control operation of the upper basin reservoirs built under the 1956 CRSP Act and the 1928 Boulder Canyon Project Act.

Administered consistent with the applicable Federal law, Mexican Water Treaty, interstate compacts and decrees relating to the use of the Colorado River.

Secretary of the Interior may modify in accordance with Sec. 602 of P.L. 90-537; with formal review at least every 5 years and participation of State representatives as each Governor may designate and such other parties as the Secretary may deem appropriate.

#### Annual Report

Each January 1st report by Secretary due on actual operation under the adopted criteria for the preceding year and the projected plan of operation for the current year due to the Congress and the Governors of the Seven Basin States.

Plan of Operation shall include such detailed rules and quantities as may

be necessary and consistent with these criteria; and ... shall reflect appropriate consideration for the uses of the reservoirs for all purposes, including:

- flood control
- river regulation
- beneficial consumptive uses
- power production
- water quality control
- fish and wildlife enhancement
- and other environmental factors

Projected plan (AOP) may be revised to reflect current hydrologic conditions; Congress and Basin States Governors shall be advised of any changes by June each year.

#### Operation of Upper Basin Reservoirs

The AOP shall include a determination of the quantity required to be in storage as required by Section 602(a) of P.L. 90-537 [This is "602(a) storage"]. Determined by Secretary after considering:

- Historical streamflows;
- The most critical period of record
- Estimated future depletions in the upper basin, including the effects of recurrence of critical periods of water supply;
- the necessity to assure that upper basin consumptive uses are not impaired by not storing sufficient water to assure deliveries under Section 602(a) of P.L. 90-537.

IF, Upper Basin Storage storage forecast for September 30th is less than 602(a) storage amount determined necessary by the Secretary OR

Sept 30 active storage forecast is less than the Lake Mead active storage forecast for that date, THEN the objective shall be to maintain a minimum release from Lake Powell of 8.23 million acre-feet for that year.

If Sept. 30 forecast is for more storage than required for 602(a) determination, then water may be released at a rate greater than 8.23 million acre-feet to the extent necessary to accomplish any or all of the following objectives:

- For Article III(e) Compact uses [reasonable domestic and agricultural purposes]

- To maintain storage in Lake Mead equal to the Lake Powell storage, and to avoid Lake Powell "spills."

#### Operation of Lake Mead

Water released from Lake Powell plus the tributary inflows shall be regulated in Lake Mead and either pumped from Mead or released to the Colorado River to meet requirements as follows:

- Mexican Treaty obligations, then reasonable consumptive use requirements of mainstream users in the Lower Basin

- Net river losses, then reservoir losses, then regulatory wastes

The Secretary of Interior directed to determine each year whether water

supply is "normal", "surplus" or "shortage." If "normal" supply exists, then the annual pumping and release from Lake Mead will be sufficient to satisfy 7,500,000 acre-feet of annual consumptive use in accordance with the United States Supreme Court Decree in Arizona v. California (1964).

### **Further Discussion and Conclusions**

I hope that the above is useful in describing the provisions of the Upper Colorado River Basin Compact that are applicable to our discussion in Green River and in answering the questions that we discussed. Relative to the these subjects, I would add in closing that the administrative provisions of Article IV of the Upper Colorado River Compact have not been exercised for the reason that the situation has not arisen requiring (and we certainly hope it doesn't) "curtailment of use of water by the States of the Upper Division at any time" for the reason "that the flow at Lee Ferry shall not be depleted below that required by Article III of the Colorado River Compact." As detailed above, Article VI provides that "the extent of curtailment by each State of the consumptive use of water apportioned to it by Article III of this Compact shall be in such quantities and at such times as shall be determined by the Commission upon the application of the [specific, enumerated] ... principles ..." While those principles are set forth in some detail, the fact remains that the Commission has not had, to my knowledge, much dialogue over the years about the application of the specified principles. The principles are clearly stated but the detailed accounting that would be required to adequately or accurately assess the "extent of curtailment" necessary and the "quantity of water which bears the relation to the total required curtailment of use by the States of the Upper Division as the consumptive use of Upper Colorado River System water which was made by each such State during the water year immediately preceding the year in which the curtailment becomes necessary bears to the total consumptive use of such water in the States of the Upper Division during the same water year; provided, that in determining such relation the uses of water under rights perfected prior to November 24, 1922, shall be excluded." It seems apparent that additional sophistication in accounting and considerable instrumentation, record-keeping, accounting, etc. would be required to estimate, compute and measure the quantities of water use that would have to be curtailed.

Similarly, the Commission's discussion of the inflow-outflow method of determining consumptive use is not a subject that has been discussed to any extent during my 15 years of attending the Commission meetings and it is in an area that could benefit from some addition research efforts. Please consider if or how the State Engineer's Office of the Upper Colorado River Commission should assist in regards to this matter as well.

In addition, there are Compact interpretation questions concerning the computation of the Compact delivery, e.g. the quantity of water delivered during each ten year consecutive running period - that is, the Mexican Treaty obligation question - does the Upper Basin actually need to deliver 82,500,000 or 75 million in each 10 year period. These interpretation matters, while critically important, are most likely not "ripe" as either policy or judicial questions at this time. Nevertheless, they most likely do need to be explained or commented on in Wyoming's water plan and we obviously need to describe the Upper Basin's position about when a "deficiency" exists (as used in Article III (c)<sup>1</sup> of the Colorado River Compact. As I don't have my materials at hand relative to setting forth that explanation, please allow me to address this matter, and others that you may identify or that arise during our subsequent conversations, in additional memoranda. I look forward to discussing these subjects with you and close with the request that you please

don't hesitate to contact me or State Engineer Jeff Fassett at any time.

Attachments (sent via U.S. Postal Service on 1/18/2000)

cc: Jeff Fassett

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<sup>1</sup> (c) If, as a matter of international comity, the United States of America shall hereafter recognize in the United States of Mexico any right to the use of any waters of the Colorado River system, such waters shall be supplied first from the waters which are surplus over and above the aggregate of the quantities specified in paragraphs (a) and (b); and if such surplus shall prove insufficient for this purpose, then the burden of such deficiency shall be equally borne by the upper basin and the lower basin, and whenever necessary the States of the upper division shall deliver at Lee Ferry water to supply one-half of the deficiency so recognized in addition to that provided in paragraph (d).

January 31, 2000

**MEMORANDUM**

TO: Meg Franz, Senior Engineer, Boyle Engineering Corporation

FROM: John W. Shields, Interstate Streams Engineer, State Engineer's Office

SUBJECT: Upper Colorado River Basin Compact Delivery Obligations of the Upper Division States Relative to One-Half of the Mexican Water Treaty

In follow-up to my memo on January 11th, the following addresses the matter of interpretation of Article III(c) of the Colorado River Compact and whether and when the Upper Division States would have an obligation to deliver one-half of the Mexican Water Treaty requirement of 1,500,000 acre-feet per annum.

In his testimony to the Subcommittee on Energy Research and Water Resources of the Senate Committee on Interior and Insular Affairs dated June 12, 1975, entitled: "State on the Operation of the San Juan-Chama Project, Colorado New Mexico and the Related Impacts in the San Juan River Basin," former New Mexico State Engineer Steven E. Reynolds addressed the matter of when do the Upper Division States have an obligation to release water to meet the water delivery requirement of the Mexican Water Treaty. This is the most thorough description and rationale on this subject of which I am aware, and sets forth the Upper Division States' arguments better than any other description that I have seen. In a later discussion of the subject matter of this memo, Mr. Reynolds made reference to the subject testimony and provided copies of it to his Upper Division State colleagues. I would like to quote from that statement in the following as I believe it sets forth in a clear and cogent manner the argument that most clearly reflects the Upper Colorado River Commission's positions with regard to whether, and when, the Upper Division States ultimately have to deliver one-half of the Mexican Water Treaty requirement.

## "Colorado River Compacts

Mr. Chairman, it is my understanding that the committee is interested in water rights for the San Juan-Chama Project and the question of the availability of water in the San Juan Basin to meet anticipated future demands. An adequate treatment of those subjects, requires, of course, some discussion of New Mexico's entitlement under the Colorado River Compacts.

Article III(a) of the Colorado River Compact of 1922 apportioned from the Colorado River system in perpetuity to the Basin and to the Lower Basin respectively, the exclusive beneficial consumptive use of 7.5 million acre-feet (maf) of water per annum. Article III(b) gives the Lower Basin in addition to this apportionment the right to increase its beneficial consumptive use of the waters of the Colorado River system by 1 maf per annum.

It is important to note that Article II(a) defines the term 'Colorado River system' as 'that portion of the Colorado River and its tributaries within the United States of America' (Emphasis supplied). Thus, uses from the main stream or any of its tributaries are chargeable against the apportionments made to the two Basins.

Article III(d) of the 1922 Compact provides that the states of the Upper Division will not cause the flow of the river at Lee Ferry, a point on the main stream about 30 miles below the Utah-Arizona state line, to be depleted below an aggregate of 75 maf for any period of ten consecutive years reckoned in continuing progressive series (Emphasis supplied). Attention is invited to the proposition that the injunction of paragraph (d) is not applicable to the State of Arizona in its capacity as a state of the Upper Basin. Colorado, New Mexico, Utah and Wyoming are by definition the states of the Upper Division. It can be inferred that the states of the Upper Division have met their III(d) obligation even though Arizona's use of 50,000 acre-feet in the Upper Basin might cause the flow of the river at Lee Ferry to be depleted below an aggregate of 75 maf for any period of ten consecutive years. To be conservative, the assessment of water supply given below assumes that the flow of the river at Lee Ferry, after Arizona has taken its Upper Basin entitlement, is not depleted below that aggregate.

Article III(c) of the 1922 Compact was prospective; it provided that if the United States should recognize in Mexico any right to the use of the waters of the Colorado River system, the waters would be supplied from waters over and above the aggregate of the quantities apportioned to the Upper Basin and to the Lower Basin by Article III(a) and Article III(b). Article III(c) further provides that if this surplus provides insufficient, then the burden of the deficiency will be equally borne by the Upper Basin and the Lower Basin, and the states of the Upper Division will deliver at Lee Ferry water to supply one-half of the deficiency in addition to the amount required to be delivered by the states of the Upper Division under Article III(d). It is interesting to note that the state of Arizona in its capacity as an Upper Basin state has no obligation with respect to the 1944 Mexican Treaty or the Article III(d) delivery requirement.

The information given in the attach Table 1 was derived from

three authoritative sources. The data demonstrates that with the deliver at Lee Ferry required by Article III(d) of the Compact, the water supply in the Lower Basin is more than adequate to supply the 8.5 maf of beneficial consumptive use apportioned to the Lower Basin by Article III of the Compact and the 1.5 maf required for delivery to Mexico in accordance with the Mexican Treaty of 1944.

Attention is invited to the fact that according to the sources cited estimates of the water supply available in the Lower Basin for beneficial consumptive use and delivery to Mexico vary from 10.680 maf annually to 10.125 maf annually. It appears that the greatest difference among authorities arise out of the potential for reduction of channel losses, the potential for ground water recovery in the Yuma area, and the safe yield of the Gila River for beneficial uses.

Attention is also invited to the fact that Table 1 reflects no reservoir evaporation chargeable to deliveries to meet the Treaty obligation. A necessary incident of the flow regulation needed to make the Upper Division states Article III(d) delivery is virtually all the regulation needed to make the Treaty deliveries, and the associated reservoir evaporation is at the expense of the Upper Division states. Little, if any, reregulation of the Upper Basin release is needed in the Lower Basin to make the Treaty obligation.

While the data of Table 1 indicate that an estimate of 10 maf annually available in the Lower Basin for beneficial consumptive use and delivery to Mexico is conservative, it can be demonstrated that even if the evaluation of the supply available in the Lower Basin were to be reduced to as little as 9 maf annually, it still would not be necessary for the Upper Division to deliver more than an average of 7.5 maf annually at Lee Ferry.

Assume for this discussion that the average virgin flow (i.e., the flow as it would be if undepleted by beneficial consumptive use) of the Colorado River at Lee Ferry is 14 maf annually. Under this assumption the Upper Division could deplete the Lee Ferry flow by 6.5 maf annually and still deliver an average of 7.5 maf annually, or 75 maf in each period of ten years. With an average delivery of 7.5 maf, only 1.5 maf annually would need to be produced by the Lower Basin of the Colorado River system to provide a total of 9 maf annually for Lower Basin beneficial consumptive uses and delivery to Mexico. Thus, the total available for beneficial consumptive use in the seven Colorado River states and for delivery to Mexico would be 15.5 maf annually ( $6.5 + 9.0 = 15.5$ ).

Article III(c) of the Compact provides that the waters to be delivered to Mexico shall be supplied first from the waters which are surplus over and above the aggregate of 16 maf apportioned by paragraphs (a) and (b). In the example given the surplus would be a negative quantity:  $-0.5$  maf ( $15.5 - 16 = -0.5$ ). Article III(c) provides further that if the surplus shall prove insufficient for the delivery to Mexico, then the burden of the deficiency shall be borne equally by the Upper Basin and the Lower Basin, and whenever necessary the states of the Upper Division shall deliver at Lee Ferry water to supply one-half of the deficiency in addition to the Lee Ferry delivery required by paragraph (d). The deficiency is equal to the Treaty obligation of 1.5 maf annually less the surplus; in the example given the deficiency would amount to 2 maf annually

(1.5 - (-0.5) = 2.0). With this deficiency borne equally, the Upper Basin would be entitled to use only 6.5 maf of the 7.5 maf apportioned to it by Article III(a) and the Lower Basin would be entitled to use only 7.5 maf of the 8.5 maf apportioned to it by Article III(a) and (b). Of the 9 maf available in the Lower Basin from the Lee Ferry delivery and the production of Lower Basin tributaries there would remain 1.5 maf for delivery to Mexico; it would not be necessary for the Upper Basin to meet any part of the Treaty obligations by deliveries in excess of 7.5 maf annually at Lee Ferry.

This proposition can be stated more succinctly. The deficiency for the Lower Basin III(a) and III(b) apportionments must be equal to the deficiency for the Upper Basin's III(a) apportionment before demand can be made on the states of the Upper Division for water for Mexico."

I look forward to further discussion of these subjects with you and close with the request that you please don't hesitate to contact me or State Engineer Jeff Fassett at any time.

Attachment (Table 1 reference in Reynolds' testimony cited herein)

cc: Jeff Fassett

Table 1  
 COLORADO RIVER  
 LOWER BASIN WATER SUPPLY  
 (million ac. ft. per year)

	a USBR	b Type I Study	c Ariz. v Calif.
Lee Ferry delivery	7.500	7.500	7.500
Net gain - Lee Ferry to Lake Mead	0.880	1.320 e	0.950
Channel losses after salvage	-0.380	-0.380	-0.300
Regulation losses	-0.060	-0.005 f	-0.075
Bill Williams River	0.050	---	0.075 g
Groundwater recovery (Yuma area)	0.220	---	---
Subtotal mainstem	8.210	8.425	8.150
Gila River System (safe yield)	2.300 h	1.700	1.830 i
Other tributary uses	0.170	---	0.155 i
Subtotal tributaries	2.470	1.700	1.985
Total	10.680	10.125	10.135
Mexican Treaty Obligation	-1.500	-1.500	-1.500
Available for beneficial consumptive use	9.180	8.625	8.635

Reservoir evaporation

Lake Mead j	0.600
Mainstem below Lake Mead a	0.370
Tributaries b	0.230
	1.200

- a. Central Arizona Project Hearing, Senate Subcommittee, May 2-5, 1967  
 b. Lower Colorado Region Comprehensive Framework Study, June 1971 (Appendix V)  
 c. California Exhibit 5572-A (Erickson study) Ariz. v Calif., et al.  
 d. 1922 Compact Article III(d) requirement.  
 e. Average annual undepleted tributary inflow below Lee Ferry exclusive of the Gila.  
 f. Not computed in Type I Study; based on "Annual Report, 1975 Projected Operation (of the Colorado River Basin)" USBR.  
 g. Useable inflow from Bill Williams and miscellaneous tributaries.  
 h. Pacific Southwest Water Plan, Supplemental Information Report C.A.P. USBR, Jan. 1964  
 i. California Exhibit 2217 Ariz. v Calif., et al.  
 j. California Exhibit 5572-A (Riter Study).