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No. 105, ORIGINAL

In The

SUPREME COURT OF THE UNITED STATES
October Term, 1994

STATE OF KANSAS,
Plaintiff,

v.

STATE OF COLORADO,
Defendant,

and

UNITED STATES OF AMERICA,
Defendant-Intervenor.

KANSAS' EXCEPTIONS TO THE 1994 REPORT OF THE SPECIAL MASTER AND BRIEF IN SUPPORT OF EXCEPTIONS

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November 17, 1994

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KANSAS' EXCEPTIONS TO THE 1994 REPORT OF THE SPECIAL MASTER

The State of Kansas takes exception to the following recommendations in the Special Master's 1994 Report:

1. That the Court grant Colorado's Motion to Dismiss Kansas' Trinidad Reservoir Claim;
2. That the Court reject Kansas' claim that Colorado's Winter Water Storage Program has violated the Arkansas River Compact; and
3. That the Court reject Kansas' method for determining the usability of depletions of stateline flows pursuant to Article IV-D of the Arkansas River Compact.

Respectfully submitted,

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KANSAS' BRIEF IN SUPPORT OF EXCEPTIONS

QUESTIONS PRESENTED

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1. Did Colorado violate the Arkansas River Compact by refusing to abide by the Trinidad Reservoir Operating Principles adopted by the Arkansas River Compact Administration?

2. Did the Special Master err in rejecting Kansas' claim that Colorado's Winter Water Storage Program has violated the Arkansas River Compact:

   (a) Because he placed the risk of uncertainty resulting from a lack of Colorado data on Kansas; or

   (b) Because he relied on a basis as to which the record was admittedly incomplete?

3. Did the Special Master err under Compact Article IV-D when he chose a long-term averaging method for determining usability and rejected Kansas' daily method?

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JURISDICTION

The State of Kansas invoked the original jurisdiction of the Court under Article III, Section 2, Clause 2 of the United States Constitution and the Judiciary Act, 28 U.S.C. § 1251(a) (1988) on December 16, 1985. Leave to file a bill of complaint was granted by the Court on March 24, 1986.

CONSTITUTIONAL PROVISIONS, STATUTES AND REGULATIONS INVOLVED

This case involves:

1. Article III, Section 2, Clause 2 of the United States Constitution which provides in pertinent part as follows:

> In all Cases affecting Ambassadors, other public Ministers and Consuls, and those in which a State shall be a Party, the supreme Court shall have original Jurisdiction.

2. 28 U.S.C. § 1251(a) (1988) which provides as follows:

> § 1251. Original jurisdiction
> (a) The Supreme Court shall have original and exclusive jurisdiction of all controversies between two or more States.

3. The Arkansas River Compact, 63 Stat. 145 (1949) ("Compact") which is reprinted as Exhibit 1 in the Appendix ("App.") to the Master's 1994 Report ("Rep.") and particularly Articles II, IV-D and VIII-A & -B thereof. Article II provides as follows:

> The provisions of this Compact are based on (1) the physical and other conditions peculiar to the Arkansas River and its natural drainage basin, and the nature and location of irrigation and other developments and facilities in connection therewith; (2) the opinion of the

United States Supreme Court entered December 6, 1943, in the case of *Colorado v. Kansas* (320 U.S. 383) concerning the relative rights of the respective States in and to the use of waters of the Arkansas River; and (3) the experience derived under various interim executive agreements between the two States apportioning the waters released from the John Martin Reservoir as operated by the Corps of Engineers. Rep., App., Ex. 1, at App. 2.

Article IV-D provides as follows:

D. This Compact is not intended to impede or prevent future beneficial development of the Arkansas River basin in Colorado and Kansas by Federal or State agencies, by private enterprise, or by combinations thereof, which may involve construction of dams, reservoir, and other works for the purposes of water utilization and control, as well as the improved or prolonged functioning of existing works: Provided, that the waters of the Arkansas River, as defined in Article III, shall not be materially depleted in usable quantity or availability for use to the water users in Colorado and Kansas under this Compact by such future development or construction. *Id.*, at App. 5.

Articles VIII-A & -B provide as follows:

A. To administer the provisions of this Compact there is hereby created an interstate agency to be known as the Arkansas River Compact Administration herein designated as "The Administration."

B. The Administration shall have power to:

(1) Adopt, amend and revoke by-laws, rules and regulations consistent with the provisions of this Compact;

(2) Prescribe procedures for the administration of this Compact: Provided, that where such procedures involve the operations of John Martin Reservoir Project they shall be subject to the approval of the District Engineer in charge of said Project;

(3) Perform all functions required to implement this Compact and to do all things necessary, proper or convenient in the performance of its duties. *Id.*, at App. 11.

4. Trinidad Dam and Reservoir Project Operating Principles and Minutes showing adoption by the Arkansas River Compact Administration on June 6, 1967, which are included in the Appendix to this Brief.

STATEMENT OF THE CASE

This is an action by the State of Kansas to enforce the Arkansas River Compact approved by the legislatures of Kansas and Colorado and by Congress in 1949. After trial, the Master found that increased well pumping in Colorado, Kansas' largest claim, constituted a violation of the Compact, but he ruled against Kansas on several important points.

I. Physical Features.

The Arkansas River rises in the Rocky Mountains near Leadville, Colorado, and flows generally southerly and then easterly through the city of Pueblo, Colorado. From Pueblo it continues eastward across the plains to the Colorado-Kansas state line. After crossing the state line, the river flows eastward to Garden City, Kansas, and through the states of Kansas, Oklahoma and Arkansas, ultimately entering the Mississippi River southeast of Little Rock, Arkansas.

The portion of the river at issue extends from the river's headwaters to Garden City, Kansas. *See* Rep., vol. I, at 35-40. The primary depletions of water in this reach are caused by the irrigation of crops. *See id.* In the portion of the Arkansas River between Pueblo and the state line, the water is applied to some 320,000 acres of irrigated land through diversion and rediversion of surface water and withdrawals from some 2,500 wells along the river. Rep., vol. II, at 203; Pl. Ex. 30, Table 1 (R. vol. 21, at 117, vol. 22, at 21, 30), Pl. App., Item 1.[1]

The three major reservoirs involved in this litigation are (1) John Martin Reservoir, about 58 miles upstream of the state line in Colorado; (2)Pueblo Reservoir at Pueblo, about 130 miles above John Martin Reservoir; and (3) Trinidad Reservoir at Trinidad, Colorado, somewhat more than 160 miles above John Martin Reservoir on the Purgatoire River, a major tributary of the Arkansas River. *See*, *e.g.*, Rep., vol. I, Map in pocket.

II. The Compact.

In the first half of the twentieth century, Kansas twice petitioned this Court, unsuccessfully, to establish an equitable apportionment of the flows of the Arkansas River and to obtain an injunction against further depletions in Colorado. *See Kansas v. Colorado*, 206 U.S. 46 (1907), and *Colorado v. Kansas*, 320 U.S. 383 (1943). In 1943 the Court recommended that the states resolve their differences by compact under Article I, Section 10, Clause 3 of the Constitution. *Colorado v. Kansas*, 320 U.S. at 392.

In response to this recommendation and in recognition that the states could benefit from the construction of John Martin Res-

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[1] The pages in the record at which an exhibit appears, at which it was offered in evidence, and at which it was ruled on by the Master will be given in parentheses. *See* Sup. Ct. Rule 24.5. "R" refers to the trial transcript of proceedings.

ervoir by the U.S. Army Corps of Engineers, the states negotiated a compact, equitably apportioning the waters of the Arkansas River.[2] *See* Arkansas River Compact, Arts. I, II (Rep., App., Ex. 1, at App. 1-2). The states reached agreement on December 14, 1948, *id.* at App. 16; the legislatures of Colorado and Kansas approved the Compact shortly thereafter; and Congress approved the Compact on May 31, 1949, Act of May 31, 1949, 63 Stat. 145.

The Compact consists of nine articles. In addition to the statements of purpose and basis (Arts. I & II), the Compact includes provisions regarding: Definitions (Art. III); limitations on the scope of the Compact, John Martin Reservoir generally and prohibition of material depletions of the river in usable quantity or availability (Art. IV); operating procedures for John Martin Reservoir (Art. V); jurisdiction (Art. VI); miscellaneous subjects (Art. VII); creation, powers and duties of the Arkansas River Compact Administration ("Compact Administration") (Art. VIII); and sovereignty of the United States and amendment of the Compact (Art. IX).

One of the Compact negotiators' purposes was to maintain the status quo. Rep., vol. I, at 99-102; Jt. Ex. 4, at 12-54 to -55 (R. vol. 5, at 53, 83, 86), Pl. App., Item 10; Jt. Ex. 3, at 13-100 (R. vol. 5, at 53, 83, 86), Pl. App., Item 9; Pl. Ex. 129, vol. II, at 387 (R. vol. 2, at 29, R. vol. 9, at 84, Admitted by written order of 11/16/93), Pl. App., Item 2. The uses already established in Colorado and Kansas were to be preserved but not enlarged, and the benefits of John Martin Reservoir were to be equitably apportioned. These purposes appear in Articles I-B and IV-D.

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[2] "Waters of the Arkansas River" means the waters originating in the natural drainage basin of the Arkansas River, including its tributaries, upstream from the state line, and excluding waters brought into the Arkansas River Basin from other river basins. Compact, Art. III-B, Rep., App., Ex. 1, at App. 2-3.

III. Colorado's Violations of the Compact.

After the Compact was adopted, Colorado undertook three developments which led to Kansas' claims that Colorado has violated the Arkansas River Compact:

First, Colorado permitted the installation of some 1,500 wells along the river tapping the shallow alluvial aquifer which is in direct hydraulic connection with the river. *See*, *e.g.*, Pl. Ex. 30, Table 1 (R. vol. 21, at 117, vol. 22, at 21, 30), Pl. App., Item 1; Rep., vol. I, at 113-17. In addition, Colorado allowed increased withdrawals from pre-Compact wells over and above the amounts that had been pumped prior to the Compact. R. vol. 82, at 139, Pl. App., Item 23. Although Colorado was one of the original prior appropriation doctrine states with respect to surface water,[3] it has never effectively regulated the wells in the Arkansas River Valley under the prior appropriation system. R. vol. 18, at 46, Pl. App., Item 20; Rep., vol. I, at 139. If wells had been regulated, most would not have been allowed to pump because they were generally later in priority compared to Colorado surface water rights. In fact, most were installed after the adoption of the Compact. R. vol. 15, at 132-34, Pl. App., Item 19; R. vol. 116, at 69; Pl. App., Item 27.

Second, Colorado sought federal funding for the Trinidad Dam and Reservoir Project, which had been authorized by Congress in 1958, Act of July 3, 1958; Jt. Ex. 35, at 309 (R. vol. 111, at 5, 6), Pl. App., Item 15. In order to obtain the concurrence of Kansas, Colorado agreed to Kansas' demand that the Compact Administration adopt a set of Operating Principles for Trinidad Dam and Reservoir Project ("Operating Principles") (Jt. Ex. 19,

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[3] The "Colorado Doctrine," indeed, was another name for the pure prior appropriation law first enunciated in *Coffin v. Left Hand Ditch Co.*, 6 Colo. 443 (1882); *see* Frank J. Trelease, *Water Law* 10-13, 29 (2d ed. 1974). This is the "first-in-time, first-in-right" legal doctrine governing the allocation of water in most Western states in which water rights are established by application to beneficial use and not by ownership of riparian lands.

June 6, 1967 minutes (R. vol. 17, at 87, 89)), Pl. App., Item 12. The principles had been developed by the U.S. Bureau of Reclamation based on hydrologic studies performed by the Bureau. Rep., vol. III, at 388-89. Once the Compact Administration adopted the Operating Principles, funds were appropriated and the project was built and became operational in 1979. *Id.*, at 395-96. However, as the Master correctly assumed in his report, Colorado violated the Operating Principles within a year after the project began to operate, by storing water that should have flowed downstream to other Colorado and Kansas irrigators. *See* Jt. Ex. 18-32, at 47-48 (R. vol. 20, at 100, vol. 21, at 34, 36), Pl. App. No. 11. The Bureau of Reclamation analyzed the reservoir operations and concluded that what Colorado had done from 1979 through 1984 was "a departure from the intent of the Operating Principles." Jt. Ex. 23, at 55 (R. vol. 17, at 69, R. vol. 18, at 21, 22), Pl. App., Item 13.

Third, in 1976, Colorado initiated the Winter Water Storage Program (WWSP). Rep., vol. II, at 309. The program consists of storing water in Pueblo Reservoir and other off stream reservoirs—water which before 1976 had been diverted onto the fields in Colorado for winter irrigation—and later releasing the stored water to irrigate crops during the summer months. *Id.*, at 308-11.

IV. Procedural History.

After the Court granted Kansas' Motion for Leave to File a Bill of Complaint, Colorado filed its Answer and Counterclaim, denying the allegations of Compact violations and asserting several defenses. Colorado's Counterclaim essentially made two claims: (1) that Kansas had stored water released from John Martin Reservoir in Lake McKinney Reservoir in Kansas in violation of the Compact; and (2) that increased post-Compact pumping in Kansas had depleted the surface water supply in Kansas and had caused Kansas users to make additional demands for releases of water stored in John Martin Reservoir in Colorado, to the detriment of Colorado users. *See* Rep., App., Ex. 3. The United

States intervened and filed an Answer relating to Kansas' Trinidad Reservoir and WWSP claims. *See id.*, at Ex. 4.

Prior to trial, the Master bifurcated the case into a liability phase and a remedies phase. *Id.*, at Ex. 6. Trial before the Master on the liability phase concluded on December 16, 1992. The Master submitted his Report to the Court at the end of July 1994. The Master recommended in the Report that the Court reject the equitable defenses of Colorado, recognize the pre-Compact pumping entitlement of Colorado in the amount of 15,000 acre-feet per year and find a violation of the Arkansas River Compact by the State of Colorado with regard to post-Compact well pumping. Rep., vol. I, at 170, vol. II, at 190-200, 336-37. These recommendations are largely in accord with Kansas' position. The Master recommended, however, that Kansas' usable flow method be rejected and that the other two claims by Kansas (Trinidad and WWSP) be denied. He also recommended that the two Colorado counterclaims (Lake McKinney and post-Compact wells in Kansas) be denied for failure of proof. Rep., vol. II, at 336-37.

During trial, each state presented a hydrologic model showing depletions[4] from post-Compact well pumping and the WWSP on flows at the state line. *Id.*, at 228-90. The depletions calculated by each model were then evaluated to determine the amount of depletions that would have been used in Kansas had they been available. *Id.*, at 291-305. According to Kansas' evidence, the net depletions to usable flow caused by increased Colorado pumping and the WWSP during the period 1950-85 were 489,000 acre-feet. Pl. Ex. 111***[5] (R. vol. 89, at 9, 85, vol. 99, at 5) Rep., App.,

[4] Depletions are negative effects on river flows. Depletions of usable flow are negative effects on river flows that would have been diverted by canals for irrigation or that would have recharged a groundwater aquifer. Accretions are positive effects on river flows. "Net" depletions are the depletions that remain after offsetting the effects of transmountain water imported to the Arkansas Basin from the Colorado Basin. Depletions of usable flow at the state line mean less water available to Kansas water users, a result the Compact was intended to prevent.

[5] Asterisks indicate revised versions of exhibits.

Ex. 11. The Master's usable flow method would reduce Kansas' claim by 124,000 acre-feet (25%). Rep., vol. II, at 303. Almost all of the difference in the results of the two methods arises in the period 1975-82, when the effects of a major drought were felt in Kansas, with stateline flows severely reduced and no flows at all for long periods at Garden City. Pl. Ex. 698 (R. vol. 127, at 127, 146), Pl. App., Item 5; Rep., vol. I, at 142; R. vol. 109 at 68-69, Pl. App., Item 25.

Kansas also submitted evidence on the violation of the Trinidad Reservoir Operating Principles from 1979 through 1984, based in large part on a 1988 Report of the Bureau of Reclamation.[6] *See* Rep., vol. III, at 409-10. The Bureau found that the Operating Principles had been departed from, and it performed certain computer modeling studies to quantify the effect of the departure from the Operating Principles on John Martin Reservoir. Jt. Ex. 23, at 55 (R. vol. 17, at 69, vol. 18, at 21, 22), Pl. App., Item 13. Before Colorado offered any evidence, the Master dismissed Kansas' claim because Kansas had not submitted evidence comparing actual operations with "no-project" conditions, an analysis that the Bureau had said was impossible. Jt. Ex. 23, at 26 (R. vol. 17, at 69, vol. 18, at 21, 22), Pl. App., Item 13.

On October 3, 1994, the Court received the Report, ordered it filed and set the schedule for exceptions and briefing. Kansas' Exceptions are submitted in accordance with that schedule.

SUMMARY OF ARGUMENT

I. Trinidad Reservoir Operating Principles.

The Master erred in allowing Colorado to disregard the Trinidad Operating Principles with impunity. The Operating Principles were officially adopted by the Compact Administration with the unanimous approval of the compacting states. Such approval was necessary in order for the project to be built. In return for

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[6] Neither state agreed in all respects, however,with the 1988 Bureau Report. *See*, Rep., vol. III, at 378, 396, 403.

this essential approval of the project, Colorado agreed to a method of assessing compliance with Article IV-D of the Compact. The Master's decision deprived Kansas of the benefit of this valid exercise of authority by the Compact Administration, while leaving intact the benefit Colorado received.

This Court has made it clear that unanimous decisions of interstate compact agencies, acting within the scope of their congressionally ratified powers, are binding and that it is improper to use this Court's original jurisdiction to redecide such issues. This Court has enforced such a resolution in the past. *See Texas v. New Mexico*, 462 U.S. 554 (1983). If resolutions of interstate compact agencies have no effect, the compacting states will refuse to adopt cooperative resolutions such as the Trinidad Operating Principles. Moreover, this Court should enforce detailed procedures adopted for the purpose of maintaining the Article IV-D standard.

II. Winter Water Storage Program (WWSP).

The Master decided that there was too much uncertainty in the evidence offered by Kansas to prove its claim regarding Colorado's Winter Water Storage Program. The major cause of such uncertainty was the lack of data which needed to have been collected in the past. The Master effectively placed the risk that there might be such uncertainty on Kansas. However, that is a burden that Kansas cannot possibly satisfy. Rather, the risk that there might be such uncertainty should be on the state that proceeded with the project without either (1) performing sufficient studies and collecting sufficient data to assure compact compliance or (2) agreeing to appropriate limitations necessary to insure compliance with Article IV-D of the Compact, as occurred for the Trinidad Project. That risk should have been placed on Colorado, the state benefitting from the program, not Kansas. Kansas had no way of collecting that data in 1976. It has no way of collecting that data today. The onus of not having collected that data should be on the state benefitting from the development and controlling the collection of the necessary data.

The Master also erred in rejecting the Kansas WWSP claim because he relied on an assumption that accretions might be offset against depletions that Kansas' evidence showed had occurred. Such reliance was incorrect because he found, and it is undisputed, that more evidence was needed to determine whether accretions should be offset against depletions. It was error to reject a claim on an admittedly incomplete record.

III. Usability of Stateline Depletions.

Generally stated, usability is the extent to which river flows (1) were, or would have been divertible at times when water is needed for irrigation or (2) were or could have been recharged to a groundwater aquifer. The method for determining usability adopted by the Master is contrary to Article IV-D of the Compact, which requires that the waters of the Arkansas River shall not be materially depleted in usable quantity or *availability for use* to the water users of Colorado and Kansas. Article IV-D embodies the basic understanding that the usability of waters crossing the state line can vary in time and amount. Therefore, techniques for analyzing usability which do not account for its variability in time and amount should be avoided to the maximum extent possible. The method chosen by the Master clearly does not do that. It averages usability not just over a week or a month, but over the whole study period of 36 years, 1950-85. If a more precise alternative to such an averaging method is available, it should be used to ensure compliance with Article IV-D of the Compact.

There is an alternative to the Master's averaging method. There is a method that recognizes the day-to-day variability of usability, namely, Kansas' usable flow method. Yet the Master rejected Kansas' method. He did so on three grounds, two of which are not related to the averaging method at all, but rather relate to questions of uncertainty that he had with respect to the separate hydrologic modeling. Any problems that he perceived with the hydrologic modeling should not have caused him to reject the better and separate method for determining usability. The third ground is merely Colorado's unproved allegation that post-Compact well pumping in Kansas has increased usability in Kansas beyond pre-Compact levels. The same evidence is required to support that allegation as was required to support the related Colorado counterclaim, which alleged that well depletions in Kansas had increased usability in Kansas and had caused increased calls for releases from John Martin Reservoir. The Master correctly recommended that that counterclaim be dismissed for failure of proof.

ARGUMENT

I. Colorado Has Violated the Arkansas River Compact by Admittedly Refusing to Abide by the Trinidad Reservoir Operating Principles.[7]

A. History of the Operating Principles.

The Master rejected Kansas' claim that violation of the Compact Administration's duly adopted Trinidad Reservoir Operating Principles constituted a violation of the Compact. Kansas presented evidence showing a violation of the Operating Principles and the resulting depletions to John Martin Reservoir conservation storage, part of which is allocated to Kansas under Article V of the Compact. *See* Pl. Ex. 580 (R. vol. 18, at 18), Pl. App., Item 3; R. vol. 18, at 9-10, 16-17, Pl. App., Item 20. The Master held that the Kansas evidence was insufficient because it did not compare the actual operations to pre-Compact conditions. Rep., vol. III, at 426. Departure from the Operating Principles is *ipso facto* a violation of the Compact, and it was entirely sufficient, for purposes of quantifying the effects of the violation, to compare the actual operation with simulated operation as it should have been under the Operating Principles.

Trinidad Reservoir is located just above the city of Trinidad, Colorado, in the southeastern part of the state near the New Mex-

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[7] This portion of the Brief relates to the Decision Of Special Master On Colorado's Motion To Dismiss Kansas' Trinidad Reservoir Claim. Rep., vol. III, at 373. The Master has requested that this decision be confirmed by the Court. Rep., vol. II, at 336.

ico border. The reservoir is an onstream reservoir on the Purgatoire River, which is the major tributary of the Arkansas River between Pueblo and John Martin Reservoir. The Purgatoire enters the Arkansas just above the reservoir. *See* Rep., vol. I, Map in pocket. When the project was authorized in 1958, it was recognized that operating limitations would have to be placed on the reservoir to insure compliance with the Compact. *See* Jt. Ex. 35, at 309 (R. vol. 111, at 5, 6), Pl. App., Item 15; Jt. Ex. 34, at 3-4, ¶ 97, at 29, ¶ 144, at 40 (R. vol. 17, at 77, 89), Pl. App., Item 14.

The Bureau of Reclamation thereafter undertook studies, completed in 1961 and 1964, on the basis of which it proposed the Operating Principles. Rep., vol. III, at 388-89. The Operating Principles were reviewed and approved by the Corps of Engineers, the Colorado Water Conservation Board and the Purgatoire River Water Conservancy District. In response to previous correspondence, H. P. Dugan, Regional Director of the Bureau of Reclamation, wrote to the Governor of Kansas on February 1, 1967, stating, in part:

> We are pleased to learn that the Kansas Water Resources Board, on the basis of our report on the irrigation function of the proposed Trinidad Project and additional information furnished by our representatives, has concluded essentially that *the proposed Trinidad Project will not materially deplete the water supply of the Purgatoire River and John Martin Reservoir providing the project is operated in strict conformity with the guidelines used in the Trinidad Project investigations and the "Operating Principles"* contained in the Bureau's Trinidad Irrigation Report.
>
> *We wish to assure you that the Bureau of Reclamation* in its planning investigations for the proposed Trinidad Project and in developing the "Operating Principles" therefor has been fully aware of and *has diligently and conscientiously endeavored to implement the provisions*

> *of the Arkansas River Compact* so that the interests of the State of Kansas at all times will be fully protected consistent with the provisions of the Arkansas River Compact. Jt. Ex. 44, at 1 (R. vol. 17, at 82, 89), Pl. App., Item 16. (Emphasis added.)

The Governor of Kansas subsequently requested that the Operating Principles be adopted by the Arkansas River Compact Administration. Jt. Ex. 45 (R. vol. 17, at 86, 89), Pl. App., Item 17. This was done by unanimous consent on June 6, 1967. *See* Jt. Ex. 19, June 6, 1967 minutes (R. vol. 17, at 87, 89), Pl. App., Item 12. The Operating Principles were thereby promulgated as an official action of the Compact Administration in furtherance of its mandate to implement the Arkansas River Compact. Colorado agreed to the Operating Principles in the forum provided by the Compact Administration. *See id.*; Jt. Ex. 99, at 1-2 (R. vol. 94, at 24; Admitted by Written Order of 11/16/93), Pl. App., Item 18.

Upon the Compact Administration's approval of the Operating Principles, Congress enacted legislation to provide funding, and the project was built. Rep., vol. III, at 394-95. At the first opportunity to store more water than was allowed by the Operating Principles, however, Colorado permitted the Trinidad Project to do so. Specifically, the water retained in the reservoir from 1979 was not counted against the water stored in 1980 as it should have been, resulting in the storage of water in 1980 that should have been allowed to flow downstream to other users, including Kansas users (a process known as "rollover"). Kansas immediately asserted before the Compact Administration that Colorado had violated the Compact. *See* Jt. Ex. 18-32, at 47-48 (R. vol. 20, at 100, vol. 21, at 34, 36), Pl. App., Item 11. Also, Colorado permitted the storage of winter flows in the reservoir outside the reservoir storage right, with the same effect that water was stored which should have been passed to downstream users, including Kansas users. *See* R. vol. 18, at 9-10, Pl. App., Item 20. Kansas' assertion that these actions violated the Operating Principles was accepted by the Master for purposes of Colorado's Motion to Dismiss (Rep., vol. III, at 378), which is consistent with the conclusions of the Bureau of Reclamation that rollover and the unauthorized storage of winter water each constitute "a departure from the intent of the Operating Principles." Jt. Ex. 23, at 55 (R. vol. 17, at 69, vol. 18, at 21, 22), Pl. App., Item 13. The Bureau determined that Colorado's failure to abide by the intent of the Operating Principles resulted in average annual depletions of inflows into John Martin Reservoir totalling 11,600 acre-feet for the period 1979-84. *Id.*, at Table 4, Pl. App., Item 13. The Kansas evidence, based on monthly depletions rather than annual averages, showed such depletions to be as high as 27,500 acre-feet for the period 1979-84.[8] Pl. Ex. 580 (R. vol. 18, at 18), Pl. App., Item 3.

B. This Court Should Honor a Unanimous Decision of the Arkansas River Compact Administration.

The Master has accepted Colorado's argument that official action of the Arkansas River Compact Administration is not effective to set procedures for operation of Trinidad Reservoir necessary to comply with the Compact. It was the Master's position that Kansas cannot rely on the official action of the Compact Administration in adopting the Operating Principles but must prove anew in this Court that operation of Trinidad Project in violation of the Operating Principles caused stateline flows to be materially depleted in usable quantity or availability for use. The Master's position requires that the original jurisdiction of this Court be burdened by trial and proof on an issue already decided by the Arkansas River Compact Administration, a body created by the Arkansas River Compact and empowered to implement that Compact.

In *Texas v. New Mexico*, 462 U.S. 554 (1983), this Court addressed a similar question with regard to the Pecos River Com-

[8] Kansas generally received 40% of inflows to John Martin Reservoir during the study period. *See* Rep. vol. I, at 47.

pact (Act of June 9, 1949, ch. 184, 63 Stat. 159) and the relationship between the Pecos River Commission and this Court. The Court described the Pecos River Commission as follows:

> The Compact also established the Pecos River Commission as a permanent body, in more or less the same form that it had during the negotiations on the Compact. It was to have three Commissioners, one from each State and one representing the United States, but the United States representative could not vote. Art. V(a). Accordingly, the Commission could take official action only with the concurrence of both state Commissioners. The Commission was given broad powers to make all findings of fact necessary to administer the Compact, Arts. V(d)(5)-(10), as well as to"[e]ngage in studies of water supplies of the Pecos River" and to "[c]ollect, analyze, correlate, preserve and report on data as to the stream flows, storage, diversions, salvage, and use of the waters of the Pecos River and its tributaries," Arts. V(d)(3), (4). 462 U.S., at 560.

The Arkansas River Compact Administration is almost identical to the Pecos River Commission. The Arkansas River Compact Administration is also a permanent body established by the Arkansas River Compact in more or less the same form that the Arkansas River Compact Commission had during the negotiations on the Compact. *See* Compact Preamble, Art. VIII, Rep., App., Ex. 1, at App. 1, 11-15. Instead of one commissioner from each state and one representative of the United States, each state has three representatives, and there is one federal representative. *Id.*, at App. 12. However, exactly like the Pecos River Compact Commission, each state has but one vote, and the federal representative cannot vote. *Id.* The Compact Administration can take official action only with the concurrence of both states. *Id.* The Compact Administration may make findings of fact, although, just like the Pecos River Commission, such findings "shall not be conclusive in any court, or before any agency or tribunal but shall constitute prima facie evidence of the facts found." *Id.*, at App. 15; Pecos River Compact, Art. V(f), 63 Stat. at 163. Also like the Pecos River Commission, the Compact Administration is authorized to engage "in the systematic determination and correlation of the facts as to the flow and diversion of the waters of the Arkansas River" and "the procurement, interchange, compilation and publication of all factual data bearing upon the administration of this Compact. . . ." Compact Art. VIII-G, Rep., App., Ex.1, at App. 14.

The Court described New Mexico's contention with respect to the relationship of this Court to the Pecos River Commission as follows:

> It contends that this Court may do nothing more than review official actions of the Pecos River Commission, on the deferential model of judicial review of administrative action by a federal agency, and that this case should be dismissed if we find either that there is no Commission action to review or that the actions the Commission has taken were not arbitrary or capricious. Thus, in New Mexico's view, this suit may be maintained only as one for judicial review of the Commission's quantification of the 1950-1961 shortfall,[9] and the implied acceptance of the Review of Basic Data which, New Mexico argues, that entailed. According to New Mexico, "[this] Court has no authority to act *de novo*

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[9] This language refutes the Master's assertion in the case now at bar that "the Court did nothing more than go along with a unanimous finding of the Commission as to river flow depletions for certain years." Rep., vol. III, at 420-21. That the Commission's quantification was a contested issue is further borne out by one of New Mexico's "Questions Presented" in that case: "Whether the Court should review findings of fact the Commission made in 1962 . . . ." New Mexico's Brief in Support of Exceptions at i (Dec. 2, 1982), *Texas v. New Mexico*, 462 U.S. 554 (1983) (No. 65, Original), Pl. App., Item 30.

> or assume the powers of the Pecos River Commission." . . . We disagree. 462 U.S. at 566-67 (footnote added).

In the course of its emphatic response to New Mexico's position, the Court stated the following:

> Considerations outside the Compact itself also render New Mexico's theory of the role of this Court untenable. According to New Mexico, Texas may seek judicial review in this Court of decisions actually made by the Commission—presumably on the votes of both State's Commissioners. That is not the proper function of our original jurisdiction to decide controversies between two States. In recent years, we have consistently interpreted 28 U.S.C. § 1251(a) as providing us with substantial discretion to make case-by-case judgments as to the practical necessity of an original forum in this Court for particular disputes within our constitutional original jurisdiction. . . . . We exercise that discretion with an eye to promoting the most effective functioning of this Court within the overall federal system . . . . *If authorized representatives of the compacting States have reached an agreement within the scope of their congressionally ratified powers, recourse to this Court when one State has second thoughts is hardly "necessary for the State's protection," Massachusetts v. Missouri*, 308 U.S. 1, 18 (1939). Absent extraordinary cause, we shall not review the Pecos River Commission's actions without a more precise mandate from Congress than either the Compact or 28 U.S.C. § 1251 provides. 462 U.S. 554, 570-71 (1983) (emphasis added; footnote and citations omitted).

In a footnote to this passage, the Court said, in part:

> *When it is able to act, the Commission is a completely adequate means for vindicating either State's interests.* The need for burdensome original jurisdiction litigation, which prevents this Court from attending to its appellate docket, would seem slight. *Id.* at 571 n. 18 (emphasis added).

Here, the authorized representatives of the compacting states (the Colorado and Kansas Compact Administration members) have reached an agreement (the Operating Principles) within the scope of their congressionally ratified powers (to implement and prescribe procedures under Article VIII-B). Therefore, recourse to this Court by Colorado is hardly necessary for Colorado's protection. In this action, Colorado has not requested that the Court review the action of the Compact Administration adopting the Operating Principles, let alone shown "extraordinary cause" for granting such a request. Further, the Court has held that when the Compact Administration is able to act, as occurred in its adoption of the Operating Principles, the Administration is a completely adequate means for vindicating Colorado's interest, and resort to this Court's original jurisdiction on the subject of the agreement, namely, the Operating Principles, is not needed.

Article VIII-A of the Compact creates the Compact Administration and Article VIII-B empowers the Compact Administration to adopt regulations, prescribe procedures and perform all functions required to implement the Compact. Article VIII also provides for the membership of the Compact Administration: water right owners from specified areas within the basin and the chief water officials of each state. In addition, considerable expertise is made available to the Administration through the water agencies of the two states and the federal government. The Compact Administration is clearly invested with considerable access to technical expertise in making decisions such as the one it made on June 6, 1967, when it adopted the Operating Principles.

The Master decided that "the Compact Administration did not do, nor intend to do, what Kansas now claims." Rep., vol. III, at

414. He further stated, "I find nothing to indicate that the-Compact representatives of either State thought they were exercising binding authority under Article VIII-B." *Id.*, at 415. The Master appears to rest this conclusion on the fact that the Bureau of Reclamation was the body which developed the Operating Principles and that the Operating Principles had been widely accepted by other parties prior to being voted on by the Compact Administration. *See id.*, at 414. He also seems to have based it on the approval of the Governor of Kansas subject to the acceptance of the Operating Principles by the Compact Administration, and the fact that the primary subject of discussion at the meeting at which they were adopted was the set of additional conditions requested by Kansas. *Id.*, at 414-15. These are odd grounds to cite as a basis for determining the intentions behind governmental action. The primary source for determining the Compact Administration's intent should be the terms of the promulgation itself. *See, e.g., Negonsott v. Samuels*, 113 S. Ct. 1119, 1122-23 (1993), *Reeves v. Ernst & Young*, 113 S. Ct. 1163, 1169 (1993).

The Operating Principles themselves refute the Master's conclusion. The first sentence of the document provides as follows:

> The Trinidad Dam and Reservoir Project as reported in House Document No. 325, 84th Congress, 2d Session, and as authorized by the Flood Control Act of 1958, will be operated in such a manner as to secure the greatest practicable benefits from the regulation and use of the flows of the Purgatoire River consistent with the laws and policies of the State of Colorado and of the United States including the Arkansas River Compact. Jt. Ex. 19, June 6, 1967 minutes (R. vol. 17, 87, 89), Pl. App., Item 12, at A-52 to -53.

These are clearly mandatory words—"The Project . . . will be operated in such a manner. . . ." These are not words of mere courtesy or advice. These words show an intent on the part of the governmental body adopting them that they are mandatory and expected to be enforceable. The substantive provisions are expressed in the same imperative language. For example, Article III on Flood Control provides, in pertinent part, as follows:

> Trinidad Reservoir shall be operated for flood control benefits in accordance with regulations prescribed by the Secretary of the Army and the following operating principles:
>
> 1. All potentially damaging flood inflows shall . . . .
> 2. All flood waters stored in the flood control capacity shall . . . .
> 3. Any inflow, other than that stored for irrigation use, temporarily retained below the bottom of the flood control capacity for flood control purposes shall . . . . *Id.*, at A-56 (emphasis deleted).

Article IV-Irrigation is no less mandatory:

> Administration of the irrigation capacity in Trinidad Reservoir and the distribution of water to the District Irrigable Area will be made by the District in accordance with House Document No. 325, 84th Congress, 2d Session, and these operating principles. . . .
>
> A. . . .
>
> 1. The water users within the District shall assign . . . .
>
> 2. Waters of the Purgatoire River shall be stored . . . .
>
> B. . . .
>
> 1. The acreage irrigated by the District water supply shall be limited . . . .
> 2. All water deliveries to the 19,717 acres of the District irrigable area will be limited . . . .

3. No water deliveries for irrigation of the 19,717 acres of the District irrigable area will be made . . . . *Id.*, at A-56 to -59 (emphasis deleted).

This listing of mandatory terms could be continued through every operative provision of the Operating Principles. Thus, the strongest evidence, the document itself, consists entirely of terms that are not merely directory or advisory, but mandatory, showing a self-conscious exercise of binding authority by the Compact Administration.

The sources to which the Master resorted to support his conclusion are unpersuasive. The fact that the wording was not generated within the Compact Administration itself is not persuasive. Governmental entities borrow language from documents and enactments generated by other governmental bodies. The sharing of such ideas is common in the federal system. The rules of civil procedure of the federal and state judiciaries are an immediate example. The enactment of uniform laws among the states is a manifestation of another kind of intergovernmental sharing of statutory provisions. No one suggests that the promulgation of such provisions is any less binding because of the source of the language in those provisions. Nor are they denigrated on the basis that other governmental entities have accepted those same provisions.

The Master also refers to the "prior" approval of the Governor of Kansas. However, it is clear that the approval of the Governor of Kansas was contingent upon the acceptance of the Operating Principles by the Compact Administration. *See* Jt. Ex. 45 (R. vol. 17, at 86, 89), Pl. App., Item 17. If the adoption of the Operating Principles by the Compact Administration was a useless act as the Master suggested, there would have been no reason for the Governor of Kansas to insist upon that act. Prior approval by other governmental entities would not be expected to deprive a subsequently acting governmental entity of the intent expressed in the enactment itself.

The Master also seemed to take comfort from his assertion that the primary subject of discussion at the Compact Administration meeting at which the Operating Principles were adopted was the inclusion of the five additional Kansas conditions. This is contrary, however, to the suggestion of the chief Colorado representative on the Compact Administration when he introduced the issue: "Mr. Sparks was asked to present the Trinidad Project for consideration. He said the project had been before the Administration for a long time and he asked if Kansas had any further questions on the project." Jt. Ex. 19, June 6, 1967 minutes (R. vol. 17, at 87, 89), Pl. App., Item 12, at A-50. The fact that the project had been before the Administration for a long time belies the Master's suggestion that the only thing of interest to the Administration was the set of additional Kansas conditions. Those were simply the last addition to the Operating Principles and therefore a natural subject of discussion. The reference to the possibility of "further questions" from Kansas also suggests previous discussions, whether on or off the record, concerning the project. Indeed, the issue of the Trinidad Project, operating principles and the appropriate form of Commission action had been before the Compact Administration for many years. *See* Rep., vol. III, at 386-87; Jt. Ex. 34, ¶ 144, at 40 (R. vol. 17, at 77, 89), Pl. App., Item 14.

This Court drew a strong distinction in *Texas v. New Mexico* between review of a compact commission's decision where there had been affirmative and unanimous action by the commission and the absence of commission action. *See* 462 U.S. at 566-71. The Court continued this distinction more recently in *Oklahoma v. New Mexico*, 501 U.S. 221 (1991). There the Court rejected a Master's recommendation to remand to the Canadian River Commission a question which had not already been determined by a unanimous decision of the commission. The Court rejected the recommendation saying that "this Court must pass upon every question essential" to a determination of a controversy between the states. 501 U.S. at 241. Here, however, adoption of the Trinidad Reservoir Operating Principles constitutes a prior and unanimous decision of the Compact Administration, so the very predicate of the Court's ruling in *Oklahoma v. New Mexico* is lacking.

C. Kansas and Other States Need To Be Able To Rely on Unanimous Actions of Interstate Compact Agencies.

The question involved here is one of principle that will determine for the indefinite future whether Kansas can rely on resolutions of the Arkansas River Compact Administration relating to details of compliance with the Arkansas River Compact. The direction that Kansas receives from the Court will also serve as a guide to other states and other interstate compact commissions and administrations.

The language of the Compact indicates that the states generally should implement the Compact through joint action of the Arkansas River Compact Administration. *See* Compact Art. VIII, Rep., App., Ex. 1, at App. 11-15. Certainly there is no indication that violations could be shown and resolved only by resort to the original jurisdiction of this Court.

As a practical matter, if the compacting states cannot rely on unanimous resolutions of the interstate compact agency charged with implementing a compact, such as resolutions setting standards for operation of new facilities to insure compliance with a compact, the willingness of compacting states to agree to such resolutions will be reduced. As the Master recognized, this federal project would not have been funded by Congress absent the concurrence of Kansas. Rep., vol. III, at 431. Moreover, the U.S. Bureau of Reclamation assured Kansas that the Operating Principles would implement the Arkansas River Compact and would be strictly complied with. *See* Jt. Ex. 44, at 1 (R. vol. 17, at 82, 89), Pl. App., Item 16. In order for useful projects to be considered in the future, therefore, at least where they involve federal resources or property, the concurrence of the downstream state is necessary. If such cooperation is to be forthcoming, the downstream state will need to be able to rely on commitments by the upstream state. The Master's decision would thwart that process.

D. Enforcement of the Operating Principles Will Not Modify the Compact.

An interstate compact adopted under Article I, Section 10, Clause 3 of the United States Constitution cannot be changed by the interstate agency created by the compact. *See, e.g., Texas v. New Mexico*, 462 U.S. 554, 564-65 (1983). The Master's primary concern in denying the Kansas claim was that the Compact not be altered through the actions of the Compact Administration. *See* Rep., vol. III, at 421.

The Master's concern is unjustified. The Operating Principles were proposed by the U.S. Bureau of Reclamation and adopted by the Arkansas River Compact Administration in the belief that they were necessary to implement and prevent violation of the Arkansas River Compact, particularly Article IV-D. *See* Jt. Ex. 44, at 1 (R. vol. 17, at 82, 89), Pl. App., Item 16. The Master agreed that the Operating Principles were expected to provide protection against material depletion of usable flow under Article IV-D. Rep., vol. III, at 425-26. Far from altering the Compact, the Operating Principles carry out the intent of the Compact and ensure compliance with it.

The Master assumed that enforcement of the Operating Principles would bestow benefits on Kansas, contrary to the purposes of the Trinidad Project. Rep., vol. III, at 424-25. The only evidence, however, that might be thought to support such a conclusion was the 1988 study by the Bureau of Reclamation of the 1925-57 period. *See* Rep., vol. III, at 401; Jt. Ex. 23, at 28-29 (R. vol. 17, at 69, R. vol. 18, at 21, 22), Pl. App., Item 13. The Bureau itself never drew such a conclusion. The 1925-57 period is not the period of operation (1979-84). When Colorado analyzed the Winter Water Storage Program by similarly analyzing a period when the Program was not in operation, the Master rejected the evidence. *See* Rep., vol. II, at 317-18. There the Master recognized that the period of analysis can make a significant difference in the effect of the program because of differing hydrologic and institutional conditions. *See* Rep., vol. II, at 318.[10] The same conclusion is applicable to selection of a suitable study period to analyze the Operating Principles. The suitable period is obviously the only period of operation, 1979-84. No such analysis has been performed. Therefore, the Master's conclusion is of doubtful validity.

II. Colorado's Winter Water Storage Program Has Violated the Arkansas River Compact.

A. Introduction.

The Master recommended that Kansas' WWSP claim be denied because (1) it is too uncertain and (2) accretions might offset depletions. Rep., vol. II, at 329-35. For several reasons, the WWSP claim should not be rejected. The Kansas experts determined there was a violation in the amount of 40,000 acre-feet of depletions to usable flow during the operation of the program (1976-85). Pl. Ex. 111''' (R. vol. 89, at 9, 85, vol. 99, at 5), Rep., App., Ex. 11. No other evidence of depletions or lack thereof was submitted for the 1976-85 period of operation. Colorado analyzed a different period, when the program was not operating. Rep., vol. II, at 317. Yet even with several favorable assumptions, Colorado also found depletions of total flow, in excess of 9,000 acre-

[10] The Master sought to justify his use of averages to assess the Bureau of Reclamation's study results on the basis that Kansas did not object to the use of averages to evaluate the 1961-64 Bureau of Reclamation studies. Rep., vol. III, at 426-28. On the one hand, he said that Colorado is not bound by the Operating Principles; on the other, he said that Kansas is bound by references to averages that do not even appear in the Operating Principles. *See id.*; Operating Principles, Pl. App., Item 19. Moreover, there is little logic in the Master's position that use of averages to determine whether to adopt the Operating Principles dictates that departures from the Operating Principles should also be quantified using averages, especially in light of the denigration of averages in *Colorado v. Kansas*, 320 U.S. 383, 396-97 (1943) and the emphasis in Article IV-D on "availability for use."

feet. *Id.*, at 318. The Master rejected the evidence of depletions, however, holding that the results are too uncertain, placing the onus of uncertainty on Kansas, yet it was Colorado that obtained the benefits of the WWSP; it was Colorado that unilaterally initiated the WWSP without the benefit of prior sufficient studies and data collection now found necessary by the Master. Rep. vol. II, at 334-35. Kansas should not be penalized for a situation created by Colorado and from which only Colorado received benefits.

The Winter Water Storage Program has been operating in Colorado since 1976, a period of approximately 18 years. *Id.*, at 309. The period of operation for which evidence is before the Court is 1976-85 (except 1978—a year in which the program did not operate). *Id.* Common sense leads to the conclusion that putting water on the fields in the heat of summer results in more evaporation and other losses than irrigating fields without crops in the cold of winter. Indeed, the hydrologic modeling performed both by Kansas and Colorado shows that the WWSP causes depletions under widely varying hydrologic conditions. *See id.*, at 316, 318. The Kansas evidence indicates that during the nine years of the WWSP's operation, the program caused depletions at the state line of 53,000 acre-feet, of which 40,000 were usable under-Kansas' usable flow method. Pl. Ex. 111''' (R. vol. 89, at 9, 85, vol. 99, at 5), Rep. App., Ex. 11.[11] Colorado, simulating the WWSP in that part of the study period in which the WWSP did not operate (1950-75 and 1978), also found depletions, as described below. The United States took two positions. *See* Rep., vol. II, at 318-22. The Bureau of Reclamation official called by the United States testified that he believed the program did comply with the Compact. Rep., vol. II, at 320-21. On the other hand, the expert witnesses called by the United States took the position

[11] Under the usable flow method accepted by the Master, the corresponding usable depletions for the period 1976-85 are 27,000 acre-feet. Rep., vol. II, at 316 n.134.

that it was impossible to determine whether or not the program complied with the Compact. *See* Rep., App., Ex. 9, at App. 103.

Given this state of the evidence, the Master attempted to apply the preponderance of the evidence test. Rep., vol. II, at 335. In effect, he said that it was more likely than not that there were no material depletions of usable flow as a result of the WWSP. Despite sizeable depletions determined by the Kansas model (53,000 acre-feet) and smaller but not immaterial depletions under different hydrologic conditions determined by the Colorado model, the Master in effect found it was still more likely that there were no depletions at all. This is an inherently implausible result.

B. The Master Erred in Placing the Risk of Uncertainty Resulting From Lack of Data on Kansas.

With regard to the WWSP, the Master concluded "that the depletions shown by the Kansas model are well within the model's range of error." Rep. at 334-35. The Master mistakenly assumed that this fact rendered the claim negligible. The depletions calculated by the Kansas model caused by the Colorado Winter Water Storage Program are 53,000 acre-feet. Pl. Ex. 111*** (R. vol. 89, at 9, 85, vol. 99, at 5); Rep., App., Ex. 11, at App. 118. The range of error associated with the figure 53,000 acre-feet is very difficult to quantify, and no one has attempted to do so.[12] R. vol. 127 at 117-19, Pl. App., Item 28. During cross-examination, the lead Kansas expert was asked to estimate the range of error. He estimated it to be less than ± 50%. R. vol. 128, at 107-08, Pl. App., Item 29. If it were as much as ± 50%, the range of error would be 53,000 ± 26,500 acre-feet. A depletion of 26,500 is

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[12] The uncertainty quantified in the Report is not the uncertainty of calculated depletions. The Report quotes evidence of uncertainty in the prediction of stateline flows, a very different quantity. Rep., vol. II, at 323-25; R. vol. 127, at 117-19, Pl. App., Item 28. It amounts to a precise answer to the wrong question. The evidence simply does not support the finding that 53,000 acre-feet is within the uncertainty of the model.

certainly material, and 79,500 acre-feet is obviously even more so.[13]

None of the experts deny that there is uncertainty with respect to the modeling results of either state. Much of the source of the uncertainty in the WWSP analysis is the lack of adequate data. R. vol. 127, at 118-19, Pl. App., Item 28. The risk of the lack of adequate data should be borne by the state that initiates and benefits from post-Compact development without collecting the data within its jurisdiction or doing the studies needed to support a good faith belief that the development will comply with the Compact.

The Master effectively held in favor of Colorado, the upstream state that initiated the WWSP without sufficient studies, the state that benefitted from this development, and the state that had effective control over the collection of data. He placed the risk of uncertainty in the modeling results, which was caused by the lack of data, squarely on Kansas, the downstream state. *See* Rep., vol. II, at 329-35. Yet Colorado proceeded with the WWSP without collecting the data or doing the studies needed to support a good faith belief that this development would comply with the Compact.[14] And Colorado, as a practical matter, has had control over (1) existing data in Colorado and (2) the determination whether to collect additional data that may be needed. Colorado literally controls the amount of data available. It is sovereign within its borders, and while the Arkansas River Compact allows for cooperative gathering of data relevant to the Compact (*see* Art. VIII), no Administration action can be taken without the concurrence of Colorado. *See id.*

Kansas has presented evidence based on the best data available. Rep., vol. II, at 250. It has relied upon some of the best experts available (*Id.*, at 232), yet because of Colorado's lack of data collection during the study period, Kansas has been blocked by the

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[13] These values would be reduced to usable amounts by the appropriate usable flow method.

[14] Cf. Rep., vol. II, at 321-22.

Master on the basis that there is too much uncertainty in its evidence.

This Court recommended in *Colorado v. Kansas* and other equitable apportionment cases that the states solve their differences by compact. It is not consistent with that policy to allow one state to take unilateral action to the detriment of the other compacting state. To allow Colorado to fail to collect data, to "hide in the noise" of the existing and inadequate data (*see* Rep., App., Ex. 9, at App. 103), to initiate and to benefit from, a post-Compact development, and then to deny Kansas protection under the Compact because modeling results are made uncertain by the same lack of data, emasculates Article IV-D of the Compact. Such a ruling encourages states to initiate post-Compact developments without definitively testing compact compliance and discourages the collection of data that would help determine compact compliance.

The placement of the burden of proof is a matter of public policy and substantive law. *American Dredging Co. v. Miller*, 114 S. Ct. 981, 988 (1994). The public policy in this case should not reward the state that proceeds without adequate prior studies, that benefits from the project and that controls the data necessary for the determination of compact compliance by placing the whole burden on the downstream state. Rather, even if the ultimate burden of persuasion is on the plaintiff state, it would be fundamentally unfair also to place on the plaintiff state the burden of production of data from the defendant state.

Colorado also independently analyzed the WWSP claim with its hydrologic model, and it also found depletions. Rep., vol. II, at 318. Although it analyzed the wrong period, namely the period during which the WWSP was not operating, it found during that period that the WWSP would have caused depletions in excess of 9,000 acre-feet. *Id.*[15] And this is in spite of the fact that it made important assumptions in its own favor.[16] Thus, both Kansas

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[15] The 9,000 acre-foot figure represents simple depletions at the state line as opposed to usable depletions. *Id.*

[16] Colorado assumed (1) no effect from the WWSP between Pueblo

and Colorado have determined that the Winter Water Storage Program creates depletions not only when analyzed for the period in which it actually operated but also hypothetically in the other years of the study period in which it did not operate. Common sense and all available evidence indicate that the WWSP causes depletions.

In *Commercial Molasses Corp. v. New York Tank Barge Corp.*, 314 U.S. 104, 111 (1941), this Court noted that the burden of proof, which is synonymous with the burden of persuasion, is usually placed on the party with the better opportunity to know the fact in issue. While *Commercial Molasses* involved a bailment, the principle is not confined to that area of law. *See* 9 John H. Wigmore, *Evidence* §§ 2487-89 (Chadbourn rev. 1981). Here the Master's rejection of Kansas' WWSP claim places on Kansas not only the burden of persuasion but also the burden of coming forward with evidence.[17] The Master's approach ignored the fact that the data were accessible to Colorado, but not to Kansas. In comparable circumstances, the law has placed the burden of coming forward with evidence on the party with access to data. *See e.g., Ybarra v. Spangard*, 25 Cal.2d 486, 154 P.2d 687, 689 (1944). As this Court has noted: "The ordinary rule, based on considerations of fairness, does not place the burden upon a litigant of establishing facts peculiarly within the knowledge of his adversary." *United States v. New York, N.H. & H. R.R.*, 355 U.S. 253, 256 n.5 (1957). The concepts of fairness noted in these cases

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and Las Animas, a stretch of more than 100 river miles in the heart of the WWSP area, *id.*, at 317, n. 136, vol. I, Map in pocket; (2) accretions can be offset by Colorado against depletions no matter when they occur during the 27-year period, *see* Def. Ex. 134*, at 8.1 (R. vol. 83, at 71, vol. 86, at 160, vol. 115, at 97), Pl. App., Item 6; and (3) high winter evaporation, which tends to minimize the difference between winter and summer evaporation, and thus the calculated effect of the WWSP. *See* Rep., vol. II, at 317 n. 136.

[17] For the most recent discussion of the difference between these burdens, see *Office of Workers' Compensation Programs v. Greenwich Collieries*, 114 S.Ct. 2251, 2255-56 (1994).

compel the conclusion that, when all available data indicate depletions, the state that has control over data and that initiates a program should be the state that bears the burden of producing evidence to reduce uncertainty. The Master not only required Kansas to present a prima facie case but also relieved Colorado of the burden of coming forward with evidence to reduce assumed uncertainty in the Kansas evidence of depletions. He placed the burden of reducing uncertainty on Kansas, the party least able to carry that burden. This Court should reject that approach.

Here, the uncertainty perceived by the Master is the only bar to Kansas' satisfying its burden, other than the possibility of offsetting by accretions, discussed below. The Kansas model calculated depletions of 53,000 acre-feet, which the Kansas experts testified was their best estimate given the data limitations. Rep., vol. II, at 250; Pl. Ex. 111''' (R. vol. 89, at 9, 85, vol. 99, at 5), Rep. App., Ex. 11; R. vol. 127, at 118-19, Pl. App., Item 28. Even the attempts by the Colorado expert to alter the Kansas model to eliminate calculated depletions did not succeed. *See* Def. Ex. 1011, Comparison 4 (R. vol 133, at 61, vol. 139 at 44, 83), Pl. App., Item 7; Def. Ex. 1012, Comparison 4 (R. vol. 138, at 65, vol. 139, at 44, 83), Pl. App., Item 8.[18]

When the evidence presented by the two states is fully considered, together with the results of the work by the Colorado expert to alter the Kansas model more to his liking, it is striking that WWSP depletions just will not go away. Neither will the uncertainty in the exact quantification go away. Kansas is entitled to protection under the Compact. Any uncertainty it could do nothing about and which resulted from the unilateral action of Colorado only increases the need for protection.

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[18] The Colorado expert did not propose his results as independently reliable quantifications of depletions caused by the WWSP, but only as preferable in his opinion if the Kansas model were accepted. Rep., vol. II, at 288-89.

C. The Master Relied on a Basis as to Which the Record Was Admittedly Incomplete.

The Master based his decision to reject Kansas' Winter Water Storage Program claim on the proposition that if accretions were taken into account, then depletions would be essentially eliminated.[19] Rep., vol. II, at 335. The Master should not have relied on evidence of accretions to defeat Kansas' WWSP claim. Earlier in his Report, he examined the question of accretions and determined that the "issue needs to be examined." Rep., vol. II, at 263. He went on to say, "[I]f my conclusion on liability is confirmed by the Supreme Court, then, to refine the total amount of depletions, additional evidence will be required during the remedies phase of the trial." *Id.* Nevertheless, when the Master arrived at the question of whether the evidence showed that Colorado violated the Compact by operation of the WWSP, without waiting for the evidence that he had indicated was necessary, he rejected the Kansas claim in part on the basis of accretions. *See* Rep., vol. II, at 335. This is inconsistent with simple fairness; it is inconsistent with the precedents of this Court and it is inconsistent with the need the Master expressed for further evidence on accretions. At the very least,[20] the conclusion as to whether Kansas established its WWSP claim should have awaited a determination of the status of accretions. The Master himself stated:

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[19] "Accretions" are calculated increases in monthly stateline flows from the amount of water that would have flowed across the stateline absent the institutional change in Colorado.

[20] Kansas contends that offsetting monthly accretions against monthly depletions is contrary to the Article IV-D proviso that the waters of the river "not be materially depleted in usable quantity or availability for use . . . ." There is no evidence that would support the Master's suggestion that accretions can be used to offset the depletions forbidden by Article IV-D. Unlike the Rio Grande Compact of ten years earlier, Act of May 31, 1939, ch. 155, 53 Stat. 785, the Arkansas River Compact contains no provision for debits and credits. Cf. *id.*, at Art. VI. The Master reserved his ruling on this issue. Rep., vol. II, at 263.

> Kansas properly seeks protection against an averaging process that would allow depletions to be offset by later accretions that might not be usable because of amount or timing, or might simply come too late to compensate for earlier injury. Article IV-D of the compact addresses not only quantity but also protects the "availability for use" of Stateline flows. Rep., vol. II, at 262.

It is inconsistent with his stated position on the propriety of protecting Kansas from having accretions offset against depletions in other months, as stated above, to rely on the calculation of accretions to defeat the Kansas WWSP claim. The Master stated that "depletions are essentially eliminated if accretions are taken into account." Rep., vol. II, at 335. It is erroneous to rely on accretions when the Master has stated that additional evidence is necessary in order to determine when accretions may be offset against depletions, if at all, and when they may not.

The Master's reliance on accretions to defeat the Kansas WWSP claim is inconsistent with this Court's holding in *United States v. Texas*, 339 U.S. 707 (1950). In that case, there was no dissent from the following statement in the majority opinion: "The Court in original actions, passing as it does on controversies between sovereigns which involve issues of high public importance, has always been liberal in allowing full development of the facts." 339 U.S. at 715. Here we have a situation in which the Master has declared in no uncertain terms that more evidence is needed on remand with regard to the status of accretions. In the same Report, however, he seeks to support his final conclusion with respect to the Kansas WWSP claim by relying on the very same accretions. Such reliance would not be appropriate in the normal case, and it is even less appropriate in a case between sovereigns where this Court has specifically indicated the need for full development of the facts before making a decision.

III. Kansas' Method for Determining the Usability of Depletions is the Only Proposed Method Consistent With the Compact.

A. Introduction.

Article IV-D of the Compact prohibits material depletions "in usable quantity or availability for use." Thus, depletions from post-Compact developments calculated by the experts of the parties must be analyzed to determine how much of the depletions are usable. The foregoing language of Article IV-D, understood with the help of the prior decision of this Court, requires a daily analysis of usability if at all possible. Yet the Master chose the opposite — a usability analysis which depends on long-term averages and pays no heed to the availability-for-use criterion. Moreover, because of the hydrologic conditions present during one part (1975-82) of the study period (1950-85), the method chosen by the Master underestimates usable depletions to Kansas water users by 124,000 acre-feet. *See* Rep., vol. II, at 303; Pl. Ex. 698[21] (R. vol. 127, at 127, 146), Pl. App., Item 5.

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[21] Plaintiff's Exhibit 698 is Item 5 in the Appendix. This bar graph is a comparison of the two methods for determining usability under discussion. In red is shown the method proposed by Kansas (SWE method). In purple is shown the method adopted by the Master (HCI method with Larson coefficients). This graph shows *cumulative* usable stateline depletions. Thus, the amount shown for each year is not the amount of usable depletions in that year by each method. Rather, the amount shown for each year is the accumulated usable depletions from the beginning of the study period in 1950 up to that year, all added together. The graph shows that the methods are quite comparable until about 1975, when they begin to diverge, the red bars representing the method proposed by Kansas increasing at a higher rate than the purple bars representing the method adopted by the Master. However, the cumulative difference between the two methods stops changing in 1982. In other words, the difference that has been built up between 1975 and 1982 is not increased further in the later years. That difference simply remains constant, which means that the two methods are calculating comparable amounts of usable depletions in each of those later years.

Kansas proposed the most appropriate method for determining the usability of depletions caused by post-Compact developments in Colorado. This method takes into account conditions in Kansas on a daily basis throughout the study period. Rep., vol. II, at 301-02. These conditions include the river flow at the state line and downstream in Kansas to Garden City, precipitation in Kansas, and whether the ditches in Kansas are diverting essentially all of the flow available to them. *See* R. vol. 89, at 40-50, Pl. App., Item 24. A determination is then made for each day of the study period whether all of the flow at the state line is being used in Kansas either for diversion or groundwater recharge. *Id.* If essentially all of the water flowing across the state line is being used on a certain day, and there is more capacity to use additional water if it is available, then that is a day on which additional flows are assumed to be usable. *Id.* When this analysis is done for a complete month, the percentage of days on which additional flow was determined to be usable is assigned to that month. *Id.* The percentage thus determined is multiplied against the depletions calculated by the Kansas model[22] for that same month.

Colorado also proposed a usable flow method that avoided averaging for periods longer than a month. Rep., vol. II, at 296. It applied its usable flow method in conjunction with the monthly output of its model. *Id.*

Another usable flow methodology is relevant in this context. C.L. Patterson was Chief Engineer for the Colorado Water Conservation Board and one of Colorado's original Compact Com-

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Thus, this Exhibit graphically shows that the two methods are very comparable both before 1975 and after 1982, indicating that it is only the extreme drought conditions present in the years 1975 to 1982 that cause the two methods to diverge with regard to their results. Thus, the reason for the divergence is the undisputed coincidence of high depletions and high usability in those years and not other alleged defects in the method proposed by Kansas.

[22] The Kansas model as used in this Brief is the Kansas Hydrologic-Institutional Model (H-I Model) used to quantify depletions at the state line as a result of post-Compact development in Colorado.

missioners charged with drafting the Compact. Rep., vol. I, at 78, 91. With the approval of the Colorado Attorney General and State Engineer, in February 1944, Mr. Patterson developed a quantitative method for determining usability based on the December 1943 decision of this Court. Jt. Ex. 8, at 23-24 (R. vol. 4, at 141, 142), *reprinted in* Rep., vol. II, at 292. Mr. Patterson's method was sensitive to daily variations in flow as recommended by this Court. *See id.* It limits usable flows to the instantaneous capacity of the Kansas ditches (2,000 cubic feet per second). *Id.* It also has volumetric limits for each month and for each season.[23] *Id.*

The Master's method[24] is based on calculations of average diversions as a percentage of stateline flows and average recharge over long periods of time, 36 years with respect to diversions (1950-85) and 23 years with respect to groundwater recharge (1925-48). *See* Rep., vol. II, at 293-95, 305. The Master's method assumes that 82% of all summer flows and 35% of all winter flows are usable either as surface diversions or as groundwater recharge. *See id.* These percentages are the same year after year from 1950 through 1985. Thus, a portion of the depletions (18% in the summer and 65% in the winter) is *always* considered to be unusable in Kansas regardless of actual conditions.

B. The Master's Averaging Method is Inconsistent with Article IV-D.

The proviso of Article IV-D of the Compact states as follows:

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[23] The percentage of flows determined to be usable each month under both Kansas' method and the Patterson method is given in Pl. Ex. 646 (R. vol. 89, at 62, 85, vol. 99, at 106), Pl. App., Item 4.

[24] In the Report the method proposed by Kansas for approval ultimately by the Court is referred to as the "Spronk Approach" (or "SWE Method"). The method adopted by the Master is referred to in the Report as the "Durbin Approach" (or "HCI method") with "the Larson Modifications." The method proposed by Colorado is referred to as the "Helton Approach." *See* Rep., vol. II, at 293-305.

> Provided, that the waters of the Arkansas River, as defined in Article III, *shall not be materially depleted in usable quantity or availability for use* to the water users in Colorado and Kansas under this Compact . . . . (Emphasis added.)

The plain meaning of the words emphasized above excludes the notion of averaging over multi-year periods and requires consideration of hydrologic variability as it affects supply and demand. The words "in usable quantity or availability" also echo the words of this Court in the 1943 decision in *Colorado v. Kansas*, 320 U.S. 383 at 396-97 as quoted in the Master's Report:

> "The Kansas ditches are capable of diverting water only up to 2,000 c.f.s. When the flow is greater the excess cannot be diverted and used. It is admitted that the character of the flow of the river in Colorado is variable from year to year, from season to season, and from day to day, and the main river below Canon City may be almost without water one day, run a flood the next day, and, on the following day, be in practically its original condition. Thus it appears that both in Colorado and in Kansas there may at one time be flood water unavailable for direct diversion and, at another, not enough water to supply the capacity of diversion ditches. *The critical matter is the amount of divertible flow at times when water is most needed for irrigation. Calculations of average annual flow, which include flood flows, are, therefore, not helpful in ascertaining the dependable supply of water usable for irrigation*". (Emphasis added.) Rep., vol. II, at 291-92 (emphasis in the Report).

Nor was the need to avoid averages to the maximum extent possible lost on the negotiators of the Compact, many of whom were involved in the Supreme Court case. As a result, Article II of the Compact specifically provides:

> The provisions of this Compact are based on . . . (2) the opinion of the United States Supreme Court entered December 6, 1943, in the case of *Colorado v. Kansas* (320 U.S. 383) concerning the relative rights of the respective States in and to the use of waters of the Arkansas River. . . .

The drafters of the Compact then proceeded to require that the waters of the Arkansas River not be "materially depleted in *usable quantity or availability*," emphasizing the need to observe the usability and availability of waters to the maximum extent possible in line with the insights of the 1943 Supreme Court opinion.

Thus, this Court and the compacting states have recognized the need to assess the usability of flows on a daily basis to the maximum extent possible. Long-term averages were considered "unhelpful" by this Court in 1943 and are inconsistent with Article IV-D of the Compact. And as the Master himself recognized, in parts of the Report other than that quoted above, usable flow averages are not acceptable under the Compact. *See* Rep., vol. I, at 52, vol. II, at 262.

While the Master obviously recognized the shortcomings involved in relying on averages in general, and the mandate from this Court and the Compact itself to avoid such reliance, he chose a method of analyzing usability that relies not just on averages, but long-term averages. The quotation from the opinion of the Court in *Colorado v. Kansas* makes clear that usability varies on a daily basis in the Arkansas River Valley. To accept the Master's approach is tantamount to reading the language "in usable quantity or availability" out of the Compact. Nevertheless, the Master recommended that the Kansas daily analysis of usability be rejected in favor of a method that assesses usability based on averages spanning decades.

The Master's method does not recognize daily variations in usability. *See* Rep., vol. II, at 293-95, 305. It does not even recognize monthly variations or even variations over a full season. *Id.* In fact, it assumes that every irrigation season is like every other irrigation season in the whole 36-year study period. *Id.* It also assumes that every winter season is exactly the same as every other winter season, allowing no variability from year to year, let alone day to day. *Id.* Kansas' method is the only method proposed to the Master which accounts for the kind of variability that was contemplated by the Supreme Court, by the Patterson method and by Article IV-D of the Compact. Further, compared to the Patterson method, Kansas' method is generally lower in its quantification of usability. In fact, the Patterson method yields higher usable flows than Kansas' method in most months. *See* Pl. Ex. 646 (R. vol. 89, at 62, 85, vol. 99, at 106), Pl. App., Item 4.

The Master suggested that Kansas' method produces the greatest amount of depletions of usable flow, by comparing it to the results of the method he ultimately adopted. *See* Rep., vol. II, at 302-03. But Kansas' method always yields lower usable flows than the Patterson method, which was proposed by Colorado shortly after the Supreme Court decision in *Colorado v. Kansas*, 320 U.S. 383 (1943).

C. Kansas' Daily Method is Consistent With Article IV-D.

Both Colorado and Kansas agree that depletions were generally highest during the late 1970s and early 1980s than at any other time during the 1950-85 study period. *See* R. vol. 127, at 120-21, 124, Pl. App., Item 28. The period of drought which occasioned the high pumping and therefore the high depletions of stateline flows also had the effect of increasing the usability of flows in Kansas dramatically. *Id.*, at 123-24. The chief Colorado expert agreed that the usability in Kansas was very high during the 1970s. *See* R. vol. 115 at 33, Pl. App., Item 26. The Kansas evidence for this period shows almost 100% usability. *See* Pl. Ex. 646 (R. vol. 89, at 62, 85, vol. 99, at 106), Pl. App., Item 4. This was the only evidence specifically addressing this period (1975-82). The Master's choice of an averaging method led him to exclude some 124,000 acre-feet of depletions to usable flow based on the numbers presented by Kansas. *See* Rep., vol. II, at 303. The telling point here is that the averaging method and Kansas' method matched quite closely over more normal hydrologic periods. *Id.* Pl. Ex. 698 (R. vol. 127, at 127, 146), Pl. App., Item 5. The only part of the 1950-85 study period in which the Master's method and Kansas' method differ significantly is the 1975-82 drought period, which is the only part of the study period where high depletions and high usability coincided.

D. The Master Incorrectly Rejected Kansas' Method Based on Unsubstantiated Criticisms.

In the initial part of the trial before the Master, Colorado criticized the usable flow method adopted by the Master because it depended on long-term averages. *See* R. vol. 53 at 143-46, 148-49, Pl. App., Item 21. Colorado's own method varied from month to month. *See* Rep., vol. II, at 296. But Colorado has now developed arguments in an effort to support the long-term averaging method it earlier debunked.

Despite the characteristics of Kansas' method, which make it the only method consistent with Article IV-D, namely its recognition of daily changes in usability, the Master has rejected Kansas' method based on several arguments by Colorado. *See* Rep., vol. II, at 302-05. The first argument raised by Colorado that the Master accepted is that the Kansas model, which calculates the basic depletions at the state line, is itself based on "average data." *Id.* at 302. First, the argument itself is incorrect.[25] Second, Kansas is limited to the data collected in Colorado, the same data which were relied upon by Colorado when the institutional changes

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[25] Although certain components of the Kansas model are based on averages, many important components, such as mainstem stream flows, are available and used in the model on a daily basis. R. vol. 54, at 122-23, 125, Pl. App., Item 22.

complained of by Kansas were initiated in Colorado. If the data are sufficient for Colorado to determine that those institutional changes can be undertaken without violating the Compact, that data should also be sufficient for analyzing compliance with the Compact after the fact. In other words, Colorado, not Kansas, should bear the risk of the lack of adequate (non-average) data, as explained more fully *supra* at 28-32. Moreover, the Colorado model is based just as much on average data as the Kansas model is, and Colorado had no hesitation applying its own usable flow method that varied on a monthly basis to the results of its model. Rep., vol. II, at 296. In addition, Colorado makes no claim that its model is more accurate than the Kansas model.

The Master impliedly criticized Kansas for proposing a method that gives a greater amount of depletion of usable flow than the method he chose. *See* Rep., vol. II, at 302-03. However, this is not generally true. The Master's statement is overbroad because it is only during the late 1970s and early 1980s, when high depletions coincided with high usability, that Kansas' method gives higher quantifications of depletions of usable flow than the method he chose. *See* Pl. Ex. 698 (R. vol. 127, at 127, 146), Pl. App., Item 5. In other periods, Kansas' method produces results that are very similar to those of the Master's averaging method. *Id.*

On the basis of arguments made by Colorado, the Master indicated that he believed that the Kansas usable flow method required the Kansas model to be "accurate" on a monthly basis. *See* Rep., vol. II, at 303. Although the Master adopted this factual assertion, Colorado never demonstrated any factual basis for it. The Master stated no factual basis (*see id.*), nor is Kansas aware of any. How uncertainty with regard to the calculated depletions at the state line makes more appropriate a method based on long-term averages is not explained. Several things are clear, however: (1) Any additional water that had come across the state line in the drought of the late 1970s would have been usable in Kansas for either diversion or groundwater recharge, R. vol. 127, at 123-24, 132-33, Pl. App., Item 28; (2) the Master's method does not recognize that fact, *id.*; and (3) as a result, the Master underestimated the usable depletions for the period 1975-82, *id.*

The question of which usable flow analysis to use is not a question of the accuracy of the Kansas model. Rather, it is a question of the accuracy of the respective usable flow methods, that is, whether it is appropriate to select a usable flow method that ignores the undisputed coincidence of high depletions and high usability in the late 1970s and early 1980s just because the model calculations have uncertainty associated with them. *Id.* Unfounded requirements of accuracy for the Kansas model should not be allowed to defeat a usable flow method which is otherwise the method most compatible with Article IV-D's requirement that the waters of the Arkansas River not be depleted in "usable quantity or availability."

The final objection that the Master suggested in opposition to Kansas' method is that "Colorado's experts also criticized the Spronk usable flow analysis because it did not factor out increased losses in the Arkansas River in Kansas due to increased well development in Kansas in the 1970s. To the extent that well development in Kansas may have increased the amount of streamflow going to groundwater recharge, the point is valid." Rep., vol. II, at 304 (citations omitted). Colorado never established that this concern actually caused the method to give unreasonable results. It is simply a possibility. In fact, Colorado's counterclaim based on the same allegation of increased pumping, was dismissed by the Master for the reason that Colorado had not proved its case. Order Granting Kansas' Motion to Dismiss Colorado's Well Counterclaim. Rep., vol. III, at 447. However, the Master accepted a known shortcoming with the averaging method, namely, the undisputed underestimation of usable depletions in the late 1970s and early 1980s, in order to avoid the possibility of a problem with the better method which Colorado has alleged but has not been able to prove.

The sufficient answer to all criticisms proposed by Colorado and adopted by the Master regarding the usable flow method proposed by Kansas is the fact that outside the critical period of

1975 through 1982 the two methods are essentially the same. Pl. Ex. 698 (R. vol. 127, at 127, 146), Pl. App., Item 5. If the Master's criticisms were valid, the differences between the methods would be more general and would be visible both before and after the critical period. On the contrary, however, the methods are almost identical before 1975 and after 1982. If there is a problem in using Kansas' method because of the alleged monthly inaccuracy of the Kansas model, that same problem would create a difference between the results of the two methods in periods of normal or more normal hydrology. Yet nothing of the sort appears. If effects of increased post-Compact pumping in Kansas were affecting the validity of Kansas' method, this would continue to be the case after the end of the critical period, namely, in the years 1983 through 1985. However, nothing of the sort appears. If the fact that the Kansas model must rely in part on average data were making the use of the Kansas usable flow method inappropriate, the alleged inappropriateness would manifest itself in divergences between the two methods both before and after the critical period. Again, nothing of the sort appears.

CONCLUSION

On the basis of the foregoing, Kansas requests the Court to (1) deny Colorado's Motion to Dismiss Kansas' Trinidad Reservoir Claim and remand the issue to the Master with instructions that the test of Compact compliance is to be compliance with the Trinidad Dam and Reservoir Project Operating Principles adopted by the Arkansas River Compact Administration; (2) accept Kansas' claim that operation of the Colorado Winter Water Storage Program has violated Article IV-D of the Arkansas River Compact, or, in the alternative, remand this issue to the Master for consideration of the effects of accretions on the claim; (3) accept the Kansas usable flow method for purposes of determining compliance with Article IV-D of the Arkansas River Compact; and (4) in all other respects to adopt the Report of the Master.

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APPENDIX

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Appendix Item 1

Table 1 From Pl. Ex. 30

Decreed and Permitted Well Data Base and Summaries — (Bent County, Prowers County, Pueblo County and Crowley/Otero Counties)

Table 1
From Pl. Ex. 30

Cumulative Number and Capacity of Irrigation Wells

1948-1985

	UPSTREAM OF JOHN MARTIN RESERVOIR		DOWNSTREAM OF JOHN MARTIN RESERVOIR	
YEAR	NUMBER	CAPACITY (CFS)	NUMBER	CAPACITY (CFS)
1948	792	866	57	128
1949	815	884	63	142
1950	864	935	77	181
1951	927	995	87	210
1952	962	1021	108	283
1953	1051	1126	137	380
1954	1162	1240	168	474
1955	1284	1386	201	564
1956	1331	1439	227	649
1957	1380	1504	248	707
1958	1388	1507	253	722
1959	1419	1528	260	741
1960	1475	1598	290	819
1961	1508	1628	310	880
1962	1522	1638	319	899
1963	1576	1697	416	1115
1964	1713	1846	527	1373
1965	1783	1930	594	1531
1966	1789	1932	609	1581
1967	1794	1939	623	1631
1968	1794	1939	642	1703
1969	1800	1950	653	1730
1970	1803	1952	661	1737
1971	1804	1953	667	1750
1972	1809	1956	678	1775
1973	1810	1957	686	1797
1974	1813	1961	693	1816
1975	1813	1961	701	1843
1976	1813	1961	721	1898

	UPSTREAM OF JOHN MARTIN RESERVOIR		DOWNSTREAM OF JOHN MARTIN RESERVOIR	
YEAR	NUMBER	CAPACITY (CFS)	NUMBER	CAPACITY (CFS)
1977	1816	1962	726	1909
1978	1816	1962	726	1909
1979	1816	1962	727	1914
1980	1816	1962	727	1914
1981	1816	1962	727	1914
1982	1816	1962	727	1914
1983	1816	1962	727	1914
1984	1816	1962	727	1914
1985	1816	1962	727	1914

LOCATION: PUEBLO, OTERO, CROWLEY, BENT AND PROWERS COUNTIES.
TOWNSHIP 20-24 SOUTH AND RANGE 41-65 WEST

SOURCE: DECREED AND PERMITTED WELL DATA BASE, SPRONK WATER ENGINEERS, INC.

FILE: WELLSUMM1.WK1

Appendix Item 2

Excerpt from Pl. Ex. 129

Report by Douglas R. Littlefield, Ph.D.,
"The History of the
Arkansas River Compact,"
August 1990

Volume II
Page 387

*****

. . . Third, the fundamental idea of maintaining the status quo was well understood by all concerned parties, including both states' negotiators, their constituent water users, and the Bureau of Reclamation.

*****

Appendix Item 3

Pl. Ex. 580

Trinidad Effects, 1979-84, Based on Bureau of Reclamation, Final Report on Review of Operating Principles, Trinidad Project, 1988

Pl. Ex. 580

TRINIDAD EFFECTS
(1000 Acre-feet)

YEAR	CASE I NET EFFECT ON JOHN MARTIN (Table 4 - Col. 3)	CASE I DEPLETION TO CONSERVATION STORAGE	CASE II NET EFFECT ON JOHN MARTIN	CASE II DEPLETION TO CONSERVATION STORAGE
1979	−3.1	−1.7	−4.0	−1.8
1980	−4.1	−11.1	−9.0	−17.5
1981	1.1	−2.8	−1.5	−2.3
1982	−1.8	−3.2	−5.4	−3.3
1983	4.3	−4.7	1.7	−2.0
1984	7.0	−1.0	6.6	−1.0
TOTAL	3.5	−24.5	−11.6	−27.5
AVERAGE	0.6	−4.1	−1.9	−4.5

Appendix Item 4

Pl. Ex. 646

Number of Days When Flow of the Arkansas River at the Stateline is All Used in Kansas (1949-1986)

NUMBER OF DAYS WHEN FLOW OF [illegible] ARKANSAS RIVER
AT THE STATELINE IS ALL U[illegible] KANSAS

COMPARISON OF C. L. PATTERSON'S DI[illegible]ON OF USABLE FLOW
AND THAT ACTUALLY USED BASED [illegible]SERVED FLOWS.

USGS WATER YEAR		OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	[illegible]L	AUG	SEP	OCT-MAR TOTAL	APR-SEP TOTAL	ANNUAL TOTAL	% OF TIME STATELINE FLOW IS ALL USED IN KANSAS		
																	OCT-MAR	APR-SEP	ANNUAL
1949	PATTERSON	8	26	27	26	0	0	30	31	[illegible]	31	21	10	87	142	229	48%	78%	63%
	ACTUAL	10	0	0	0	0	0	0	0	[illegible]	0	0	0	10	0	10	5%	0%	3%
1950	PATTERSON	13	25	31	28	0	0	30	31	[illegible]	31	31	18	97	170	267	53%	93%	73%
	ACTUAL	0	0	0	0	0	0	7	13	[illegible]	0	0	0	0	33	33	0%	18%	9%
1951	PATTERSON	23	25	27	26	0	0	30	25	[illegible]	31	31	8	101	151	252	55%	83%	69%
	ACTUAL	0	0	0	0	0	0	0	6	[illegible]	0	0	0	0	6	6	0%	3%	2%
1952	PATTERSON	19	23	28	26	0	0	30	31	[illegible]	31	31	30	96	183	279	52%	100%	76%
	ACTUAL	1	0	0	0	0	0	0	0	[illegible]	31	25	30	1	112	113	1%	61%	31%
1953	PATTERSON	31	30	31	31	28	31	30	31	[illegible]	31	30	30	182	182	364	100%	99%	100%
	ACTUAL	31	13	0	3	10	25	30	31	[illegible]	27	18	30	82	166	248	45%	91%	68%
1954	PATTERSON	31	30	31	31	28	31	30	31	[illegible]	30	25	30	182	176	358	100%	96%	98%
	ACTUAL	31	22	2	3	0	1	22	31	[illegible]	25	21	30	59	159	218	32%	87%	60%
1955	PATTERSON	31	30	31	31	28	31	30	29	[illegible]	31	28	30	182	178	360	100%	97%	99%
	ACTUAL	24	6	3	4	2	9	11	16	[illegible]	28	23	24	48	103	151	26%	56%	41%
1956	PATTERSON	31	30	31	31	29	31	30	31	[illegible]	30	30	30	183	181	364	100%	99%	99%
	ACTUAL	30	17	0	0	1	0	27	27	[illegible]	25	27	30	48	165	213	26%	90%	58%
1957	PATTERSON	31	30	31	31	28	31	30	29	[illegible]	30	23	10	182	152	334	100%	83%	92%
	ACTUAL	31	30	15	20	14	29	6	15	[illegible]	11	18	17	139	67	206	76%	37%	56%
1958	PATTERSON	14	30	31	31	28	1	30	30	[illegible]	30	31	30	135	181	316	74%	99%	87%
	ACTUAL	11	0	0	0	0	0	0	0	[illegible]	2	6	11	11	19	30	6%	10%	8%
1959	PATTERSON	19	30	31	31	8	0	30	31	[illegible]	31	29	10	119	161	280	65%	88%	77%
	ACTUAL	18	18	0	0	0	0	0	1	[illegible]	24	18	19	36	70	106	20%	38%	29%
1960	PATTERSON	16	28	31	31	4	0	30	31	[illegible]	31	31	30	110	183	293	60%	100%	80%
	ACTUAL	0	0	0	2	1	0	0	9	[illegible]	26	31	30	3	102	105	2%	56%	29%
1961	PATTERSON	31	30	31	31	28	31	30	31	[illegible]	31	31	30	182	182	364	100%	99%	100%
	ACTUAL	31	30	2	1	1	24	30	31	[illegible]	30	30	30	89	162	251	49%	89%	69%
1962	PATTERSON	20	30	31	31	15	0	30	30	[illegible]	31	31	30	127	182	309	70%	99%	85%
	ACTUAL	26	2	0	0	0	0	7	18	[illegible]	24	28	27	28	108	136	15%	59%	37%
1963	PATTERSON	31	30	31	31	28	31	30	31	[illegible]	31	31	30	182	183	365	100%	100%	100%
	ACTUAL	31	30	31	12	1	15	30	31	[illegible]	28	31	30	120	173	293	66%	95%	80%
1964	PATTERSON	31	30	31	31	29	31	30	29	[illegible]	31	31	30	183	181	364	100%	99%	99%
	ACTUAL	28	30	27	12	8	27	30	29	[illegible]	31	31	30	132	162	294	72%	89%	80%
1965	PATTERSON	31	30	31	31	28	31	30	31	[illegible]	20	3	0	182	104	286	100%	57%	78%
	ACTUAL	31	30	31	31	28	31	30	30	[illegible]	0	0	0	182	76	258	100%	42%	71%
1966	PATTERSON	23	22	22	16	0	0	30	31	[illegible]	31	6	0	83	126	209	46%	69%	57%
	ACTUAL	0	0	0	0	0	0	0	23	[illegible]	10	1	0	0	48	48	0%	26%	13%
1967	PATTERSON	21	30	31	31	28	8	30	30	[illegible]	31	12	0	149	133	282	82%	73%	77%
	ACTUAL	0	2	0	0	0	0	11	24	[illegible]	0	0	5	2	40	42	1%	22%	12%
1968	PATTERSON	12	30	31	31	20	0	30	31	[illegible]	31	31	30	124	183	307	68%	100%	84%
	ACTUAL	17	0	0	0	0	9	20	21	[illegible]	20	21	30	26	115	141	14%	63%	39%
1969	PATTERSON	31	30	31	31	28	31	30	30	[illegible]	31	31	29	182	181	363	100%	99%	99%
	ACTUAL	31	30	17	0	0	0	0	3	[illegible]	11	19	2	78	43	121	43%	23%	33%
1970	PATTERSON	29	30	31	31	18	0	30	31	[illegible]	31	31	30	139	183	322	76%	100%	88%
	ACTUAL	0	0	0	0	9	0	0	23	[illegible]	23	27	28	9	120	129	5%	66%	35%
1971	PATTERSON	29	30	31	31	10	0	30	31	[illegible]	31	31	30	131	183	314	72%	100%	86%
	ACTUAL	15	0	0	0	0	1	30	29	[illegible]	31	31	30	16	167	183	9%	91%	50%

PLAINTIFF'S EXHIBIT
646
Orig. No. 105

NUMBER OF DAYS WHEN FLOW O[illegible]RKANSAS RIVER
AT THE STATELINE IS ALL [illegible]KANSAS

COMPARISON OF C. L. PATTERSON'S [illegible]N OF USABLE FLOW
AND THAT ACTUALLY USED BASE[illegible]SERVED FLOWS.

USGS WATER YEAR		OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN		AUG	SEP	OCT-MAR TOTAL	APR-SEP TOTAL	ANNUAL TOTAL	% OF TIME STATELINE FLOW IS ALL USED IN KANSAS OCT-MAR	APR-SEP	ANNUAL
1972	PATTERSON	31	30	31	31	29	13	30	31	[illegible]	31	31	30	165	183	348	90%	100%	95%
	ACTUAL	31	30	31	29	28	31	30	31	[illegible]	31	23	7	180	152	332	98%	83%	91%
1973	PATTERSON	31	30	31	31	28	31	30	31	[illegible]	31	31	30	182	183	365	100%	100%	100%
	ACTUAL	31	4	4	3	0	0	0	0	[illegible]	31	31	30	42	103	145	23%	56%	40%
1974	PATTERSON	31	30	31	31	28	31	30	31	[illegible]	31	31	30	182	183	365	100%	100%	100%
	ACTUAL	31	30	31	14	0	0	11	28	[illegible]	31	31	30	106	161	267	58%	88%	73%
1975	PATTERSON	31	30	31	31	28	31	30	31	[illegible]	31	31	30	182	182	364	100%	99%	100%
	ACTUAL	31	30	31	31	28	18	27	26	[illegible]	19	31	30	169	147	316	93%	80%	87%
1976	PATTERSON	31	30	31	31	29	31	30	31	[illegible]	31	31	30	183	183	366	100%	100%	100%
	ACTUAL	31	30	31	31	29	31	30	31	[illegible]	31	31	30	183	183	366	100%	100%	100%
1977	PATTERSON	31	30	31	31	28	31	30	31	[illegible]	31	31	30	182	183	365	100%	100%	100%
	ACTUAL	31	30	31	31	28	31	30	31	[illegible]	31	31	30	182	183	365	100%	100%	100%
1978	PATTERSON	31	30	31	31	28	31	30	31	[illegible]	31	31	30	182	182	364	100%	99%	100%
	ACTUAL	31	30	31	31	28	31	30	31	[illegible]	31	31	30	182	181	363	100%	99%	99%
1979	PATTERSON	31	30	31	31	28	31	30	31	[illegible]	31	31	30	182	183	365	100%	100%	100%
	ACTUAL	31	30	31	31	28	31	30	31	[illegible]	31	31	30	182	183	365	100%	100%	100%
1980	PATTERSON	31	30	31	31	29	31	30	31	[illegible]	19	31	30	183	171	354	100%	93%	97%
	ACTUAL	31	30	31	31	29	31	30	31	[illegible]	31	12	30	183	164	347	100%	90%	95%
1981	PATTERSON	31	30	31	31	28	31	30	31	[illegible]	31	31	30	182	183	365	100%	100%	100%
	ACTUAL	31	30	31	17	0	23	30	31	[illegible]	31	31	30	132	183	315	73%	100%	86%
1982	PATTERSON	31	30	31	31	28	31	30	31	[illegible]	31	31	30	182	183	365	100%	100%	100%
	ACTUAL	31	30	31	31	28	31	30	31	[illegible]	31	31	30	182	183	365	100%	100%	100%
1983	PATTERSON	31	30	31	31	28	31	30	31	[illegible]	31	23	30	182	175	357	100%	96%	98%
	ACTUAL	31	30	31	1	20	31	21	31	[illegible]	31	31	30	144	174	318	79%	95%	87%
1984	PATTERSON	15	30	31	31	16	0	30	31	[illegible]	24	31	21	123	167	290	67%	91%	79%
	ACTUAL	31	30	31	19	7	25	14	22	[illegible]	28	30	30	143	154	297	78%	84%	81%
1985	PATTERSON	12	24	28	31	0	0	30	31	[illegible]	29	13	0	95	116	211	52%	63%	58%
	ACTUAL	18	0	0	0	0	3	23	6	[illegible]	29	14	7	21	79	100	12%	43%	27%
1986	PATTERSON	19	25	29															
	ACTUAL	0	0	0															
AVERAGES (W/O 1986)																			
	PATTERSON	26	29	30	30	21	18	30	31	[illegible]	30	28	24	154	171	325	85%	93%	89%
	ACTUAL	22	17	14	10	9	13	17	21	[illegible]	22	21	22	85	120	205	47%	66%	56%
MINIMUMS (W/O 1986)																			
	PATTERSON	8	22	22	16	0	0	30	25	[illegible]	19	3	0	83	104	209	46%	57%	57%
	ACTUAL	0	0	0	0	0	0	0	0	[illegible]	0	0	0	0	0	6	0%	0%	2%
MAXIMUMS (W/O 1986)																			
	PATTERSON	31	30	31	31	29	31	30	31	[illegible]	31	31	30	183	183	366	100%	100%	100%
	ACTUAL	31	30	31	31	29	31	30	31	[illegible]	31	31	30	183	183	366	100%	100%	100%

		OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN		AUG	SEP	NOV-MAR AVERAGE	APR-OCT AVERAGE
PERCENTAGE OF TIME ALL STATELINE FLOW IS USED IN KANSAS (W/O 1986)															
	PATTERSON	83%	97%	98%	97%	74%	59%	100%	99%	96	[illegible]7%	89%	80%	85%	92%
	ACTUAL	71%	56%	44%	34%	31%	43%	56%	67%	56	[illegible]2%	69%	73%	42%	66%
USABLE FLOW PERCENTAGES (PER HCI)															
	HCI	82%	35%	35%	35%	35%	35%	82%	82%	82	[illegible]2%	82%	82%	35%	82%

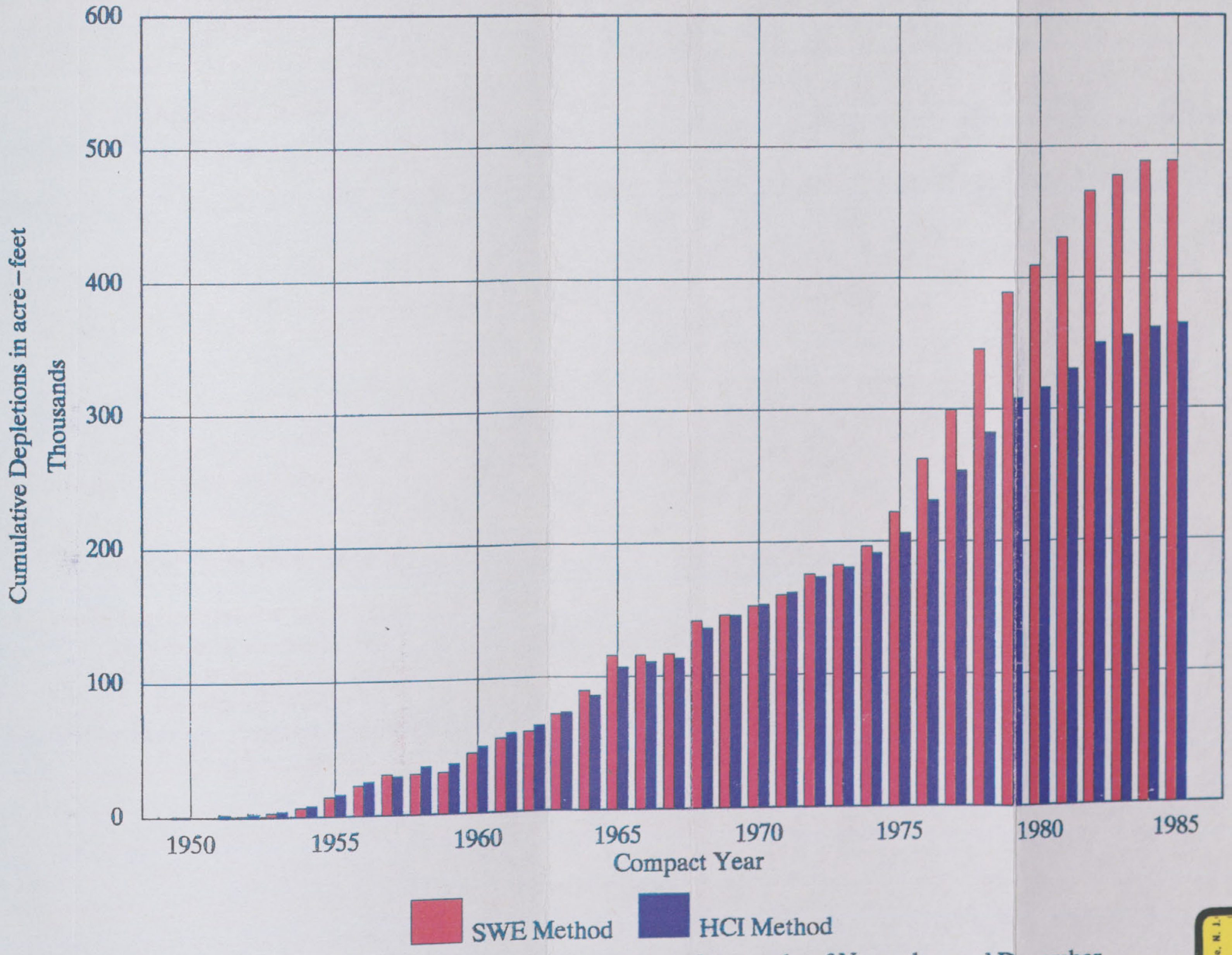
Appendix Item 5

Pl. Ex. 698

Usable Stateline Depletions, Combined Effects - SWE Method and HCI Method (Cumulative), 1950-1985

Usable Stateline Depletions

Combined Effects – SWE Method & HCI Method



Note: For compact year 1950, depletions were assumed to be zero for months of November and December.
Values shown are derived from Pl. Exhibits 560** and 647.

PLAINTIFF'S EXHIBIT 698 Case No. 105

Appendix Item 6

Excerpt from Def. Ex. 134*

Boyle Engineering Corporation and Tipton & Kalmbach, Inc., Arkansas River Basin Study, Results of Winter Water Storage Program Simulation (December 1990)

Columns (1) and (16) from Page 8.1, Def. Ex. 134*
POTENTIAL IMPACT OF WINTER WATER
STORAGE SIMULATION
** PASS #2 ** (ACRE-FEET)

*****

COMP YEAR (1)	— CHANGE IN STATE LINE FLOW — ANNUAL (16)
1950	230
1951	221
1952	148
1953	−137
1954	106
1955	63
1956	−101
1957	−233
1958	−281
1959	−162
1960	−217
1961	10
1962	105
1963	−57
1964	−103
1965	−350
1966	−393
1967	−540
1968	−919
1969	−1178
1970	−895
1971	−1259
1972	−1116
1973	−731
1974	−447
1975	−636
1978	−693
1950−75 & 78 AVG	−354

Notes:

(a) A positive value indicates an increase in river gain, diversion or storage as a net result of the simulation of the winter water storage program.

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PAGE 8.1

Appendix Item 7

Excerpt from Def. Ex. 1011

Changes in Stateline Flow
ADMIN.FOR (Dec. 1991 version and Feb. 24, 1992 version of RIGHT.DAT) and Modified HI Model (Sep. 1992)

CHANGES IN STATELINE FLOW
ADMIN.FOR (Dec. 1991 version and Feb. 24, 1992 version of RIGHT.DAT)
and Modified HI Model (Sep. 1992)

	INSTITUTIONAL CONDITIONS					TOTAL		SWE'S USABLE		HCI's USABLE (Helton's coeff.)	
COMP	OUR RUN	PUMP	WW	1980	TM	DEPLETIONS	DEPLETIONS& ACCRETIONS	DEPLETIONS	DEPLETIONS& ACCRETIONS	DEPLETIONS	DEPLETIONS& ACCRETIONS
							•••••				
4	D3	H	H	C	H	25,892	22,233	16,484	12,897	10,981	8,342
	D4	H	C	C	H	MODIFIED HI MODEL					
							•••••				

Appendix Item 8

Excerpt From Def. Ex. 1012

Changes in Stateline Flow, ADMIN.FOR (Dec. 1991 version and Feb. 24, 1992 version of RIGHT.DAT) and Winter Consumptive Use Modification to HI Model (Sep. 1992)

CHANGES IN STATELINE FLOW
ADMIN.FOR (Dec. 1991 version and Feb. 24, 1992 version of RIGHT.DAT)
and Winter Consumptive Use Modification to HI Model (Sep. 1992)

		INSTITUTIONAL CONDITIONS				TOTAL		SWE'S USABLE		HCI's USABLE (Helton's coeff.)	
COMP	OUR RUN	PUMP	WW	1980	TM	DEPLETIONS	DEPLETIONS& ACCRETIONS	DEPLETIONS	DEPLETIONS& ACCRETIONS	DEPLETIONS	DEPLETIONS& ACCRETIONS
						•••••					
4	N26	H	H	C	H	25,532	−29,462	16,454	199	7,012	−31,986
	N27	H	C	C	H	MODIFIED HI MODEL TO ALLOW WINTER PET TO VARY WITH IRR. APPLICATION RATE					

Appendix Item 9

Excerpt from Jt. Ex. 3

The Record of Meetings of the Colorado-Kansas Arkansas River Compact Commission

Mr. Dixon [Director of Branch of Project Planning, U.S. Bureau of Reclamation]

*****

My understanding in reading this, and the purpose of my question was—this says, "shall not be depleted in usable quantity or availability for use to the water users"—

Mr. Vidal [Commissioner for Colorado]

MR. VIDAL: Under this Compact.

MR. DIXON: Under this Compact, yes.

MR. VIDAL: We are trying to preserve a status quo.

MR. DIXON: I understand that. Of course, we are sympathetic to that objective.

*****

Appendix Item 10

Excerpt from Jt. Ex. 4

Transcripts of Meetings of the Colorado-Kansas Arkansas River Compact Commission From the Files of General Kramer in the National Archives

[Pages 54-55]

* * * * *

MR. VIDAL: * * * * * We are compacting about the present existing situation.

MR. KNAPP: That is right, we are compacting on the present condition. I am sure the Kansas Commissioners will want to be assured that the present conditions on the river will not be disturbed by the possibility of consumptive uses upstream.

* * * * *

Appendix Item 11

Excerpt from Jt. Ex. 18-32

Annual Reports of the Arkansas River Compact Administration From 1949 Through December, 1984

APPENDIX "C-3"

Resolution

CONCERNING
AN INVESTIGATION OF
TRINIDAD RESERVOIR OPERATIONS

WHEREAS, it has come to the attention of the Arkansas River Compact Administration that 18,290 acre-feet of water stored under the Model Reservoir water right in Trinidad Reservoir during compact year 1979 was transferred to the joint use pool on September 28, 1979 by action of the Board of Directors of the Purgatoire River Water Conservancy District without objection from the Divis[i]on Engineer for Division 2, Colorado Division of Water Resources; and

WHEREAS, an additional 20,000 acre-feet was stored in Trinidad Reservoir under the Model Reservoir right during compact year 1980; and

WHEREAS, the State of Kansas has questioned whether these actions are in conformity with the operating principles for Trinidad Reservoir;

NOW, THEREFORE, BE IT RESOLVED that pursuant to Article VIII, paragraph H of the Arkansas River Compact, the Compact Administration shall cause an investigation to be made of these circumstances; and

BE IT FURTHER RESOLVED that this investigation shall be accomplished on behalf of the Compact Administration by the Colorado Water Conservation Board and the Kansas Division of Water Resources, which entities shall conduct said investigation as promptly as possible and report their determinations to the Compact Administration as soon as possible after the adoption of this resolution.

Entered this 30th day of June, 1980, at a special meeting of the Compact Administration held in Lamar, Colorado.

/s/ Frank G. Cooley, Chairman
Arkansas River Compact
Administration

/s/ Leo Idler, Secretary
Arkansas River Compact
Administration

APPENDIX "C-4"

Resolution

CONCERNING TRINIDAD RESERVOIR

WHEREAS, the Arkansas River Compact Administration has made findings of fact relative to Trinidad Reservoir in Colorado, which findings were made at the special meeting of the Administration held in Lamar, Colorado, on September 25, 1980 (copy attached);

NOW THEREFORE, BE IT RESOLVED that the Administration goes on record as recognizing that the findings of fact made by the Administration have raised a question as to whether the waters of the Arkansas River have been materially depleted in usable quantity or availability for use to the water users in Colorado and Kansas; and

BE IT FURTHER RESOLVED that the Administration recommends that the Kansas State Engineer confer with the Colorado State Engineer to make further inquiries into this question as expeditiously as possible.

Entered this 25th day of September, 1980, at a special meeting of the Administration held in Lamar, Colorado.

/s/ Frank G. Cooley, Chairman
Arkans[s]as River Compact
Administration

/s/ Leo Idler, Secretary
Arkansas River Compact
Administration

Appendix Item 12

Excerpt from Jt. Ex. 19

Minutes of Meetings of the Arkansas River Compact Administration from 1949 Through December, 1984

MINUTES OF ARKANSAS RIVER COMPACT ADMINISTRATION SPECIAL MEETING

Court House
Lamar, Colorado
June 6, 1967

Attendance:

For Colorado:

Felix L. Sparks, Denver
Ernest Hofmeister, Lamar
George F. Reyher, McClave

For Kansas:

Robert V. Smrha, Topeka
Carl E. Bentrup, Deerfield
Logan N. Green, Garden City

For the United States:

Wilbur L. Heckler, Albuquerque, New Mexico

Others Attending:

G. D. Steward	Otero Co.	Rocky Ford, Colo.
Wayne Campbell	La Junta Chamber of Com.	La Junta, Colo.
Earl Beegles	Otero Co. Comm.	La Junta, Colo.
Everette Marshall	Catlin Ditch Board	La Junta, Colo.

Glenn G. Saunders	Purgatoire W.C. Dist.	Denver, Colo.
E. A. Thaxton	SECRA Chairman	Las Animas, Colo.
G. E. Kimble	Holbrook Lake Sptmns. Club	Swink, Colo.
Harry J. Figge	Colo. Game, Fish & Parks	Denver, Colo.
Robert A. Buchhagen	Corps of Engineers	John Martin Res.
Ross W. Moor	U.S.G.S.	Lamar, Colo.
Howard C. Corrigan	Div. of Water Res.	Garden City, Kans.
Leo J. Olson	C.F.I. Corp.	Pueblo, Colo.
Geo. T. O'Malley, Jr.	Colo. Game, Fish & Parks	Denver, Colo.
Bernie Bovee	Colo. Game, Fish & Parks	Colo. Spgs., Colo.
LeRoy Nickelson	Fort Bent	Lamar, Colo.
C. L. Nickelson	Fort Bent	Lamar, Colo.
Wm. Howland	Amity Mutual Canal	Holly, Colo.
Sisto Guidotti	Amity Mutual Canal	Bristol, Colo.
Carter Hutchinson	C.W.C.B.	Denver, Colo.
Harry C. Nevius	Amity Mutual Canal	Lamar, Colo.
W. T. Setchfield	Bent Co. Rec. Board	Las Animas, Colo.
James Donnelly	Chmn, Purgatoire W.C. Dist.	Trinidad, Colo.
Charles J. Cappellinni	Purgatoire W.C. Dist.	Trinidad, Colo.
Max Torres	Purgatoire W.C. Dist.	Trinidad, Colo.

J. L. Ogilvie	Bureau of Reclamation	Pueblo, Colo.
Ralph L. Strother	Corps of Engineers	Albuq., New Mexico
Leo J. Gamble	Bureau of Reclamation	Pueblo, Colo.
Edw. J. Tripp	U.S.G.S.	Denver, Colo.
Claire Behan	KLMR Radio	Lamar, Colo.
Donn Bynum	Tri-State Daily News	Lamar, Colo.
Clyde Albertson	Bent Co. Commissioners	Las Animas, Colo.
Frank Richards	Chamber of Commerce	Las Animas, Colo.
Dutch Schneider	Bowling Alley Owner	Las Animas, Colo.
Jack Robinson	City Council	Las Animas, Colo.
Fred L. Boydston	C.W.C.B.	Denver, Colo.
Francis M. Bell	C.W.C.B.	Denver, Colo.

MEETING CALLED TO ORDER

Chairman Heckler called the meeting to order at 9:55 A.M. He said that his first official duty was to present his credentials to the Administration. He next called for consideration of the minutes of the December 14, 1966 meeting. There being no corrections, the minutes were approved as submitted. The Chairman then read his report as follows:

REPORT

1. Appointment Credential—My appointment as federal representative to the Arkansas River Compact Administration was made by President Lyndon B. Johnson by letter of January 25, 1967. Copies of the appointment letter have been furnished to the commissioners of both States.

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OLD AND NEW BUSINESS

Mr. Heckler then asked if there was any unfinished business. There being none, he passed on to new business and suggested consideration of the Trinidad Project as the first item.

Mr. Sparks was asked to present the Trinidad Project for consideration. He said the project had been before the Administration for a long time and he asked if Kansas had any further questions on the project.

Mr. Smrha said that the revised operating principles had not been submitted to the Administration as such.

Mr. Sparks then submitted the revised operating principles along with a letter written to the ditch companies in Kansas. He said this material had been previously submitted to the State of Kansas. After some discussion Mr. Sparks said that these were the same principles that were submitted originally to the Administration and in addition contained the five points requested by the State of Kansas.

Mr. Bentrup said there seemed to be some conflict in Article VI whether there should be a ten-year review or a five-year review and Mr. Ogilvie was called upon to explain it.

Mr. Ogilvie said the amendments specify a five-year review shall be made instead of a ten.

After some discussion Mr. Saunders said that the amendments to the document supersede the original document.

Mr. Sparks said that in all documents such as this, the amendments supersede the original document.

Mr. Smrha then asked Mr. Ogilvie if the operating principles as amended had been sent to the ditch companies and if there had been any response to these.

Mr. Ogilvie said there had been no response from the ditch companies.

Mr. Sparks then asked if Kansas wanted anything further done with respect to the operating principles.

Mr. Smrha replied that if the question of approval was submitted to the Administration then Kansas will act.

Mr. Sparks then moved and Mr. Hofmeister seconded a motion that the Administration approve the operating principles with the understanding that the amendments take precedent over the original operating principles as presented.

Mr. Green said that he thought that it would be less clumsy to redraw the principles and incorporate the amendments into a single document. He said that as of now there were two documents to approve. He suggested that if everything were incorporated into one document then everyone would know what it means.

Mr. Sparks then asked Mr. Ogilvie to explain the operating principles and amendments.

Mr. Ogilvie said the amendments do take precedent over the original item and that the items included make one document. Mr. Ogilvie further said that at the first review the operating principles would be revised and amended as deemed necessary.

Mr. Smrha then asked for a recess of five minutes to which Mr. Heckler agreed.

Mr. Heckler reconvened the recessed meeting and Mr. Green said that the Kansas delegates had caucused and thought that if the letter of March 20, 1967, from H. P. Dugan to the Governor of Kansas and countersigned by the Purgatoire Conservancy District was referred to in an amended motion then Kansas could act upon that.

Mr. Sparks said that he would like to withdraw his original motion and make a new motion, which he did as follows:

Moved that the document of March 20, 1967 submitted to Governor Docking and signed by H. P. Dugan and countersigned by Dr. Donnelly be approved by the Arkansas River Compact Administration. Mr. Green seconded the motion and after some discussion the motion was carried by vote of the states. The documents are attached as Appendix A.

* * * * *

APPENDIX A

7-100

Hon. Robert Docking
Governor of Kansas
Topeka, Kansas

Dear Governor Docking:

On February 1, 1967, I concurred with views of the Kansas Water Resources Board and the State of Kansas relative to the Trinidad Project and the plan of operation as set forth in the "Operating Principles". At the same time, evidence of acceptance by the Purgatoire River Water Conservancy District of the five conditions set forth in Governor Avery's letter of December 30, 1966 was presented. Subsequent discussion with representatives of the Kansas Water Resources Board indicates the desirability of setting forth the "Operating Principles" and the five conditions clearly in one document so as to avoid any misunderstanding in the future as to their intent and purpose. I concur in this suggestion and, accordingly, quoted below are the "Operating Principles" as contained in the Irrigation Report on the Trinidad Project, Colorado, July 1964 (Revised September 1964) and the five conditions suggested in Governor Avery's letter of December 30, 1966:

OPERATING PRINCIPLES

TRINIDAD DAM AND RESERVOIR PROJECT

Preamble

The Trinidad Dam and Reservoir Project as reported in House Document No. 325, 84th Congress, 2d Session, and as authorized by the Flood Control Act of 1958, will be operated in such a manner as to secure the greatest practicable benefits from the regulation and use of the flows of the Purgatoire River consistent with the laws and policies of the State of Colorado and of the United States including the Arkansas River Compact. The objectives and principles governing the operation of the Trinidad Dam and Reservoir Project to secure such benefits are contained within the following articles.

Article I - OBJECTIVES
Article II - DEFINITION OF TERMS
Article III - FLOOD CONTROL
Article IV - IRRIGATION
Article V - FISHERY AND RECREATION
Article VI - REVIEW AND AMENDMENT

Article I—OBJECTIVES

The operation of the Trinidad Dam and Reservoir involves the regulation of the flows of the Purgatoire River for flood control, irrigation use, and recreation including a permanent fishery pool. The project plan provides for:

1. Control of floods originating above the reservoir for benefit of the city of Trinidad and downstream reaches.
2. Optimum beneficial use of the available water for irrigation within the project area consistent with the protection of downstream non-project rights as set forth in House Document No. 325, 84th Congress, 2d Session, which provides:
   (a) Transfer of the storage decree of the Model Land and Irrigation Company for 20,000 acre-feet annually from the present site to the proposed Trinidad Reservoir.
   (b) Storage in the Trinidad Reservoir of flood flows originating on the Purgatoire River above the dam site which would otherwise spill from John Martin Reservoir.
   (c) Storage in Trinidad Reservoir of the winter flows of the Purgatoire River historically diverted for winter irrigation of project lands.
3. The maintenance of a minimum pool for enhancement of recreation and fishery values.

4. The construction of the Trinidad Dam and Reservoir with the following allocated capacities:

Flood control	51,000 acre-feet
Irrigation	20,000 acre-feet
Permanent fishery pool	4,500 acre-feet
Joint use*	39,000 acre-feet
Total capacity	114,500 acre-feet

* For irrigation and sediment accumulation

Article II—DEFINITION OF TERMS

Definition of terms as used herein:

1. "Reservoir" means the reservoir presently planned and authorized for construction on the Purgatoire River above the city of Trinidad, Colorado.
2. "District" means the Purgatoire River Water Conservancy District, that entity created and existing under laws of the State of Colorado to contract for repayment to the United States of an appropriate share of the project costs allocated to the irrigation use. The District shall also be the agency responsible for the regulation of irrigation water supplies within the District boundaries in the manner set forth therein.
3. "Unused Sediment Capacity" means that portion of the 39,000 acre-feet of reservoir capacity allocated to joint use but unoccupied by sediment at any given time.
4. "Irrigation Capacity" means the 20,000 acre-feet of reservoir capacity allocated to irrigation plus the unsedimented portion of the joint use capacity.
5. "Permanent Fishery Pool Capacity" means the 4,500 acre-feet of reservoir capacity allocated to fishery and recreation.
6. "Permanent Fishery Pool" means the quantity of water stored in the permanent fishery pool capacity.
7. "Flood Control" means the temporary storage of flood waters at any reservoir pool level as necessary to alleviate flood damages through the city of Trinidad and downstream reaches.

8. "Flood Control Capacity" means the 51,000 acre-feet of capacity exclusively allocated to flood control lying initially above m.s.l. reservoir elevation 6229.6.
9. "Reservoir Inflow" is to be expressed in mean daily cubic feet per second of time and means that total flow of water entering the reservoir, comprising measured flows at the inflow gaging stations and other unmeasured inflows entering the reservoir, less such flow of water as may be acquired by the State of Colorado for filling and maintaining the permanent fishery pool.
10. "District Irrigable Area" means only the 19,717 acres of Class 1, 2 and 3 irrigable lands to be served lying within District boundaries.
11. "Irrigation Season" means that period of the year, as determined annually by the District, during which water may be beneficially applied to the District irrigable area, provided the irrigation season will not begin earlier than April 1 or end later than October 15, except as modified by the District with the consent of the Secretary of Interior.
12. "Nonirrigation Season" means that period of the year other than the irrigation season.
13. "District Storage Right" means those rights under which the District may store water in the irrigation capacity for use on the District irrigable area.
14. "District Water Supply" means that water supply of the Purgatoire River subject to District administration for irrigation use within the District irrigable area.
15. "Colorado State Engineer" means the Colorado State Engineer or such other administrative agency having jurisdiction and control over the distribution of the waters of the State of Colorado.
16. "Operating Agency" means the U.S. army Engineer District, Albuquerque, New Mexico, Corps of Engineers.

Article III—FLOOD CONTROL

Trinidad Reservoir shall be operated for flood control benefits in accordance with regulations prescribed by the Secretary of the Army and the following operating principles:

1. All potentially damaging flood inflows shall be temporarily detained as necessary to limit the flow insofar as possible to a nondamaging flow,currently estimated to be 5,000 c.f.s., downstream from the Trinidad Reservoir.
2. All flood waters stored in the flood control capacity shall be released at the maximum nondamaging rate insofar as practicable.
3. Any inflow, other than that stored for irrigation use, temporarily retained below the bottom of the flood control capacity for flood control purposes, shall be released by the operating agency at such a rate, time, and quantity as may be ordered by the Colorado State Engineer, but within nondamaging flow in the channels below the reservoir.

Article IV—IRRIGATION

Administration of the irrigation capacity in Trinidad Reservoir and the distribution of water to the District irrigable area will be made by the District in accordance with House Document No. 325, 84th Congress, 2d Session, and these operating principles. Agreements, satisfactory to the Secretary of the Interior, shall be entered into between the District and the ditch companies and other owners of affected water rights to insure that these principles and the operation described herein shall be adopted.

The principles and provisions under which the District will administer water supplies to the District irrigable area are contained in the following four parts of this Article: "Water Rights", "Limits of Land and Water Use", "District Water Supply", and "Operation and Exercise of Water Rights".

A. Water Rights

Accomplishment of the following conditions is necessary under the laws of the State of Colorado to provide the District with the right to regulate the flows of the Purgatoire River in the manner described herein:

1. The water users within the District shall assign the right to the exercise of all the decreed direct flow water rights within the District boundaries to the District for administration by the District at such times and to the degree outlined in these principles. The right to the exercise of the following water rights, all in water District No. 19, shall be so assigned.
2. Waters of the Purgatoire River shall be stored by the District in the irrigation capacity of Trinidad Reservoir under rights created under Colorado law; said rights, defined as the District storage right, include:
   (a) The Model storage right, being the right to store 20,000 acre-feet of water from the flows of the Purgatoire River, under reservoir priority No. 10 in Water District No. 19 at a rate of flow not exceeding 700 cubic feet per second of time under date of appropriation of January 22, 1908, as decreed by the District Court of Las Animas County, Colorado, on January 12, 1925, which right shall, by appropriate statutory proceedings be transferred from the place of storage as originally decreed to the site of the reservoir; and
   (b) Such other rights to store water in the reservoir as the District may lawfully acquire by appropriation or purchase.

Priority		Amount	
Number	Date	(cfs)	Name of Ditch
3	11/30/61	6.00	Baca
5	3/20/62	4.00	Johns Flood
7	4/30/62	7.00	Chilili
8	11/15/62	2.82	Baca
8	11/15/62	1.18	El Moro
9	1/1/63	1.28	Johns Flood
9	1/1/63	4.72	Hoehne

12	6/30/63	0.50	South Side
13	1/1/64	1.25	Johns Flood
13	1/1/64	3.75	Lewelling & McCormick
15	4/10/64	5.10	Johns Flood
15	4/10/64	0.80	Hoehne
15	4/10/64	2.54	Salas
19	6/1/65	4.00	Lewelling & McCormick
20	10/7/65	7.35	Johns Flood
20	10/7/65	16.65	Hoehne
21	1/1/66	6.00	Burns & Duncan
22	2/1/66	4.00	Salas
27	5/31/66	2.25	Johns Flood
27	5/31/66	2.25	Salas
40	4/30/68	1.40	South Side
64	4/1/73	2.40	Johns Flood
73	11/1/75	6.00	South Side
74	2/17/76	34.00	South Side
75	12/25/76	4.00	South Side
77	3/11/77	1.30	El Moro
77	3/11/77	2.70	Baca
80	4/7/77	18.60	South Side
93	12/15/82	4.00	South Side
95	11/4/83	14.38	Baca
96	11/23/83	16.84	South Side
98	4/30/84	60.00	South Side
103	6/21/86	14.73	Baca
104	10/21/86	10.00	Lewelling & McCormick
106	3/12/87	15.00	Baca
108	2/15/88	9.70	South Side
109	3/1/88	8.00	South Side
137	11/23/97	2.00	V. Florez
145	10/20/02	100.00	Johns Flood
152	12/31/03	2.00	V. Florez
168	1/22/08	200.00	Model
242½	6/12/20	45.56	Baca

B. Limits of Land and Water Use

In order that the Trinidad Dam and Reservoir Project may provide an optimum beneficial use of water for irrigation within the District, the following limitations on land and water use shall apply:

1. The acreage irrigated by the District water supply shall be limited to the 19,717 acres classified as 1, 2 and 3 irrigable land lying within the District boundaries. These 19,717 acres of the District irrigable area shall be composed as nearly as practicable of the following acreages under individual ditches:

Baca	2,428	acres
Chilili	114	"
El Moro	160	"
Johns Flood	1,854	"
Model	6,177	"
South Side	6,359	"
Victor Florez	22	"
Hoehne	1,742	"
Burns & Duncan	322	"
Lewelling & McCormick	378	"
Salas	161	"
Total	19,717acres	

2. All water deliveries to the 19,717 acres of the District irrigable area will be limited during the irrigation season to the irrigation requirements at the farm headgate as determined by the District. Allowance for canal and lateral losses on the individual ditch systems will also be determined by the District.
3. No water deliveries for irrigation of the 19,717 acres of the District irrigable area will be made during the non-irrigation season.

C. District Water Supply

1. That water supply of the Purgatoire River subject to District administration for irrigation use within the District irrigable area, defined as the District water supply, consists of:
   (a) The water stored under the District storage right in the irrigation capacity.
   (b) The stream gains to the Purgatoire River below Trinidad Dam that are divertible to the District irrigable area for irrigation use through the District's exercise of the rights listed in IV.A.1.
   (c) That portion of the reservoir inflow bypassed to the river below Trinidad Dam which is subject to diversion to the District irrigable area through the District's exercise of the water rights listed in IV.A.1.
2. The District water supply will be allocated by the District to the ditches within the District to provide each acre of the District irrigable area an equitable share of the District water supply after allowance has been made for individual ditch transportation losses, provided such allocation will not exceed the irrigation requirements at the farm headgate.

D. Operation and Exercise of Water Rights

The principles governing operation of the irrigation capacity and the District's exercise of the assigned direct flow water rights listed under IV.A.1. and the District storage right are hereinafter set forth as they apply to operations during the entire year as well as to operations during either the non-irrigation season or irrigation season.

1. Non-interference with Downstream Water Rights
   (a) Bypasses to the river shall be made at any time during the year to satisfy downstream senior rights as ordered by the Colorado State Engineer to the extent that such demands are not met by stream gains or otherwise satisfied but are limited to the extent as determined by the Colorado State Engineer to actually

benefit such rights without unnecessary waste through channel losses.

(b) Reservoir inflow in excess of the amount stored under the transferred Model right may be detained in the reservoir at such times as John Martin Reservoir is reasonably expected to spill; to the extent that John Martin Reservoir would have spilled, such detained water shall be considered to have been stored under the District storage right and become part of the District water supply. Such detained water which does not become a part of the District water supply shall be released as called for by the Colorado State Engineer in the amounts and at such times as he shall determine that such releases may be required to avoid a material depletion of the water of the Arkansas River as defined in Article 3 of the Arkansas River Compact, C.R.S., 1953, 148-9-1.

(c) Except as provided by paragraph (b) above, any water temporarily detained in the reservoir as a result of the reservoir inflow exceeding the design outlet capacity of the reservoir shall be released as soon as possible.

(d) All releases from the reservoir, as set forth in (a), (b) and (c) above, shall be passed down the Purgatoire River without interference by water users in the District irrigable area.

2. District Operation, Non-irrigation Season

(a) During the non-irrigation season the District will provide an allowance for stock watering purposes of not more than a daily mean flow of five second-feet or its volume equivalent measured at a gage to be located near and above the Baca River headgate. If the stream gains from the Trinidad Dam to the said gage are insufficient to fulfill the allowance, an equivalent volume of reservoir inflow will be released to satisfy stock water demands within the allowance.

(b) During the non-irrigation season the District will exercise the direct flow water rights and the District storage right only at such times and to the degree as necessary to assure:

(1) That the maximum possible storage of reservoir inflow is accrued.

(2) The stock water allowance is distributed in a manner determined equitable by the District.

3. District Operation—Irrigation Season

(a) During the irrigation season, except at such times as provided for in IV.D.3.(c) below, the District shall exercise the direct flow water rights and the District storage right only at such times and to the degree necessary to assure:

(1) That stream gains to the river below Trinidad Dam which are divertible to the District irrigable area and such reservoir inflow which is bypassed to the river for District irrigation use will be equitably distributed to the District irrigable area as part of the allocated District water supply.

(2) That the District storage right can be fully exercised to store reservoir inflow in excess of that bypass to the river as may be required under D.1.(a) and D.3.(a)(1) above.

(b) During the irrigation season water stored in the irrigation capacity will be released as needed to fulfill or partially fulfill the irrigation requirements of the District irrigable area as part of the allocated District water supply.

(c) During the irrigation season, when the irrigation capacity is empty as determined by the District, the District will relinquish its exercise of the direct flow water rights provided that if the reservoir inflow and stream gains below Trinidad Dam which are divertible to the District irrigable area exceed the irrigation requirement and such excess is storable under the District storage right, the District will resume the exercise of the direct flow rights and exercise of the District storage right as in D.3.(a)(2) above.

4. Evaporation and Seepage Losses

   In the accounting for water in storage, evaporation and seepage losses due to water stored in the irrigation capacity shall be determined using the most recent data available by the Colorado State Engineer and the District with the cooperation of the operating agency.

Article V—FISHERY AND RECREATION

The permanent fishery pool shall be operated in accordance with the following principles:

1. Water for the initial and subsequent fillings and for replacing evaporation and seepage losses will be acquired by the State of Colorado without interference to the District water supply or without additional cost to the District or the United States for the Trinidad Project as envisioned in House Document No.325.
2. In the accounting for water in storage, evaporation and seepage losses due to the permanent fishery pool shall be determined using the most recent data available by the Colorado State Engineer and the District with the cooperation of the operating agency.
3. There shall never be any release of water from the permanent fishery pool except upon the request of the Colorado Game, Fish, and Parks Commission to the Colorado State Engineer.

Article VI—REVIEW AND AMENDMENT

These operating principles may be subject to review and amendment not more than once a year at the request of any of the parties' signatory; provided, that at least one review shall be accomplished within the first 10 years following completion of the Trinidad Dam and at least one review be accomplished every 10 years thereafter. The primary object of such reviews will be obtaining optimum beneficial use of water as conditions change, operating experience is gained, and more technical data become available.

FIVE CONDITIONS

State of Kansas

1. All inflows over established Colorado water rights (1156.05 cfs) be designated flood flows and released as promptly as downstream conditions permit. The only time water so designated may be stored in the conservation pool will be when John Martin Reservoir does not have the capacity to store additional water.

2. Any subsequent amendment of the operating principles should be subject to review and approval of the same interests as provided for in the original procedure.

3. Assurances that there will be no significant increase in water use which would result in a depletion of water yield to other Colorado and Kansas water users.

4. That 5 years after beginning operation of the Trinidad Reservoir for irrigation purposes, the operating principles be reviewed to determine the effect, if any, the operation has had on other Colorado and Kansas water users and the principles amended as necessary. Each 10 years thereafter reviews should be provided with amendments as needed.

5. All operating records be open for inspection by any qualified representative of the Arkansas River Compact Administration.

The Bureau of Reclamation concurs fully with the "Operating Principles" as set forth above and further agrees with the five conditions noted and suggested by the State of Kansas, also stated above.

To further assure acceptance and complete understanding of the "Operating Principles" and the five conditions, both set forth herein, and consistent with the resolution of the Purgatoire River Water Conservancy District, Dr. James E. Donnelly, President of the District, is joining the Bureau of Reclamation in this letter and so indicates by his signature, approving in its entirety the material set forth herein. Authority for Dr. Donnelly's approval is contained in a resolution passed by the Purgatoire River Water Conservancy District on January 26, 1967 and a copy of this resolution and Dr. James E. Donnelly's letter of January 26, 1967 is attached for your ready reference.

I am sure this adequately documents the intent and purpose of complying with the provisions set forth herein by the parties concerned and I would appreciate early advice from you of the State of Kansas' approval of this action.

Sincerely yours,

/s/ H.P. Dugan

H.P. Dugan
Director

PURGATOIRE RIVER WATER
CONSERVANCY DISTRICT
By: /s/ James E. Donnelly
James E. Donnely, President

Enclosures

cc:
Commissioner, Attention: 400 (with enclosures)
Project Manager, Pueblo, Colorado, Attention: P-100 (with enclosures)

Appendix Item 13

Excerpts from Jt. Ex. 23

Final Report by the U.S. Bureau of Reclamation on the Review of Operating Principles, Trinidad Project, Colorado (December 1988)

Table 4

TRINIDAD PROJECT
EFFECTS ON THE INFLOW TO JOHN MARTIN RESERVOIR
CAUSED BY THE TRANSFER OF WATER OUT OF
THE MODEL STORAGE RIGHT AND THE STORAGE
OF WINTER WATER UNDER THE
DIRECT FLOW RIGHTS—1979-1984.

CASE #/YR			NET EFFECT ON J.M. RES. INFLOW
*****	*****	*****	*****
CASE #3			
(1HAD/79-84NS)			
1979			−4.0
1980			−9.0
1981			−1.5
1982	*****	*****	−5.4
1983			1.7
1984			6.6
TOTAL			−11.6
AVERAGE			−1.9

(Rev. 12/27/88)

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From a standpoint of injury to downstream users, Case 1 gives the most reasonable results. However, none of the three studies gives a true picture of injury because they do not compare the actual condition to a "without project" condition. We investigated making the "without project" comparison and concluded that there was not sufficient information available to make meaningful comparisons.

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[Pages 28-29]

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The array of studies run on the 1925-57 period show the impacts of the practices of transferring water out of the Model Right and storing winter water under the direct flow rights. The studies also show the impacts of various levels of over irrigation, project operation with a 39,000 acre-foot joint-use pool (instead of the 19,500 acre-foot pool used in the 1961-64 studies) and several levels of bypass to Ninemile and Highland. The studies show the impacts of individual practices and conditions and various combinations of practices and conditions. A description of the various studies was displayed earlier in this section on pages 17 through 20, and the results are shown in Table 5 and Table 6. Tables 5 and 6 show that under most of the practices and conditions studied, the inflow to John Martin Reservoir is larger than that which would have occurred without the Project. The increase of inflow is smaller, however, than would occur if the Project were operated as assumed in the 1961-64 studies.

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[Page 55]

V. <u>CONCLUSIONS</u>

A. The transfer of water from the model storage right to the joint-use pool is a departure from the intent of the Operating Principles.

B. The storage of winter water under the direct flow rights is also a departure from the intent of the Operating Principles.

C. The transfer of water from the Model Right and the storage of winter water under the direct flow rights during the 1979-84 review period has depleted the usable inflow to John Martin Reservoir when compared to the inflow that would have occurred had the Trinidad Project been in accordance with the intent of the Operating Principles.

D. The transfer of water from the Model Right and the storage of winter water under the direct flow decrees, either singularly or collectively, will not cause the future usable inflow to John Martin Reservoir to be less with Trinidad Project in operation than it would have been without the Project. These practices will, however, result in less inflow to John Martin Reservoir than would occur if the water rights were administered in accordance with the intent of the Operating Principles.

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Appendix Item 14

Excerpt from Jt. Ex. 34
House Document No. 325, 84th Cong.
2d Sess. (1956)

House Document No. 325, 84th Cong. 2d. Sess. (1956)
[Pages 3-4]

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The district engineer presents as the most suitable plan one providing for a dam and reservoir on the main stem of Purgatoire River at mile 161. The total storage capacity would be 140,700 acre-feet, of which 46,700 is allotted to flood control, 55,000 to conservation, and 39,000 to sediment control. He has coordinated the irrigation aspects of the plan with the Bureau of Reclamation. To obtain maximum beneficial use of the irrigation storage the Bureau of Reclamation suggests five basic operating conditions as follows:

(a) Transfer of the storage decree of the Model Land & Irrigation Co., for 20,000 acre-feet annually, from the present site to the proposed Trinidad Reservoir.

(b) Storage in Trinidad Reservoir of flood flows originating on Purgatoire River above the dam site which would otherwise spill from John Martin Reservoir.

(c) Storage in Trinidad Reservoir of the winter flows of Purgatoire River historically diverted for winter irrigation of project lands.

(d) Regulation in Trinidad Reservoir of summer flows historically diverted to project lands provided that future streamflow records disclose such further regulation would not materially decrease depletions or that any material increase in depletions be compensated by suitable replacement to lands served by John Martin Reservoir.

(e) Storage in Trinidad Reservoir of all flood flows originating on Purgatoire River above the reservoir other than those specified in condition *(b)*, provided that suitable replacement is made to John Martin Reservoir to the extent that such storage in Trinidad Reservoir would result in material depletion of the inflow from

Purgatoire River into John Martin Reservoir and interfere with its operation as established by the Arkansas River compact. The district engineer states that operation of the irrigation capacity in accordance with conditions *(a)*, *(b)*, and *(c)* can be accomplished under existing Colorado law and the Arkansas River compact and will not significantly deplete the water supply presently available to water users downstream from the project area. He further states that the effects of the operation of the conservation capacity in accordance with conditions *(d)* and *(e)*, on the utilization of John Martin Reservoir for irrigation under the terms of Arkansas River compact are indeterminate from existing streamflow records.

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[Page 29]

97. Operation of the irrigation pool in the Trinidad Reservoir in accordance with the above conditions would require the complete cooperation of all water users in the project area, and the negotiation of suitable agreements and contracts to permit an equitable distribution of the project waters to the entire irrigated area in accordance with the crop requirements. Suitable arrangements may also have to be made with the water users served by the John Martin Reservoir under the terms of the Arkansas River compact if operation of the Trinidad project is to be accomplished under conditions *(d)* and *(e)* above.

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[Page 40]

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144. The chairman, and representative of the United States, Arkansas River Compact Administration, stated that additional supporting data would be needed to substantiate the conclusions

reached in the report before he deemed it advisable to submit specific comments and recommendations for official action by the administration.

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Appendix Item 15

Excerpt from Jt. Ex. 35

Flood Control Act of 1958, 72 Stat. 297

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Arkansas River Basin

The project for the Trinidad Dam on Purgatoire River, Colorado, is hereby authorized substantially in accordance with the recommendations of the Chief of Engineers in House Document Numbered 325, Eighty-fourth Congress, at an estimated cost of $16,628,000.

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Appendix Item 16

Jt. Ex. 44

Letter dated February 1, 1967, from H.P. Dugan, Director, Region 7, U.S. Bureau of Reclamation, to Governor Robert Docking of Kansas

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
REGIONAL OFFICE, REGION 7
BUILDING 20, DENVER FEDERAL CENTER
DENVER, COLORADO 80225

IN REPLY
REFER TO: 7-440

Hon. Robert Docking
Governor of Kansas
Topeka, Kansas

FEB 1- 1967

Dear Governor Docking:

This is in reply to former Governor Avery's letter of December 30, 1966, to us concerning the operation of the proposed Trinidad Reservoir Project on the Purgatoire River near Trinidad, Colorado.

We are pleased to learn that the Kansas Water Resources Board, on the basis of our report on the irrigation function of the proposed Trinidad Project and additional information furnished by our representatives, has concluded essentially that the proposed Trinidad Project will not materially deplete the water supply of the Purgatoire River and John Martin Reservoir providing the project is operated in strict conformity with the guidelines used in the Trinidad Project investigations and the "Operating Principles" contained in the Bureau's Trinidad Irrigation Report.

We wish to assure you that the Bureau of Reclamation in its planning investigations for the proposed Trinidad Project and in developing the "Operating Principles" therefor has been fully aware of and has diligently and conscientiously endeavored to implement the provisions of the Arkansas River Compact so that the interests of the State of Kansas at all times will be fully protected consistent with the provisions of the Arkansas River Compact.

We appreciate the concern of the State of Kansas with the possibility that the Trinidad Project in its actual operation might have an adverse effect on Kansas and that provision should be made for timely adjustment of Trinidad Project operations to promptly eliminate any such adverse effects, should they occur. This legitimate concern is reflected in the five conditions set forth in former Governor Avery's letter with regard to future review and amendment, if necessary, of the "Operating Principles."

We have discussed this matter with the Board of Directors of the Purgatoire River Water Conservancy District. The Board is unanimous in its resolve that the five conditions in Governor Avery's letter are consistent with the Board's understanding of the "Operating Principles" and the manner of operation of the project as contemplated by the Board, and, further, that the Board approves those conditions to become operable when approved by the Regional Director, Bureau of Reclamation. A certified copy of the Board's January 27, 1967 resolution to that effect and a copy of District President James E. Donnelly's letter to us on this matter are enclosed.

The Bureau of Reclamation concurs fully in the enclosed resolution of the Board of Directors of the Purgatoire River Water Conservancy District and will be governed accordingly in implementing the "Operating Principles."

It would be greatly appreciated if your approval of the Trinidad Project can be received at an early date.

Sincerely yours,

H. P. Dugan
Director

Enclosures 2

Appendix Item 17

Jt. Ex. 45

Letter dated April 11, 1967, from Governor Robert Docking of Kansas to H.P. Dugan, Director, Region 7, U.S. Bureau of Reclamation

A-91

STATE OF KANSAS

OFFICE OF THE GOVERNOR

STATE CAPITOL BUILDING
TOPEKA, KANSAS

ROBERT B. DOCKING
GOVERNOR

April 11, 1967

Mr. H. P. Dugan
Bureau of Reclamation
Regional Office — Region 7
Building 46 — Federal Center
Denver, Colorado

Dear Mr. Dugan:

This will acknowledge receipt of your letters of February 1, 1967, and of March 20, 1967, and the Resolution from the Purgatoire River Water Conservancy District, Colorado.

I appreciate the consideration given by the Bureau of Reclamation and the Purgatoire River Water Conservancy District to the concern of the State of Kansas that the operation of the proposed Trinidad Project not adversely affect the volume of water flowing into John Martin Reservoir.

The resolution of the Purgatoire River Conservancy District dated January 26, 1967, together with the statement of the amended operating principles as contained in your letter of March 20, 1967, have been reviewed and found acceptable.

I, therefore, signify my approval of the amended operating principles referred to above, and offer no objection to the Trinidad Project being completed subject to the acceptance of the amended principles by the Arkansas River Compact Administration.

Sincerely,

Robert B. Docking
Governor

RBD:bj

cc: Mr. R. V. Smrha
Mr. Carl E. Bentrup
Mr. Logan N. Green
Mr. Felix L. Sparks
Mr. George F. Reyher
Mr. Ernest Hofmeister
Mr. Wilbur L. Heckler
Kansas Water Resources Board

Appendix Item 18

Excerpt from Jt. Ex. 99

U.S. Army Corps of Engineers, 1978, revised 1985, Water Control Manual, Trinidad Lake

[Page 1-2]

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1-06. Regulating agencies. The operating principles for Trinidad Dam and Reservoir have been mutually agreed upon by the Corps of Engineers, Bureau of Reclamation, State of Colorado, Arkansas River Compact Administration, and the Purgatoire River Water Conservancy District. The project will be operated in such a manner as to secure the greatest practicable benefits from flood control, irrigation and recreation.

Appendix Item 19

Excerpt from R. vol. 15

October 18, 1990

(Direct Examination of Brent Spronk)

[Pages 132-34]

*****

SPECIAL MASTER: MR. SPRONK, I TAKE IT THAT THE EFFORT TO INTEGRATE WELLS INTO THE SURFACE WATER SYSTEM COULDN'T BE DONE ON AN ABSOLUTE PRIORITY KIND OF BASIS, COULD IT? IT WAS NOT DONE THAT WAY? WHAT IS GOING THROUGH MY MIND IS, WE LOOKED AT EXHIBITS EARLIER THAT INDICATED THAT IF YOU DIDN'T HAVE A PRIORITY BY 1890 OR SO, YOU WOULD BE OUT OF LUCK A GREAT DEAL OF THE TIME. OBVIOUSLY, ALL OF THE WELLS ARE GOING TO HAVE A MUCH LATER PRIORITY IF YOU ENFORCE THAT SYSTEM STRICTLY.

THE WITNESS: THAT'S A DILEMMA THAT COLORADO FOUND ITSELF IN, YOUR HONOR, TRYING TO FIT A SQUARE PEG IN A ROUND HOLE.

SPECIAL MASTER: WITHOUT GETTING INTO ANY LEGAL INTERPRETATIONS, WHAT DOES THE STATE ENGINEER DO, WHAT EXACTLY?

THE WITNESS: THE STATE ENGINEER ATTEMPTED TO ENACT RULES AND REGULATIONS AND ATTEMPTED TO, OVER TIME, CURTAIL OR REGULATE THE USAGE OF WELLS, THE THEN EXISTING WELLS, SO AS TO CURTAIL THEIR PUMPING AND CUT IT OFF OVER A PERIOD OF TIME. HE ULTIMATELY WAS NOT SUCCESSFUL IN WHOLE, BUT IN PART, IN THAT REGARD IN TERMS OF CURTAILING WELLS. THERE IS SOME EXCEPTIONS TO ALL OF WHAT I'M SAYING, HOWEVER, THOUGH, BEAR IN MIND.

SPECIAL MASTER: HE DID WHAT I WAS SUGGESTING, THAT THERE HAD TO BE SOME MODIFIED APPROACH TO THIS OR IT SEEMED TO ME THAT COLORADO'S PRODUCTION WOULD HAVE BASICALLY BEEN HALTED.

THE WITNESS: THERE WERE ATTEMPTS BY THE STATE ENGINEER TO ENACT, AS IS SAID, RULES AND REGULATIONS. THE ULTIMATE BOTTOM LINE, HOWEVER, YOUR HONOR, IS THAT THE WELLS CONTINUE — THAT WERE IN EXISTENCE CONTINUE TO OPERATE MORE OR LESS AS THEY DID BEFORE WITH VERY LITTLE, IF ANY, ACTUAL REPLACEMENT PROVIDED TO MAKE UP THE DEPLETIONS THAT WERE OCCURRING EVEN AS OF 1969 OR TODAY.

SPECIAL MASTER: NOW, THAT'S YOUR OPINION AS TO HOW WELLS ARE OPERATING TODAY.

THE WITNESS: THAT'S CORRECT, YOUR HONOR.

SPECIAL MASTER: SO YOUR OPINION IS THAT THEY'RE OPERATING BY AND LARGE WITHOUT LIMITATION —

THE WITNESS: THERE ARE SOME RULES AND REGULATIONS, BUT THEY OPERATE BY — BUT EFFECTIVELY THE IMPLEMENTATION OF THOSE RULES AND REGULATIONS ALONG WITH THE WRITTEN PLANS THAT THERE ARE EXCEPTIONS TO THE RULES AND REGULATIONS TO ALLOW THE WELLS TO BASICALLY OPERATE AS THEY WERE BEFORE THE 1969 ACT WITH AN EXCEPTION OF A SMALL AMOUNT OF REPLACEMENT WATER THAT THEY HAVE PROVIDED TO THE STREAM IN TERMS OF TRANSMOUNTAIN RETURN FLOWS.

SPECIAL MASTER: ALL RIGHT.

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Appendix Item 20

Excerpts from R. vol. 18

October 23, 1990

(Direct Examination of Brent Spronk)

[Pages 9-10]

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AFTER REVIEWING THE DOCUMENTS REGARDING THE BACKGROUND AND DEVELOPMENT OF THE TRINIDAD PROJECT, IT WAS CONCLUDED THAT THE CURRENT AND PAST OPERATION OF THE PROJECT IS NOT IN ACCORDANCE WITH THE OPERATING PRINCIPLES OF THE TRINIDAD DAM AND RESERVOIR PROJECT. THERE ARE TWO SIGNIFICANT DEVIATIONS FROM THE OPERATION OF THE PROJECT AS ORIGINALLY CONTEMPLATED BY THE BUREAU OF RECLAMATION WHO ARE THE AUTHORS OF THE OPERATING PRINCIPLES. THESE ARE 1, THE FACT OF TRANSFERS OR ROLLING OF THE CONTENTS OF THE IRRIGATION POOL INTO THE JOINT-USE POOL AND THEREBY ALLOWING AT TIMES MORE THAN 20,000 ACRE FEET TO BE STORED IN TRINIDAD RESERVOIR UNDER THE TRANSFERRED MODEL RIGHT.

"2, NOT COUNTING FOR THE STORAGE OF WINTER FLOW AS A PART OF THE 20,000 ACRE FEET OF STORAGE ALLOWED BY THE TRANSFERRED MODEL RIGHT.

"IN ESSENCE, IN 1984, I CONCLUDED, BASED ON MY INDEPENDENT REVIEW, THAT THOSE TWO PRACTICES WERE NOT IN ACCORDANCE WITH THE OPERATING PRINCIPLES. FOUR YEARS LATER IN THE BUREAU REPORT, THE SAME CONCLUSIONS ARE SET FORTH ON PAGE 55, UNDER ITEMS A AND B ON PAGE 55."

SPECIAL MASTER: MR. SPRONK, IN THAT PARAGRAPH 4.1.5, YOU ARE SAYING THAT THERE ARE TWO SIGNIFICANT DEVIATIONS, AND THEN YOU GO ON TO EXPLAIN THE ROLLOVER PROCEDURE WITH STORAGE OF WINTER FLOWS.

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[Pages 16-17]

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THE WITNESS: THE ADJUSTMENT OR THIS ADJUSTMENT FOR CONSERVATION POOL STORAGE RESULTS IN THE AMOUNT OF WATER WHICH WAS DEPLETED FROM THE CONSERVATION POOL STORAGE, 40 PERCENT OF WHICH WOULD BE ASSOCIATED WITH KANSAS ENTITLEMENT — OR UP TO 40 PERCENT WOULD BE ASSOCIATED WITH KANSAS ENTITLEMENT OF WATER FROM THE CONSERVATION POOL STORAGE.

WHAT I HAVE DONE IN THIS ILLUSTRATION IS TO TAKE THE MONTHLY ANALYSIS THAT I PERFORMED, SUMMARIZE IT IN AN ANNUAL BASIS AS THE BUREAU DID IN THEIR TABLE 4 ON PAGE 16 OF JOINT EXHIBIT 23 SO THAT THESE NUMBERS FOR BOTH CASES 1 AND 2 UNDER THE COLUMNS DEPLETION THROUGH THE CONSERVATION POOL STORAGE DEPICT —

MR. DRAPER: IS THAT CASES 1 AND 2?

THE WITNESS: 1 AND 3. I'M SORRY.

— DEPICT THE QUANTITIES OF WATER DEPLETED FROM THE CONSERVATION POOL STORAGE — TO THE CONSERVATION POOL STORAGE AS A RESULT OF A DEPARTURE FROM THE OPERATING PRINCIPLES AT TRINIDAD RESERVOIR.

SPECIAL MASTER: BASED ON THE CONDITIONS THAT YOU HAVE JUST DESCRIBED?

THE WITNESS: THAT IS CORRECT.

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[Page 46]

THIRDLY, COLORADO HAS NOT EFFECTIVELY ADMINISTERED THE WATERS OF THE ARKANSAS RIVER TO PROTECT SURFACE WATER USERS, INCLUDING THE STATE OF KANSAS FROM THE USE OF GROUND WATER WITHIN THE ARKANSAS BASIN.

THE HISTORY OF WELL ADMINISTRATION OR LACK THEREOF IS BORNE OUT BY NO ATTEMPTS TO ADMINISTER GROUND WATER USAGE BEFORE 1965 AND AFTER THE 1965 GROUND WATER ACT, WHICH IS COLORADO EXHIBIT 378. THE ATTEMPT TO SHUT DOWN SOME WELLS RESULTED IN FAILURE BECAUSE THE ACTIONS WERE NOT PROPERLY UNDERTAKEN. I REFER THE COURT TO THE *FELLHAUER* CASE, WHICH IS COLORADO EXHIBIT 384.

THE CURRENT RULES AND REGULATIONS — IN OTHER WORDS, THE 1973 RULES AND REGULATIONS — THAT ARE IN EFFECT IN THE ARKANSAS BASIN ARE BASICALLY INEFFECTIVE IN CONTROLLING THE USE AND PUMPAGE BY EXISTING WELLS RESULTING IN NO REDUCTIONS IN PUMPING, AND THEY DO NOT PROVIDE AN ADEQUATE MEANS TO FULLY REPLACE THE STREAM DEPLETIONS CAUSED BY THESE WELLS, SPECIFICALLY THE WRITTEN PLANS THAT HAVE BEEN APPROVED AND USED BY EITHER THE — BY COLORADO OR THE LOWER ARKANSAS WATER MANAGEMENT ASSOCIATION AND THE COLORADO WATER PROTECTIVE AND DEVELOPMENT ASSOCIATION ARE INEFFECTIVE IN REPLACING ALL STREAM DEPLETIONS.

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Appendix Item 21

Excerpts from R. vol. 53

February 13, 1991

(Cross-examination of Timothy Durbin)

[Pages 143-146]

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Q. NOW, LOOKING AT THE MONTHS OF DECEMBER, 1950 THROUGH MARCH, 1951, THE HYDROLOGIC-INSTITUTIONAL MODEL CALCULATES NET DEPLETIONS OF STATE LINE FLOWS; IS THAT CORRECT?
A. WHICH PERIOD ARE WE LOOKING AT NOW?
Q. DECEMBER, 1950 THROUGH MARCH, 1951.
A. DECEMBER, 1950 —
Q. WHICH IS COMPACT YEAR 1951. SO IT IS DECEMBER — SO WE ARE TALKING ABOUT DECEMBER WHICH IS THE NEXT MONTH. IT IS UNDER COMPACT YEAR 1951, DECEMBER, '51, WHICH IS ACTUALLY DECEMBER, 1950.
A. OKAY.
Q. THROUGH MARCH OF 1951. THE HYDROLOGIC-INSTITUTIONAL MODEL IN EACH OF THOSE MONTHS, THE NEXT FOUR MONTHS, CALCULATES A NET DEPLETION OF STATE LINE FLOWS; IS THAT RIGHT?
A. THAT'S CORRECT.
Q. IN COMPARISON F.
THE MODEL ALSO CALCULATES DEPLETIONS OF USABLE STATE LINE FLOWS IN THOSE MONTHS AS WELL; IS THAT CORRECT?
A. YES.
Q. NOW LOOKING BACK AT TABLE 7A OF PLAINTIFF'S EXHIBIT 327, WHICH WAS THE SPRONK WATER ENGINEER'S MEMO, DOES IT MAKE SENSE TO YOU THAT WELL PUMPING IN COLORADO DEPLETED USABLE STATE LINE FLOW DURING THE PERIOD NOVEMBER, 1950 THROUGH MARCH, 1951, WHEN THE KANSAS DIVERSIONS DURING THAT PERIOD WERE ONLY 22 PERCENT OF THE STATE LINE

FLOWS AND THE UNUSED FLOW AT GARDEN CITY EXCEEDED THE FLOW AT THE STATE LINE?
A. YES, IT DOES.
Q. TO DETERMINE — WHY DOES THAT MAKE SENSE TO YOU?
SPECIAL MASTER: YOU ARE GOING TO ASK THAT DANGEROUS QUESTION?
MR. ROBBINS: YES, SIR.
THE WITNESS: IT MAKES SENSE TO ME, BECAUSE A CHANGE IN STATE LINE FLOWS RESULTS IN A CHANGE IN DIVERSIONS AND IT ALSO RESULTS IN A CHANGE IN GROUND WATER RECHARGE. AND THOSE TWO THINGS TOGETHER CONSTITUTE WHAT IS A CHANGE IN USABLE FLOW.
BY MR. ROBBINS:
Q. BUT LOOKING AT THE DIVERSIONS IN 1951 DURING THAT TIME, THEY ONLY DIVERTED 22 PERCENT OF THE WATER, DIDN'T THEY?
A. IF THE DATA IN 7A APPROPRIATELY REPRESENTS WHAT ACTUALLY OCCURRED.
Q. DO YOU HAVE ANY REASON TO DOUBT THAT THE DATA SHOWN IN 7A ARE ACCURATE?
A. NO.
Q. SO IN 1951, DURING THAT PERIOD THEY ONLY TOOK 22 PERCENT OF THE FLOW; RIGHT?
A. RIGHT. BUT IF THERE WAS MORE, THEY WOULD HAVE DIVERTED MORE. THAT IS THE UNDERLYING BASIS OF THE USABLE FLOW CALCULATIONS.
Q. WELL, NOW THERE WAS 52,000 ACRE FEET AT THE STATE LINE AND THE DIVERSIONS WERE 11,000, WHAT MAKES YOU SAY THAT IF THERE WAS MORE THEY WOULD HAVE TAKEN MORE? THERE WAS AT LEAST 40,000 MORE THERE AS IT WAS THAT THEY DIDN'T TAKE.
A. BECAUSE THEIR AVERAGE BEHAVIOR IS THAT REGARDLESS OF WHAT THEY'RE ACTUALLY DIVERT-

ING AND WHAT IS AVAILABLE THAT IF MORE FLOW IS AVAILABLE, THEY WILL TEND TO DIVERT MORE.

Q. SO —

SPECIAL MASTER: MR. DURBIN, LOOKING AT PLAINTIFF'S EXHIBIT 327, TABLE 7A, THIS IS A TABLE PREPARED FROM ACTUAL MEASUREMENTS, IT HAS NOTHING TO DO WITH THE MODEL?

THE WITNESS: IT HAS NOTHING TO DO WITH THE MODEL. THESE ARE ACTUAL DATA.

SPECIAL MASTER: SO YOU HAVE BEEN LOOKING AT THE YEAR 1950, '51. YOU CAN LOOK AT A NUMBER OF YEARS WHERE PERCENTAGE OF DIVERSION OF STATE LINE FLOWS IS FAIRLY LOW. WHY DOES THAT OCCUR? THEY WANT TO HAVE AS MUCH CANAL WATER OR RIVER WATER AS THEY CAN GET. WHY WOULD IT BE, PERCENTAGE FIGURES THAT ARE DOWN TO 18 PERCENT, 7 PERCENT, 17 PERCENT, 5 PERCENT AND SO ON?

THE WITNESS: BUT ON THE AVERAGE —

SPECIAL MASTER: I GUESS I'M LOOKING AT WINTER. I SHOULDN'T BE DOING THAT.

THE WITNESS: I THINK THAT'S WHAT MR. ROBBINS HAS US EXAMINING NOW IS THE WINTERTIME.

SPECIAL MASTER: OKAY. I UNDERSTAND IF IT IS WINTER, IT WOULD MAKE A DIFFERENCE. I WAS THINKING THAT WAS A YEARLY PERCENTAGE.

BY MR. ROBBINS:

Q. I'M STILL UNCLEAR. FOR EXAMPLE, IN A YEAR LIKE 1960, WHEN THERE IS APPROXIMATELY 60,000 ACRE FEET AT THE STATE LINE AND KANSAS ONLY TOOK 4,000 ACRE FEET, WHY IF THERE WERE MORE WATER KANSAS WOULD TAKE MORE. THEY PASSED, YOU KNOW, 55,000 ACRE FEET.

A. I THINK THAT IT'S EASIER TO SEE THIS IF WE EXAMINE, FIRST OF ALL, THE SUMMERTIME.

Q. WE CAN LOOK AT THE SUMMER IN TIME. BUT I WANT TO UNDERSTAND IN THE WINTER. YOU SAID THAT UNDER NO CIRCUMSTANCES WOULD A DEPLETION IN STATE LINE FLOWS NOT RESULT IN INJURY TO THE KANSAS WATER USERS, AND I'M INTERESTED, BECAUSE YOU SAY THAT IF THERE IS MORE WATER THEY DIVERT MORE.
A. THAT IS CORRECT.
Q. I'M CURIOUS WHY, FOR EXAMPLE, IN 1960, THERE IS 60,000 ROUND NUMBERS ACRE FEET AT THE STATE LINE, THEY TOOK JUST A LITTLE OVER 4,000, THERE IS 70,000 PASSING GARDEN CITY, AND YOU SAY THAT THERE IS NO WATER THAT COULD BE DEPLETED AT THE STATE LINE WITHOUT DEPRIVING KANSAS WATERS USERS OF USABLE FLOWS?

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[Pages 148-149]

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SPECIAL MASTER: MR. DURBIN, LET'S STEP AWAY FOR A MINUTE FROM THE REGRESSION TABLES AND SORT OF ADDRESS MR. ROBBINS'S POINT IN MORE GENERAL TERMS. HE'S SUGGESTING THAT ANY GIVEN YEAR — AND HE'S USING 1950, '51 AS AN EXAMPLE, BUT I THINK YOU COULD FIND SOME OTHER YEARS THAT WOULD BE SIMILAR — IN ANY GIVEN YEAR, KANSAS IS NOT — JUST STAY WITH THE WINTER FOR JUST A SECOND — KANSAS IN THE WINTERTIME IS NOT DIVERTING BUT SOME FRACTION OF WATER THAT IS AVAILABLE AT THE STATE LINE. AND ASSUMING THAT WE ARE NOT HITTING ONE OF THESE CAPS SO THAT IT BECOMES UNUSABLE, AND THESE CHARTS ALSO INDICATE THAT IN SOME OF THESE SAME YEARS THAT WE ARE LOOKING AT THERE IS ALSO WATER PASSING

GARDEN CITY, HE'S SAYING THAT AT LEAST IN THOSE WINTER MONTHS SHOULDN'T COLORADO PEOPLE BE ABLE TO TAKE MORE WATER — IT SAYS PUMPING, I PRESUME IT COULD BE TAKEN IT ANYWAY — WITHOUT INJURY, THE IDEA BEING THAT IF YOU REDUCE THE STATE LINE FLOWS, IT STILL ISN'T GOING TO MAKE ANY DIFFERENCE, BECAUSE KANSAS ISN'T TAKING ALL OF THE STATE LINE FLOWS THAT ARE THERE. NOW, I THINK IN GENERAL THAT IS THE POINT THAT HE'S TRYING TO MAKE.

*****

Appendix Item 22

Excerpt from R. vol. 54

February 14, 1991

(Direct Examination of Jeffrey Lefkoff)

[Pages 122-23]

*****

BY MR. DRAPER:

Q. ARE YOU ABLE TO CATCH — IN THE ADMINISTRATIVE MODULE DAILY TIME STEP, DOES THAT ALLOW YOU TO CAPTURE THE DAILY FLUCTUATIONS IN THE STREAMFLOW?

A. YES. THAT IS THE REASON FOR USING A DAILY TIME STEP IN THE ADMINISTRATIVE MODULE. THERE ARE SOMETIMES SIGNIFICANT DAY-TO-DAY FLUCTUATIONS IN STREAMFLOW. AND THAT OBVIOUSLY IS THE WAY THEY CALL AND SO BY BASING THE ADMINISTRATIVE MODULE ON A DAILY TIME STEP, THE MODEL IS ABLE TO CAPTURE THOSE INTRAMONTH FLUCTUATIONS, BOTH IN STREAMFLOW AND IN DIVERSIONS THAT WOULD OCCUR.

Q. AND DOES THAT ALSO APPLY TO RESERVOIR RELEASES?

A. YES.

Q. ARE THEY DONE ON A DAILY BASIS, ALSO?

A. YES, THAT IS RIGHT.

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[Page 125]

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A. . . . .

DAILY STREAMFLOW, WHICH I DISCUSSED A MOMENT AGO, IS ALSO READ IN. THAT IS DAILY STREAMFLOW AT — ON THE MAIN STEM OF THE ARKANSAS RIVER AT PUEBLO, AND ON THE PURGATOIRE AT LAS ANIMAS.

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Appendix Item 23

Excerpt from R. vol. 82

May 22, 1991

(Direct Examination of Duane Helton)

[Page 139]

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BY MR. ROBBINS:

Q. MR. HELTON, WHY IS THE PRE-COMPACT PUMPING FOR THE YEARS '40 TO '49 LESS IN SOME INSTANCES THAN THE PUMPING ATTRIBUTABLE TO THE PRE-COMPACT WELLS AFTER 1950?

A. BECAUSE OF THE SURFACE WATER SUPPLY THAT WAS AVAILABLE, YOUR HONOR.

*****

Appendix Item 24

Excerpt from R. vol. 89

February 25, 1992

(Direct Examination of Brent Spronk)

[Pages 40-50]

*****

BY MR. DRAPER:

Q. MR. SPRONK, WOULD YOU DESCRIBE THE CRITERIA WHICH YOU EMPLOYED IN DETERMINING USABLE STATE LINE FLOWS?

A. THE CONSIDERATIONS I GAVE WERE SEVERAL FOLD. ONE OF THE THINGS THAT I LOOKED AT IS WHETHER OR NOT THE — WHAT AMOUNTS WERE BEING REQUESTED FOR DELIVERY BY KANSAS OF STORED WATER IN JOHN MARTIN WAS MORE OR LESS THAN WHAT WAS ACTUALLY BEING DELIVERED TO THE STATE LINE.

ANOTHER THING THAT I LOOKED AT WAS WHETHER THE STREAMFLOWS BETWEEN THE STATE LINE AND GARDEN CITY WERE AFFECTED BY RAINFALL EVENTS, MAJOR RAINFALL EVENTS. AND THAT WAS INDICATED BY THE DAILY PRECIPITATION RECORDS THAT I UTILIZED—HAD AVAILABLE TO ME. I BASICALLY LOOKED AT JUST EVENTS THAT WERE IN TERMS OF THE AMOUNT OF WATER ON A DAILY BASIS OF RAINFALL, THAT IS ONE INCH PER DAY. I LOOKED AT THOSE LARGE RAINFALL EVENTS AND OBSERVED THE CHANGES IN FLOW AND WHAT CHANGES IN FLOW EXISTED AS A RESULT.

I ALSO CONSIDERED WHETHER OR NOT THE FRONTIER DITCH, WHICH IS THE UPPERMOST DITCH, MOST UPSTREAM DITCH OF THE KANSAS DITCHES, WHETHER IT DIVERTED ALL OR ESSENTIALLY ALL OF THE FLOW AVAILABLE AT THE STATE LINE. AND THERE ARE A FEW OCCASIONS IN THE DRY YEARS WHERE ESSENTIALLY ALL OF THE FLOWS WERE BEING DIVERTED BY THE

FRONTIER DITCH. THAT, FOR INSTANCE, WOULD INDICATE THAT OBVIOUSLY MORE WATER COULD BE USED BY THE OTHER DITCHES.

THE OTHER CONSIDERATIONS WERE WHETHER THE — WHAT I HAVE REFERRED TO AS THE UPPER GARDEN CITY DITCHES, WHETHER THEIR DIVERSIONS ARE MADE UP OR ESSENTIALLY TOOK ALL OF THE RIVER FLOW AS WAS RECORDED AT SYRACUSE. THE UPPER DITCHES, AS THE WAY I HAVE COMBINED THEM, CONSIST OF THE AMAZON DITCH, THE GREAT EASTERN DITCH, AND THE SOUTHSIDE DITCH. AS YOU CAN SEE FROM KANSAS EXHIBIT 20, THOSE ARE THE LOWER THREE—EXCUSE—THOSE ARE THE MIDDLE THREE DITCHES. THERE IS STILL ONE DITCH BELOW THAT, ONE HEAD GATE BELOW THAT, FARMERS DITCH AND GARDEN CITY DITCH. THEY ACTUALLY NOW DIVERT AT A COMMON HEAD GATE. THE UPPER GARDEN CITY DITCHES, THE WAY I DEFINED THEM ARE THE AMAZON DITCH AND THE GREAT EASTERN DITCH, AND THE SOUTHSIDE DITCH.

AND I TOTALLED THOSE DAILY DIVERSIONS AGAIN ON A DAILY BASIS AND COMPARED THOSE WITH THE FLOWS AVAILABLE AT SYRACUSE. AND IF THE ACCUMULATED DIVERSIONS WERE SIGNIFICANTLY GREATER THAN THE FLOW AT SYRACUSE, THEN I CONSIDERED THAT WAS PROBABLY A DAY THEY WERE USING ALL OF THE WATER THAT WAS AVAILABLE TO THEM.

FINALLY—EXCUSE ME, THERE ARE TWO MORE CRITERIA.

YOU WILL RECALL THAT THERE WERE—THAT I MENTIONED EARLIER THERE WERE STREAMFLOW RECORDS ON A DAILY BASIS FOR SOME OF THE INTERVENING DITCHES BETWEEN THE STATE LINE AND GARDEN CITY. THE SYRACUSE GAUGE, FOR IN-

STANCE, THERE WAS A CONTINUOUS RECORD OVER THE WHOLE PERIOD. AT THE OTHER DITCHES, THERE ARE VARYING RECORDS. MOST OF THEM HAVE RECORDS DURING THE LATE '70'S AND EARLY '80'S. THE DAILY AMOUNTS OF FLOW RECORDED AT THOSE GAUGES WERE ALSO UTILIZED FOR THEIR PERIOD OF RECORD. THOSE GAUGES INDICATE THAT THE FLOWS AT TIMES ESSENTIALLY WERE ZERO THERE, ALSO, WERE VERY LOW AT POINTS. AND WHEN THE RIVER DRIED UP AT ONE OF THESE POINTS, IT WAS AN INDICATOR TO ME THAT THEN ALL OF THE WATER THAT WAS THEN AVAILABLE AT THE STATE LINE WAS BEING UTILIZED.

THE CRITERIA THAT I ACTUALLY APPLIED WASN'T A ZERO FLOW, IT WAS 5 CFS AT THOSE GAUGES. SO IF THE FLOW AT THE GAUGES WERE 5 CFS OR LESS, IN MY OPINION, ESSENTIALLY THE RIVER WAS BEING FULLY UTILIZED. THE 5 CFS, I MIGHT ADD, WOULD ACCOUNT FOR RETURN FLOWS OR TRIBUTARY INFLOWS BETWEEN THE GAUGE AND PROBABLY THE POINT OF DIVERSION UPSTREAM. AND I MIGHT ALSO REFLECT THE FACT THAT NOT ALL OF THE FLOWS, 100 PERCENT OF THE FLOWS CAN BE EFFECTIVELY DIVERTED BY THE RIVER HEAD GATE. AT TIMES YOU CAN HAVE LEAKAGE AND UNDER FLOW AROUND THE GAUGE AND THERE WILL BE SOME SMALL AMOUNTS, PARTICULARLY WHEN YOU ARE DEALING WITH A WIDE RIVER CHANNEL.

FINALLY, THE LAST CRITERIA THAT I UTILIZED IN THE DAILY FLOW ANALYSIS WAS WHETHER THE FLOW AT THE GARDEN CITY GAUGE WAS LESS THAN A SPECIFIED AMOUNT. AGAIN, THE GARDEN CITY GAUGE REPRESENTS SORT OF THE BOTTOM END OF THE SYSTEM THAT I LOOKED AT. IT IS LO-

CATED ON KANSAS EXHIBIT 20, AND IS ABOUT 13 MILES BELOW THE LAST DITCH DIVERSION, THAT BEING THE FARMERS DITCH AND GARDEN CITY DITCH DIVERSION DAM.

THE FLOW RATES WHICH I UTILIZED FOR THE GARDEN CITY GAUGE ACTUALLY VARIED OVER TIME. THEY WERE ON THE AMOUNT OF 20 CFS FOR THE TIME PERIOD OF 1950 THROUGH '72, AND 5 CFS STARTING IN U.S.G.S. WATER YEAR 1973.

THE REASON FOR THE DECREASE IN THE MIDDLE OF MY STUDY WAS TO ACCOUNT FOR SOME OF THE DISCHARGES THAT OCCURRED THROUGH THE GARDEN CITY POWER PLANT AND BEET PLANT, THAT I BELIEVE THERE HAS BEEN SOME TESTIMONY ABOUT PREVIOUSLY IN THIS CASE. THE 15 CFS CHANGE MORE OR LESS REPRESENTS AN AMOUNT TO ACCOUNT FOR THAT DISCHARGE.

THE DISCHARGE CEASED IN AND AROUND THE EARLY '70'S. I THINK ACTUALLY IN '75 OR '76, THEREABOUTS. BUT IT DECLINED SLOWLY IN THE EARLY '70'S. THAT IS WHY I CUT IT OFF A COUPLE OF YEARS EARLIER.

SPECIAL MASTER: YOU USED 5 CFS BEGINNING IN 1973 AND UNTIL WHAT YEAR?

THE WITNESS: THAT WAS UTILIZED UNTIL THE END OF THE STUDY PERIOD, UNTIL 1985. PRIOR TO THAT, 20 CFS WAS EMPLOYED.

WHENEVER THE FLOW THAT WAS RECORDED BY THE U.S.G.S. SURVEY, OR BASED ON THE ESTIMATE THAT I OBTAINED FROM THE DIVISION OF WATER RESOURCES FROM 1970 THROUGH '85, WAS BELOW THESE AMOUNTS, THEN I CONSIDERED ALL OF THE FLOW THEN OCCURRING AT THE STATE LINE TO BE USABLE.

SPECIAL MASTER: AND IF THE FLOWS WERE ABOVE THOSE AMOUNTS, YOU CONSIDERED THEM NOT TO BE USABLE?

THE WITNESS: YES. I CONSIDERED ANY ADDITIONAL FLOWS THAT WOULD OCCUR AT THE STATE LINE WOULD NOT BE USABLE.

I THINK THAT SUMMARIZES THE GENERAL CRITERIA THAT I APPLIED.

AND THE MANNER IN WHICH I APPLIED THIS CRITERIA WAS TO LOOK AT EVERY DAY IN THE STUDY PERIOD, 1950 THROUGH '85, TO MAKE A DECISION, USING THE DATA THAT WAS AVAILABLE THAT I DESCRIBED AND THESE GENERAL CRITERIA TO JUDGE WHETHER IN MY OPINION ON THAT DAY MORE WATER COULD HAVE BEEN USED OR NOT. IN LOOKING AT, OBVIOUSLY MANY DAYS, AND I DON'T HAVE THE NUMBER IN FRONT OF ME, BUT EACH DAY FROM 1950 THROUGH 1985.

BY MR. DRAPER:

Q. SO HOW DID YOU ACTUALLY GO ABOUT APPLYING THE CRITERIA? DID YOU HAVE A SPREAD SHEET THAT CONTAINED ALL OF THIS INFORMATION?

A. IN ORDER TO LOOK AT THE DATA ON A DAY-BY-DAY BASIS, I DID PUT IT INTO A SPREAD SHEET WHICH WOULD ILLUSTRATE THE DATA AND SOME VARIOUS CALCULATIONS, UTILIZING THE DATA TO HELP INDICATE WHETHER NOT ON A GIVEN DAY WHETHER ALL OF THE FLOW WAS BEING USED. AND AN EXAMPLE OF THAT KIND OF SPREAD SHEET IS EXHIBIT 645.

Q. ALL RIGHT. LET'S TAKE A LOOK AT THAT EXHIBIT, IF YOU WOULD, PLEASE.

A. EXHIBIT 645 IS A SERIES OF 12 TABLES. ONE TABLE—OR ONE PAGE, THAT IS—FOR EACH MONTH DURING THE YEAR 1955. THIS IS A SAMPLE YEAR. THERE ARE ACTUALLY A SIMILAR SET OF PAGES OR

TABLES FOR EVERY OTHER MONTH IN THE STUDY PERIOD 1950 THROUGH 1985. EACH PAGE REPRESENTS ONE MONTH AND HAS THE DAILY VALUES OF THE DATA THAT I DESCRIBED DEPICTED ON IT. THE COLUMNS INDICATE, FOR INSTANCE, THE STATE LINE FLOW. IT ALSO INDICATES WHEN KANSAS IS CALLING FOR WATER, AND WHEN IT IS CALLING, THAT WOULD BE THE FOURTH COLUMN OVER LABELED "KANSAS CALL W/3 DAY LAG." I INCORPORATED A THREE-DAY LAG FOR—TO ADD ONTO THE CALLS TO TAKE INTO ACCOUNT THE TRANSIT TIME BETWEEN JOHN MARTIN AND THE STATE LINE.

THE SECOND COLUMN INDICATES WHETHER THE STATE LINE FLOW WAS IN EXCESS OR SHORTAGE OF THE—LET ME BACK UP. THE SECOND COLUMN OF NUMBERS OTHER THAN THE DAYS IS ENTITLED "EXCESS/SHORTAGE STATELINE FLOW." THAT REPRESENTS THE EXCESS OF SHORTAGE OF THE STATE LINE FLOW AS COMPARED TO THE KANSAS CALL.

NOW, THIS FIRST SHEET, OBVIOUSLY, IS IN OCTOBER AND THE ASTERISKS IN THE THIRD COLUMN WHERE THE COLUMN LABELED "KANSAS CALL W/3 DAY LAG" INDICATE THAT THE RESERVOIR WAS EMPTY ON THOSE DAYS. IF THERE IS AN "N/A" INSIDE OF THAT COLUMN, IT WOULD INDICATE THERE WAS WATER IN THE RESERVOIR, BUT IT WASN'T BEING CALLED THAT DAY.

Q. YOU ARE REFERRING TO THE FIRST PAGE OF EXHIBIT 645?

A. YES, THANK YOU.

MOVING FURTHER OVER IN THE SPREAD SHEET, YOU WILL SEE THAT THERE ARE DAILY VALUES REPORTED FOR SYRACUSE FOR THE GARDEN CITY GAUGE. I ALSO HAVE A COLUMN THERE, WHAT IS

THE FLOW AT GARDEN CITY WHEN KANSAS IS DEMANDING WATER FROM JOHN MARTIN. AND IT WOULD INDICATE A VALUE IN THAT COLUMN, A NUMERICAL VALUE IF THERE WAS A CALL ON ANY GIVEN DAY.

Q. THE COLUMN ENTITLED "FLOW AT GARDEN CITY," IS THAT THE INFORMATION FROM KANSAS EXHIBIT 644?

A. YES, THANK YOU. IF YOU COMPARE 644 FOR THE YEAR 1955, WATER YEAR 1955, THE NUMBERS IN THAT COLUMN WILL BE IDENTICAL TO THE ONES IN 644. 644 WAS THE COMPILATION OF DAILY FLOWS JUST AT GARDEN CITY.

SPECIAL MASTER: LET'S JUST TAKE A LOOK AT THAT COLUMN FOR A SECOND.

THE WITNESS: SURE.

SPECIAL MASTER: USING YOUR 20 CFS CRITERIA, THIS WOULD INDICATE THAT THE ONLY TIME THAT WAS EXCEEDED WAS ON THE 28TH AND 29TH OF THE MONTH WHERE IT WAS 22 CFS. IF YOU GO BACK TO THE STATE LINE FLOWS, THEY ARE 42 AND 41 ON THOSE TWO DAYS. THIS IS MAYBE TOO SMALL A CHANGE TO BE USING AS AN EXAMPLE, BUT I GUESS I DON'T QUITE UNDERSTAND THEN WHAT THE RELATIONSHIP WOULD BE. YOU INDICATED THAT IF MORE THAN 20 CFS DURING THIS PERIOD OF TIME WAS PASSING GARDEN CITY THAT YOU WOULD NOT CALL FOR ADDITIONAL FLOWS. SO DO YOU THEN CONSIDER THAT PART OF THE 42 AND 41 IS NOT USABLE?

THE WITNESS: YOUR HONOR, IF YOU LOOK OVER FURTHER TO THE RIGHT-HAND SIDE OF THE SPREAD SHEET, THERE IS A COLUMN LABELED "SWE USABLE FLOW?"

SPECIAL MASTER: YES.

THE WITNESS: WITH A ZERO EQUALLING "NO" AND A 1 EQUALING "YES." YOU WILL SEE THAT FOR THIS PARTICULAR MONTH, THE FIRST MONTH DEPICTED IN EXHIBIT 645, OCTOBER 1955, THAT ALL OF THE DAYS WERE IDENTIFIED AND DETERMINED TO BE DAYS WHEN ALL OF THE FLOW WAS USED WITH THE EXCEPTION OF THE DAYS FOLLOWING THE 25TH OF OCTOBER AND ON. ALL OF THOSE DAYS WERE NOT DAYS WHEN IN MY JUDGMENT THE FLOW WAS ALL USED. BUT FOR THE FIRST 24 DAYS OF THE MONTH. I DID CONSIDER THAT ALL OF THE FLOW WAS BEING USED.

I HAVE ANOTHER EXAMPLE WE WILL WORK THROUGH THAT MIGHT ANSWER SOME MORE OF YOUR QUESTIONS—

SPECIAL MASTER: ALL RIGHT.

THE WITNESS: —ABOUT HOW THE CRITERIA APPLY.

SPECIAL MASTER: ALL RIGHT.

THE WITNESS: BUT I DON'T KNOW IF YOU WOULD LIKE ME TO DO THAT FIRST OR FINISH THE DESCRIPTION OF THIS TABLE.

SPECIAL MASTER: WHY DON'T YOU FINISH THE DESCRIPTION FIRST?

THE WITNESS: OKAY.

SPECIAL MASTER: THEN LET'S COME BACK TO THIS.

THE WITNESS: THERE ARE COLUMNS FOR EACH OF PRECIPITATION GAUGES AND THEY INDICATE THE—THE VALUES INDICATE WHEN PRECIPITATION OCCURRED AND THE AMOUNT IN EXCESS OF ONE INCH PER DAY. SYR WOULD BE AN ABBREVIATION FOR SYRACUSE, G.C. WOULD BE AN ABBREVIATION FOR GARDEN CITY, AND LAK IS AN ABBREVIATION FOR THE LAKIN PRECIPITATION GAUGE.

BY MR. DRAPER:

Q. DOES THE .1 THAT APPEARS FOR THE 7TH OF THE MONTH INDICATE .1 INCH RAIN OR 1.1?

A. 1.1.

Q. SO THAT IS THE NET—

A. CORRECT.

THE NEXT SET OF COLUMNS WOULD BE ASSOCIATED WITH KANSAS—DAILY KANSAS DITCH DIVERSIONS. THEY ARE LUMPED INTO FOUR DIFFERENT CATEGORIES, THE FIRST CATEGORY BEING THE STATE LINE TO SYRACUSE DIVERSIONS. AND THEY WOULD INCLUDE THE FRONTIER, HOWITT, AND FORT AUBREY DITCH DIVERSIONS.

THE NEXT COLUMN, SYRACUSE TO SOUTH SIDE, WOULD BE THAT REACH OF STREAM THAT INCLUDES THE AMAZON, GREAT EASTERN AND SOUTH SIDE DITCH DIVERSIONS, IN OTHER WORDS, THE UPPER GARDEN CITY DIVERSIONS AS I HAVE DEFINED THEM EARLIER.

FINALLY, THE LAST COLUMN LABELED "BELOW SOUTH SIDE TO GAR. CITY" WOULD INCLUDE THE FARMERS AND GARDEN CITY DITCHES AND THEIR DIVERSIONS.

THE THREE DIFFERENT CATEGORIES ARE THEN ADDED UP IN THE TOTAL—DAILY KANSAS DITCH DIVERSIONS ARE ILLUSTRATED IN THE TOTAL COLUMN UNDER THE "KANSAS DITCH DIVERSION" HEADING.

FINALLY, THERE ARE SOME NET GAIN AND LOSS COLUMNS, WHICH TAKE INTO ACCOUNT THE GAUGE FLOWS AND THE DIVERSIONS IN BETWEEN THOSE GAUGES TO DETERMINE IS THERE A LOSS OR A GAIN IN THAT REACH DURING THAT PARTICULAR DAY.

THE NEXT COLUMN IS THE SYRACUSE LESS UPPER GARDEN CITY DITCH DIVERSIONS AS A INDI-

CATOR OF WHAT WAS GOING ON THAT DAY IN RELATION TO THE ACCUMULATED DIVERSIONS FOR THE UPPER GARDEN CITY DITCHES AS OPPOSED TO THE SYRACUSE. IT WOULD REPRESENT, FOR INSTANCE, ON THE FIRST DAY—OR ON ALL OF THE DAYS IT WOULD BE THE SYRACUSE FLOW LESS THE COLUMN LABELED "SYRACUSE MINUS SOUTHSIDE KANSAS DITCH DIVERSIONS."

THE NEXT TWO COLUMNS INDICATE THE AMOUNT—OR SW USABLE FLOW QUESTION MARK INDICATES WHETHER IN FACT THAT DAY IN MY JUDGMENT WAS A DAY WHEN ALL OF THE FLOW WAS USED OR NOT. AND THE USABLE STATE LINE FLOW AMOUNT JUST CARRIES OVER THE FULL AMOUNT OF THE STATE LINE FLOW WHENEVER A 1 APPEARS IN THE PRIOR COLUMN. AND A ZERO, OF COURSE, WAS FOR THOSE DAYS WHEN A ZERO WAS RECORDED AT THE PRIOR COLUMN. AS AN EXAMPLE, THE FIRST DAY A 1 APPEARS SO THERE IS 27 CFS. IF YOU LOOK OVER TO THE STATE LINE FLOW COLUMN ON THE LEFT-HAND SIDE OF THE PAPER, THERE WAS 27 CFS AT THE STATE LINE.

LIKEWISE, LET'S LOOK AT THE 31ST DAY OF THE MONTH, AND YOU WILL SEE THAT THERE WAS—THERE WAS NO—THERE WAS SOME FLOW THAT WASN'T USABLE, I GUESS IS THE BEST WAY TO PUT IT ON THAT DAY, IN MY JUDGMENT. THEREFORE, THE USABLE STATE LINE AMOUNT, I JUST PUT ZERO IN THERE. SO IT WAS PLUS OR MINUS—I MEAN THE FULL THING OR NOT, THE FULL AMOUNT AT THE STATE LINE, DEPENDING ON THE DECISION AND THE AMOUNT SHOWN IN ANSWERING THE QUESTION WHETHER THERE WAS USABLE FLOW OR NOT THAT DAY.

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Appendix Item 25

Excerpt from R. vol. 109

May 14, 1992

(Cross-examination of Steve Vandiver)

[Pages 68-69]

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Q. LET'S TURN TO 1976, WHICH WOULD BE THE YEAR THAT INCLUDES THE BEGINNING PERIOD FOR THIS CURVE NUMBER 30. IF WE LOOK AT THE PAGE STARTING WITH 1976 AND CONTINUING BACK FOR THE SIX YEARS UNTIL 1982, IS THERE ANYTHING SIGNIFICANT ABOUT THE VALUES HERE THAT WOULD INDICATE TO YOU WHY THERE WASN'T A CHANGE IN THE RATING CURVE?

A. I THINK I HAVE TESTIFIED TO THAT. THERE WASN'T ANY MEASUREMENTS OR THERE WASN'T ANY FLOW ENOUGH TO MEASURE THAT WAS HIGH ENOUGH TO CHANGE THE END OF THE CURVE.

Q. OR ANY SECTION OF THE CURVE; IS THAT RIGHT? IT IS ESSENTIALLY ZERO ALL OF THE TIME?

A. THERE WAS A COUPLE OF LOW FLOW MEASUREMENTS, VERY LOW FLOW MEASUREMENTS, I THINK TWICE DURING THE YEAR, ONE IN MAY AND ONE IN SEPTEMBER, THAT WERE LESS THAN TWO-TENTHS OF A CFS.

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Appendix Item 26

Excerpt from R. vol. 115

May 22, 1992

(Direct Examination of Duane Helton)

[Page 33]

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SPECIAL MASTER: WELL, BEFORE THE 1970'S, YOU JUST HAVE SAID THERE WAS REALLY NOT ANY LARGE IMPACT FROM WELLS IN KANSAS.

THE WITNESS: THAT IS CORRECT.

SPECIAL MASTER: SO DURING THE '70'S, WHERE YOU ARE CONCERNED, WE HAD THE SITUATION WHERE BOTH SIDES TENDED TO TAKE WHAT THEY COULD, AND ON A PROPORTIONAL BASIS, ACCORDING TO THEIR RIGHTS. BUT YOU ARE SAYING THAT DURING THAT PERIOD THAT THE WATER THAT KANSAS TOOK IMPACTED COLORADO IN AN ADVERSE WAY?

THE WITNESS: NO, SIR. I WILL NOT SAY THAT THE INCREASED THIRST IN KANSAS CAUSED INCREASED DEMANDS AGAINST CONSERVATION STORAGE DURING THE 1970'S. THE REASON I WON'T SAY THAT IS BECAUSE THE INFLOW INTO THE CONSERVATION STORAGE DURING MOST OF THOSE YEARS AND CERTAINLY DURING THE LATER YEARS WAS RELATIVELY SMALL. AND I BELIEVE THAT KANSAS WOULD HAVE CALLED FOR THE RELEASE OF ALL OF THAT WATER EVEN WITHOUT THE INCREASED THIRST.

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Appendix Item 27

Excerpt from R. vol. 116

May 26, 1992

(Cross-examination of Duane Helton)

[Page 69]

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SPECIAL MASTER: I UNDERSTAND THAT. YOU KNOW, WE HAVE GOT A LOT OF EVIDENCE AND A LOT OF DOCUMENTARY EVIDENCE ON THE MANAGEMENT OF THE PROGRAM THAT COLORADO UNDERTOOK WITH RESPECT TO WELLS. BUT I THINK THE QUESTION WAS, IF YOU TRIED TO OPERATE THE WELLS STRICTLY IN ACCORDANCE WITH THE PRIORITY SYSTEM, THEY WOULDN'T OPERATE VERY OFTEN, WOULD THEY?

THE WITNESS: THAT IS CORRECT.

BY MR. DRAPER:

Q. ISN'T THAT TRUE ALSO OF PRE-COMPACT WELLS?

A. I THINK THAT IS TRUE ALSO.

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Appendix Item 28

Excerpts from R. vol. 127

September 23, 1992

(Direct Examination of Steve Larson)

[Pages 117-121]

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THE OTHER THING — AGAIN, WE ARE TRACKING TWO RUNS OF THE MODEL. WE ARE NOT GOING TO BE TAKING THE ACTUAL HISTORICAL STREAMFLOWS AT THE BASE LINE AND RUNNING A MODEL WITH AN INSTITUTIONAL CONDITION AND COMPARING THE HISTORICAL FLOWS TO THE CALCULATED FLOWS OF THE CONDITION. WE ARE NOT GOING TO BE DOING THAT. WE DON'T DO THAT. WE COMPARE TWO RUNS OF THE MODEL SO THAT WE TRY TO TAKE ADVANTAGE OF THE POTENTIAL FOR ERRORS TO IMPROVE OUR RESULT. AND I THINK WE HAVE SEEN AGAIN THROUGH THE SENSITIVITY STUDIES PROVIDED BY THE U.S. THERE IS — THAT FACT CAN BE SEEN.

SPECIAL MASTER: TELL ME A LITTLE BIT MORE OF YOUR VIEW OF THAT. THAT IS ANOTHER CRITICISM THAT IN FACT THOSE DON'T ALWAYS CANCEL THEMSELVES OUT.

THE WITNESS: ABSOLUTELY, THEY DON'T ALWAYS CANCEL OUT. ALL WE CAN SEE IS THAT THERE IS A LESS SENSITIVITY OF THE DEPLETIONS THAN THERE IS TO THE ACTUAL CALCULATIONS OF STATE LINE FLOWS. AND I THINK, AS I SAID EARLIER, THAT IS A VERY FAVORABLE CONDITION, BECAUSE THE POTENTIAL ERRORS IN THE PARAMETER WILL NOT AFFECT THE DEPLETIONS CALCULATION AS MUCH AS THEY WILL AFFECT STATE LINE FLOW CALCULATIONS.

I DON'T THINK IT IS REALLY POSSIBLE TO LOOK AT THE UNCERTAINTY IN THE ESTIMATES OF DEPLETIONS, WHICH IS REALLY WHAT WE ARE LOOKING AT ANYWAY. I THINK WE ARE GETTING A LITTLE AHEAD OF OUR PRESENTATION HERE. BUT I THINK I TALKED ABOUT THIS EARLIER, YOU CAN USE MONTE CARLO

ANALYSIS TO TRY TO DO THIS. THAT'S BY TRYING — BY LOOKING AT THE UNCERTAINTY IN INDIVIDUAL PARAMETERS, YOU CAN CALCULATE THE UNCERTAINTY IN THE OUTCOME OVER SOME RANGE. BUT AS I SAID EARLIER, I AM NOT SURE THAT REALLY HELPS YOU TOO MUCH FROM A STANDPOINT OF, WELL, IF WE HAD THAT UNCERTAINTY CALCULATED FOR THE COLORADO ANALYSIS AND FOR THE KANSAS ANALYSIS, THEN WE COULD KIND OF COMPARE THE TWO AND SEE WHAT THE RELATIVE AMOUNTS OF UNCERTAINTY WERE IN THE TWO ANALYSES.

I DON'T THINK THAT CAN BE DONE WITH THE COLORADO ANALYSIS JUST BECAUSE OF LOGISTICS. I DON'T THINK IT IS FEASIBLE TO DO IT. WE MIGHT BE ABLE TO DO IT WITH THE H-I-M BY DOING THOUSANDS AND THOUSANDS OF RUNS. I THINK THERE ARE A LOT OF ASSUMPTIONS YOU WOULD HAVE TO MAKE. YOU WOULD HAVE ESTIMATES ON TOP OF ESTIMATES.

HOWEVER, I DON'T THINK THAT CHANGES THE CONCLUSIONS THAT YOU REACH. THAT IS, LIKE, FOR EXAMPLE, SUPPOSE THAT WE ESTIMATED DEPLETIONS OF 50,000 ACRE FEET AND THE MARGIN OF THE UNCERTAINTY IS — LET'S SAY, THE STANDARD DEVIATION OF THE ESTIMATE IS PLUS OR MINUS 30,000, WELL, THAT DOESN'T CHANGE THE FACT THAT WAS THE BEST ESTIMATE THAT YOU CAN PROVIDE. ALL IT TELLS YOU IS THERE IS SOME PROBABILITY THAT THE TRUE VALUE, WHICH WE DON'T KNOW, COULD BE LOWER OR COULD BE HIGHER. AND THE NARROWER WE GET THAT UNCERTAINTY, THE LESS PROBABILITY THAT THE TRUE VALUE LIES FURTHER AWAY FROM THE ESTIMATE THAT WE HAVE. IT DOESN'T CHANGE THE ESTIMATE. THE ONLY WAY THAT I CAN SEE TO REDUCE THAT UNCERTAINTY IS YOU HAVE TO HAVE

MORE DATA, MORE DETAILED DATA, AND WE DON'T HAVE THAT.

SPECIAL MASTER: DO ENGINEERS HAVE BASIC JUDGMENTS ABOUT SOME OF THESE THINGS — APART FROM THE MONTE CARLO ANALYSIS — WHERE YOU LOOK AT THIS, AND YOU SAY MY NUMBER IS A HUNCH, THAT IS THE BEST ESTIMATE, THAT IS WHAT EVERYTHING SHOWS, BUT I COULD BE PRETTY SURE THAT IT IS BETWEEN 90 AND 100, SOMETHING LIKE THAT, THE REAL FACTS ARE SOMEWHERE IN THAT NEIGHBORHOOD?

THE WITNESS: I THINK WE CAN DO THAT FOR THE PREDICTION OF THE STREAMFLOWS. THE PROBLEM IS TRYING TO DO IT FOR THE PREDICTION OF DEPLETIONS, WHICH ARE REALLY THE ESSENCE OF THE ANALYSIS. AND THERE YOU DO HAVE THE CORRELATED ERROR PROBLEM YOU HAVE TO DEAL WITH. AND THE ONLY WAY THAT I KNOW OF GETTING AROUND THAT IS TO DO THE MONTE CARLO ANALYSIS. AND I DON'T KNOW THAT IT IS REALLY FEASIBLE. AND AGAIN, I AM NOT SURE THAT IT HELPS TO MAKE THE DECISION, BECAUSE THE ESTIMATED VALUE STILL IS YOUR BEST ESTIMATE. IT IS JUST MAYBE A HIGHER OR LOWER PROBABILITY THAT THE TRUE VALUE COULD BE DIFFERENT BY SOME AMOUNT OR ANOTHER.

SPECIAL MASTER: ALL RIGHT.

BY MR. DRAPER:

Q. NOW, WE HAVE TALKED ABOUT DIFFERENCES BETWEEN THE TWO MODELS. ARE THERE AREAS IN WHICH THE RESULTS OF THE KANSAS AND COLORADO ANALYSES AGREE?

A. WELL, I THINK IT IS CLEAR FROM BOTH OF THE ANALYSES THAT THERE ARE TRENDS IN STREAMFLOW DEPLETIONS AS A RESULT OF THE INCREASED PUMPING IN COLORADO. I THINK THAT

IS PRETTY UNAMBIGUOUS FROM BOTH OF THE ANALYSES.

SPECIAL MASTER: SAY THAT IN A LITTLE MORE DETAIL.

THE WITNESS: WELL, WE'LL GET TO AN EXHIBIT IN A MOMENT HERE.

SPECIAL MASTER: ALL RIGHT.

BY MR. DRAPER:

Q. I BELIEVE THAT EXHIBIT IS PLAINTIFF'S 695.
IS PLAINTIFF'S EXHIBIT 695 AN EXHIBIT YOU PREPARED?

A. YES, IT IS.

Q. WHAT DOES IT SHOW?

A. THIS SHOWS THE TOTAL ANNUAL DEPLETIONS — AND THIS WOULD BE DEPLETIONS AND ACCRETIONS — FOR THE TWO DIFFERENT ANALYSES. ONE IS THE COLORADO WATER BUDGET ANALYSIS AND THE OTHER IS THE ANALYSIS USING THE H-I-M BUT WITH THE COLORADO PUMPING ESTIMATES. AND THAT IS IN BLUE. THAT IS THE SAME SCENARIO 2 ON EXHIBIT 642.

SPECIAL MASTER: THE BLUE BARS INCLUDE THE COLORADO PUMPING ESTIMATES?

THE WITNESS: THE COLORADO PUMPING ESTIMATES USED IN THE H-I MODEL. NOW, REMEMBER, IT IS NOT —

SPECIAL MASTER: I UNDERSTAND THE DISTRIBUTION MAY NOT BE QUITE THE SAME.

THE WITNESS: EXACTLY. BUT AGAIN, IT IS AN ATTEMPT TO TRY TO PUT THINGS ON A MORE EVEN SCALE FOR COMPARISON PURPOSES.

AND THIS SHOWS THE ANNUAL VALUES FOR EACH YEAR FOR THE TWO ANALYSES, THE COLORADO WATER BUDGET ANALYSIS AND THE HYDROLOGIC-INSTITUTIONAL MODEL.

BY MR. DRAPER:

Q. IS IT POSSIBLE TO DRAW ANY CONCLUSIONS FROM THIS COMPARISON?

A. YES, I BELIEVE IT IS. I THINK YOU CAN LOOK AT THIS EXHIBIT AND SEE THE TREND OF INCREASE IN BOTH OF THE ANALYSES AS A RESULT OF HIGHER LEVELS OF PUMPING. AND IN PARTICULAR, YOU CAN SEE THAT IN THE PERIOD FROM THE MID TO LATE 1970'S THAT BOTH ANALYSES SHOW THAT TO BE THE PERIOD OF HIGHEST DEPLETIONS IN TERMS OF AT LEAST SUSTAINED LEVELS OF THE DEPLETIONS FOR A LONGER PERIOD OF TIME. I THINK IT IS UNAMBIGUOUS TO ME THAT THERE ARE THESE TRENDS IN THE '70'S — THE LATE '70'S, THE PERIOD OF HIGHEST DEPLETIONS. I THINK IT IS CLEAR FROM BOTH ANALYSES THAT THAT'S THE CONCLUSION THAT YOU WOULD DRAW.

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[Pages 123-24]

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Q. I'M NOW READY TO TURN TO ANOTHER SUBJECT, NAMELY, USABLE FLOW.

MR. HELTON HAS SUGGESTED THAT THE H.C.I. ANALYSIS IS PREFERABLE TO THE SPRONK ANALYSIS WITH RESPECT TO USABLE FLOWS.

DO YOU AGREE WITH THAT, MR. LARSON?

A. NO, I DO NOT.

Q. WHY NOT?

A. WELL, THERE ARE A COUPLE OF REASONS. FIRST OF ALL, THE STREAMFLOWS DURING THE LATE 1970'S AT THE STATE LINE WERE VERY LOW. AND THUS, I THINK DURING THIS PERIOD, IT IS CLEAR

THAT THE USABILITY OF STREAMFLOW IN KANSAS WOULD BE VERY HIGH DURING THAT PERIOD. THIS PERIOD OF HIGH USABILITY IS COINCIDENT WITH THE PERIOD OF HIGH DEPLETIONS THAT WE HAVE SEEN AS CALCULATED BY BOTH OF THE ANALYSES — THAT IS, BOTH THE COLORADO ANALYSIS AND OUR ANALYSIS USING THE HYDROLOGIC-INSTITUTIONAL MODEL — CLEARLY SHOW THE HIGHER DEPLETIONS ARE DURING THIS PERIOD IN THE 1970'S WHEN THE STREAMFLOW WAS VERY LOW. AND AS A RESULT OF THAT, THE H.C.I. METHOD WHICH RELIES ON AVERAGES WILL UNDERESTIMATE THE USABLE DEPLETIONS BECAUSE OF THAT — OF THE COINCIDENT NATURE OF THE HIGH DEPLETIONS AND THE HIGH USABILITY.

Q. AND HOW DOES THAT COMPARE TO THE H.C.I. METHOD?

A. THE H.C.I. METHOD RELIES ON AVERAGES. SO THAT DURING THAT PERIOD, BECAUSE IT IS USING AN AVERAGE CONDITION, WILL UNDERESTIMATE THE AMOUNT OF USABLE DEPLETIONS DURING THE PERIOD WHERE THE USABILITY WAS VERY HIGH.

SPECIAL MASTER: H.C.I. WAS THE ORIGINAL METHODOLOGY SUGGESTED BY MR. DURBIN?

THE WITNESS: YES.

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[Pages 132-33]

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SPECIAL MASTER: BOTH MR. HELTON AND MR. SCHROEDER HAVE TALKED ABOUT INCREASED

THIRST FOR RECHARGE AS A RESULT OF THE INCREASED PUMPING IN KANSAS.

DO YOU HAVE A COMMENT ON THAT?

THE WITNESS: WELL, I THINK EXHIBIT 698 TENDS TO GO TO THAT ISSUE FROM THE STANDPOINT — AS I UNDERSTAND SOME OF THE CRITICISM — A LOT OF IT IS FOCUSED ON THE LATE PORTION OF THE STUDY PERIOD. AND THE POINT THAT I WANTED TO MAKE WITH EXHIBIT 698 WAS, SO FAR AS 1975, YOU COULD USE EITHER METHOD AND GET VERY COMPARABLE AMOUNTS, DEPLETIONS TO USABLE FLOWS.

THE SECOND POINT THAT I WANTED TO MAKE WAS THAT THE USABILITY IN THE LATE 1970'S, IN MY VIEW, WAS VERY HIGH, NO MATTER HOW YOU EXAMINED IT. THE STREAMFLOWS WERE VERY, VERY LOW. AND AS A CONSEQUENCE, USABILITY OF WATER IN KANSAS WOULD BE VERY, VERY HIGH. AND BECAUSE THAT IS COINCIDENT WITH THE PERIOD WITH BOTH ANALYSES — THAT IS THE ANALYSES PRESENTED BY COLORADO AND THE ANALYSES WE CONDUCTED USING THE HYDROLOGIC-INSTITUTIONAL MODEL — SHOW THE HIGHEST LEVEL OF DEPLETION. I THINK IT IS CLEAR THERE ARE GOING TO BE SIGNIFICANT DEPLETIONS DURING THAT PERIOD. AND BECAUSE THE AVERAGING METHOD OF H.C.I. USES AN AVERAGE DURING THAT PERIOD, THAT EXPLAINS WHY WE GET A DIFFERENCE WHEN WE USE THE SPRONK METHOD. AND SO I THINK MY RESPONSE TO THAT WOULD BE THAT THE USABILITY DURING THAT PERIOD WAS VERY HIGH IRRESPECTIVE OF THOSE KINDS OF CONCERNS.

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Appendix Item 29

Excerpt from R. vol. 128

September 24, 1992

(Cross-examination of Steve Larson)

[Pages 107-108]

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SPECIAL MASTER: IS THAT CORRECT, YOU HAVE SUCH A GENERAL SENSE IN MIND?

THE WITNESS: YES, I HAVE A GENERAL SENSE.

SPECIAL MASTER: THEN I THINK SHE WANTS TO KNOW WHAT IT IS.

THE WITNESS: I THINK YOU CAN SEE BY LOOKING AT THOSE RELATIVE SENSITIVITIES THAT THE SENSITIVITY OF DEPLETIONS TO PARAMETER CHANGES IS SIGNIFICANTLY LESS THAN THE SENSITIVITY OF STATE LINE FLOWS. SO MY SENSE WOULD BE THAT THE UNCERTAINTY IN DEPLETIONS WOULD BE MUCH LOWER THAN THE UNCERTAINTY IN THE STATE LINE FLOWS.

BY MS. WEISS:

Q. WELL, DID YOU THINK DEPLETIONS ARE CALCULATED WITHIN A RANGE OF PLUS OR MINUS 5O PERCENT?

A. I HAVEN'T QUANTIFIED IT.

Q. I UNDERSTAND.

A. BUT I THINK IT IS LESS THAN THAT.

Q. LESS THAN 50 PERCENT?

A. YES.

Q. DO YOU THINK IT IS LESS THAN 20 PERCENT?

A. I'M NOT SURE.

Q. WHAT IS YOUR REACTION TO 10 PERCENT?

A. I'M NOT SURE THERE, EITHER.

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Appendix Item 30

Questions Presented, New Mexico's Brief in Support of Exceptions (Dec. 2, 1982), *Texas v. New Mexico*, 462 U.S. 554 (1983) (No. 65, Original) (excerpt)

IN THE

Supreme Court of the United States

OCTOBER TERM, 1982

No. 65, Original

STATE OF TEXAS,

Plaintiff

v.

STATE OF NEW MEXICO,

Defendant

UNITED STATES OF AMERICA,

Intervenor

BRIEF IN SUPPORT OF EXCEPTIONS

QUESTIONS PRESENTED

1. Whether the Court may rewrite the voting provisions of Article V of the Pecos River Compact to provide for a tie-breaker, thus diluting the voting strength of the party states, eliminating the Compact's requirement of unanimity and foreclosing the right of each state to veto Commission action.

2. Whether the Court should review findings of fact the Commission made in 1962 where Texas, the plaintiff, disputes their validity and the validity of the Review of Basic Data on which they are based.