

COLORADO *v.* NEW MEXICO ET AL.

ON EXCEPTIONS TO REPORT OF SPECIAL MASTER

No. 80, Orig. Argued January 9, 1984—Decided June 4, 1984

In this original action, Colorado seeks an equitable apportionment of the waters of the Vermejo River, which originates in Colorado and flows into New Mexico. Historically, all of the river's waters have been used exclusively by farm and industrial users in New Mexico. After a trial at which both States presented extensive evidence, the Special Master recommended that Colorado be allowed to divert 4,000 acre-feet of water per year. His recommendation rested on the grounds that New Mexico could compensate for some or all of the proposed Colorado diversion through reasonable water conservation measures, and that the injury, if any, to New Mexico would be outweighed by the benefit to Colorado from the diversion. In considering New Mexico's exceptions to the Master's report, this Court held, *inter alia*, that the Master properly did not focus exclusively on the priority of uses along the river, and that other factors—such as waste, availability of reasonable conservation measures, and the balance of benefit and harm from diversion—could be considered in the apportionment calculus. 459 U. S. 176. The case was remanded to the Master for additional specific findings to assist the Court in assessing whether the river's waters could reasonably be made available for diversion and in balancing the benefit and harm from diversion. On the basis of the evidence previously received, the Master then developed additional factual findings and reaffirmed his original recommendation. New Mexico again filed exceptions to the Master's report.

Held:

1. In this action for equitable apportionment, Colorado's proof is to be judged by a clear-and-convincing-evidence standard. Requiring Colorado to present such evidence in support of its proposed diversion is necessary to appropriately balance the unique interests involved in water rights disputes between sovereigns. The standard reflects this Court's long-held view that a proposed diverter should bear most, though not all, of the risks of erroneous decision. In addition, the standard accommodates society's competing interests in increasing the stability of property rights and in putting resources to their most efficient uses. Pp. 315–317.

2. Colorado has not met its burden of proving that a diversion should be permitted. Pp. 317–323.

(a) Colorado has not demonstrated, by clear and convincing evidence, that reasonable conservation measures could compensate for

some or all of the proposed diversion. For example, though Colorado alleged that New Mexico could improve its administration of water supplies, it did not point to specific measures New Mexico could take to conserve water. Society's interest in minimizing erroneous decisions in equitable apportionment cases requires that hard facts, not suppositions or opinions, be the basis for interstate diversions. Moreover, there is no evidence that Colorado has undertaken reasonable steps to minimize the amount of the diversion that will be required. Pp. 317-321.

(b) Nor has Colorado sustained its burden of showing that any injury to New Mexico would be outweighed by the benefits to Colorado from the proposed diversion. Colorado has not committed itself to any specific long-term use for which future benefits can be studied and predicted. By contrast, New Mexico has attempted to identify the harms that would result from the proposed diversion. Asking for absolute precision in forecasts about the benefits and harms of a diversion would be unrealistic, but a State proposing a diversion must conceive and implement some type of long-range planning and analysis of the diversion it proposes, thereby reducing the uncertainties with which equitable apportionment judgments are made. Pp. 321-323.

(c) The mere fact that the Vermejo River originates in Colorado does not automatically entitle Colorado to a share of the river's waters. Equitable apportionment of appropriated water rights turns on the benefits, harms, and efficiencies of competing uses, and thus the source of the river's waters is essentially irrelevant to the adjudication of these sovereigns' competing claims. P. 323.

Exceptions sustained and case dismissed.

O'CONNOR, J., delivered the opinion of the Court, in which BURGER, C. J., and BRENNAN, WHITE, MARSHALL, BLACKMUN, POWELL, and REHNQUIST, JJ., joined. STEVENS, J., filed a dissenting opinion, *post*, p. 324.

Richard A. Simms argued the cause for defendants. With him on the briefs were *Paul G. Bardacke*, Attorney General of New Mexico, *pro se*, and *Peter T. White* and *Jay F. Stein*, Special Assistant Attorneys General.

Robert F. Welborn, Special Assistant Attorney General of Colorado, argued the cause for plaintiff. With him on the brief were *Duane Woodard*, Attorney General, and *William A. Paddock*, First Assistant Attorney General.

JUSTICE O'CONNOR delivered the opinion of the Court.

In this original action, the State of Colorado seeks an equitable apportionment of the waters of the Vermejo River, an interstate river fully appropriated by users in the State of New Mexico. A Special Master, appointed by this Court, initially recommended that Colorado be permitted a diversion of 4,000 acre-feet per year. Last Term, we remanded for additional factual findings on five specific issues. 459 U. S. 176 (1982). The case is before us again on New Mexico's exceptions to these additional findings. We now conclude that Colorado has not demonstrated by clear and convincing evidence that a diversion should be permitted. Accordingly, we sustain New Mexico's exceptions and dismiss the case.

I

The facts of this litigation were set forth in detail in our opinion last Term, see *id.*, at 178-183, and we need recount them here only briefly. The Vermejo River is a small, non-navigable stream, originating in the snow belt of the Rocky Mountains. The river flows southeasterly into New Mexico for roughly 55 miles before feeding into the Canadian River. Though it begins in Colorado, the major portion of the Vermejo River is located in New Mexico. Its waters historically have been used exclusively by farm and industrial users in that State.

In 1975, however, a Colorado corporation, Colorado Fuel and Iron Steel Corp. (C. F. & I.), proposed to divert water from the Vermejo River for industrial and other uses in Colorado. As a consequence, several of the major New Mexico users sought and obtained an injunction against the proposed diversion. The State of Colorado, in turn, filed a motion for leave to file an original complaint with this Court, seeking an equitable apportionment of the Vermejo River's waters. We granted Colorado its leave to file, 439 U. S. 975 (1978), and the Court of Appeals for the Tenth Circuit stayed C. F. & I.'s appeal pending our resolution of the equitable apportionment issue.

We then appointed a Special Master, 441 U. S. 902 (1979), the Honorable Ewing T. Kerr, Senior Judge of the United States District Court for the District of Wyoming, who held a lengthy trial at which both States presented extensive evidence. On the basis of this evidence, the Master recommended that Colorado be allowed to divert 4,000 acre-feet of water per year. His recommendation rested on two grounds: first, that New Mexico could compensate for some or all of the Colorado diversion through reasonable water conservation measures; and second, that the injury, if any, to New Mexico would be outweighed by the benefit to Colorado from the diversion.

New Mexico took exceptions, both legal and factual, to the Master's recommendation. As to the Master's view of the law of equitable apportionment, New Mexico contended that the Master erred in not focusing exclusively on the priority of uses along the Vermejo River. 459 U. S., at 181-182. The Court rejected that contention:

"We recognize that the equities supporting the protection of existing economies will usually be compelling. . . . Under some circumstances, however, the countervailing equities supporting a diversion for future use in one State may justify the detriment to existing users in another State. This may be the case, for example, where the State seeking a diversion demonstrates by clear and convincing evidence that the benefits of the diversion substantially outweigh the harm that might result. In the determination of whether the State proposing the diversion has carried this burden, an important consideration is whether the existing users could offset the diversion by reasonable conservation measures" *Id.*, at 187-188 (footnote omitted).

In short, though the equities presumptively supported protection of the established senior uses, the Court concluded that other factors—such as waste, availability of reasonable

conservation measures, and the balance of benefit and harm from diversion—could be considered in the apportionment calculus. *Ibid.*

New Mexico also took issue with the factual predicates of the Master's recommendation. Specifically, it contended that Colorado had failed to prove by clear and convincing evidence that New Mexico currently uses more than its equitable share of the Vermejo River's waters. On this matter, we found the Master's report unclear and determined that a remand would be appropriate.

To help this Court assess whether Vermejo River water could reasonably be made available for diversion, the Master was instructed to make specific findings concerning:

"(1) the existing uses of water from the Vermejo River, and the extent to which present levels of use reflect current or historical water shortages or the failure of existing users to develop their uses diligently;

"(2) the available supply of water from the Vermejo River, accounting for factors such as variations in stream flow, the needs of current users for a continuous supply, the possibilities of equalizing and enhancing the water supply through water storage and conservation, and the availability of substitute sources of water to relieve the demand for water from the Vermejo River; [and]

"(3) the extent to which reasonable conservation measures in both States might eliminate waste and inefficiency in the use of water from the Vermejo River[.]" *Id.*, at 189–190.

Then, to assist this Court in balancing the benefit and harm from diversion, the Master was asked to make findings concerning:

"(4) the precise nature of the proposed interim and ultimate use in Colorado of water from the Vermejo River,

and the benefits that would result from a diversion to Colorado; [and]

"(5) the injury, if any, that New Mexico would likely suffer as a result of any such diversion, taking into account the extent to which reasonable conservation measures could offset the diversion." *Id.*, at 190 (footnote omitted).

Finally, the Court authorized the Master to consider any other relevant factors, to gather any additional evidence necessary to making the requested findings, and to offer another—although not necessarily different—recommendation. *Id.*, at 190, and n. 14.

On remand, New Mexico filed a motion to submit new evidence. Colorado opposed the motion and attested that, unless the record were reopened, it did not intend to offer any additional evidence in support of its case. The Special Master denied New Mexico's motion. Then, on the basis of the evidence previously received, he developed additional factual findings and reaffirmed his original recommendation.

II

Last Term, because our initial inquiry turned on the factors relevant to determining a just apportionment, the Court explained in detail the law of equitable apportionment. This Term, because our inquiry turns on the evidentiary material Colorado has offered in support of its complaint, we find it necessary to explain the standard by which we judge proof in actions for equitable apportionment.

The function of any standard of proof is to "instruct the factfinder concerning the degree of confidence our society thinks he should have in the correctness of factual conclusions for a particular type of adjudication." *In re Winship*, 397 U. S. 358, 370 (1970) (Harlan, J., concurring). By informing the factfinder in this manner, the standard of proof allocates the risk of erroneous judgment between the litigants and in-

dicates the relative importance society attaches to the ultimate decision. See *Addington v. Texas*, 441 U. S. 418, 423-425 (1979).

Last Term, the Court made clear that Colorado's proof would be judged by a clear-and-convincing-evidence standard. *Colorado v. New Mexico*, 459 U. S., at 187-188, and n. 13. In contrast to the ordinary civil case, which typically is judged by a "preponderance of the evidence" standard, we thought a diversion of interstate water should be allowed only if Colorado could place in the ultimate factfinder an abiding conviction that the truth of its factual contentions are "highly probable." See C. McCormick, *Law of Evidence* § 320, p. 679 (1954). This would be true, of course, only if the material it offered instantly tilted the evidentiary scales in the affirmative when weighed against the evidence New Mexico offered in opposition. See generally McBaine, *Burden of Proof: Degrees of Belief*, 32 Calif. L. Rev. 242, 251-254 (1944).

Requiring Colorado to present clear and convincing evidence in support of its proposed diversion is necessary to appropriately balance the unique interests involved in water rights disputes between sovereigns. The standard reflects this Court's long-held view that a proposed diverter should bear most, though not all, of the risks of erroneous decision: "The harm that may result from disrupting established uses is typically certain and immediate, whereas the potential benefits from a proposed diversion may be speculative and remote." *Colorado v. New Mexico*, 459 U. S., at 187; see also *id.*, at 182, n. 9. In addition, the clear-and-convincing-evidence standard accommodates society's competing interests in increasing the stability of property rights and in putting resources to their most efficient uses: "[T]he rule of priority [will] not be strictly applied where it 'would work more hardship' on the junior user 'than it would bestow benefits' on the senior user . . . [though] the equities supporting the protection of existing economies will usually be compel-

ling.” *Id.*, at 186–187 (quoting *Nebraska v. Wyoming*, 325 U. S. 589, 619 (1945)). In short, Colorado’s diversion should and will be allowed only if actual inefficiencies in present uses or future benefits from other uses are highly probable.

III

With these principles in mind, we turn to review the evidence the parties have submitted concerning the proposed diversion. As our opinion noted last Term, New Mexico has met its initial burden of showing “real or substantial injury” because “*any* diversion by Colorado, unless offset by New Mexico at its own expense, [would] necessarily reduce the amount of water available to New Mexico users.” 459 U. S., at 188, n. 13. Accordingly, the burden shifted on remand to Colorado to show, by clear and convincing evidence, that reasonable conservation measures could compensate for some or all of the proposed diversion and that the injury, if any, to New Mexico would be outweighed by the benefits to Colorado from the diversion. Though the Master’s findings on these issues deserve respect and a tacit presumption of correctness, the ultimate responsibility for deciding what are correct findings of fact remains with us. See *Mississippi v. Arkansas*, 415 U. S. 289, 291–292, 294 (1974); C. Wright, A. Miller, & E. Cooper, *Federal Practice and Procedure* § 4054, pp. 196–197 (1978). Upon our independent review of the record, we find that Colorado has failed to meet its burden.

A

To establish whether Colorado’s proposed diversion could be offset by eliminating New Mexico’s nonuse or inefficiency, we asked the Master to make specific findings concerning existing uses, supplies of water, and reasonable conservation measures available to the two States. After assessing the evidence both States offered about existing uses and available supplies, the Master concluded that “current levels of use primarily reflect failure on the part of existing users to

fully develop and put to work available water.” Additional Factual Findings 28. Moreover, with respect to reasonable conservation measures available, the Master indicated his belief that more careful water administration in New Mexico would alleviate shortages from unregulated stockponds, fishponds, and water detention structures, prevent waste from blockage and clogging in canals, and ensure that users fully devote themselves to development of available resources. He further concluded that “the heart of New Mexico’s water problem is the Vermejo Conservancy District,” *id.*, at 20, which he considered a failed “reclamation project [that had] never lived up to its expectations or even proved to be a successful project, . . . and [that] quite possibly should never have been built.” *Id.*, at 8. Though the District was quite arguably in the “middle range in reclamation project efficiencies,” *id.*, at 20, the Master was of the opinion “that [the District’s] inefficient water use should not be charged to Colorado.” *Ibid.* Furthermore, though Colorado had not submitted evidence or testimony of any conservation measures that C. F. & I. would take, the Master concluded that “it is not for the Master or for New Mexico to say that reasonable attempts to conserve water will not be implemented by Colorado.” *Id.*, at 21.

We share the Master’s concern that New Mexico may be overstating the amount of harm its users would suffer from a diversion. Water use by appropriators along the Vermejo River has remained relatively stable for the past 30 years, and this historic use falls substantially below the decreed rights of those users. Unreliable supplies satisfactorily explain some of this difference, but New Mexico’s attempt to excuse three decades of nonuse in this way is, at the very least, suspect. Nevertheless, whatever the merit of New Mexico’s explanation, we cannot agree that Colorado has met its burden of identifying, by clear and convincing evidence, conservation efforts that would preserve any of the Vermejo River water supply.

For example, though Colorado alleged that New Mexico could improve its administration of stockponds, fishponds, and water detention structures, it did not actually point to specific measures New Mexico could take to conserve water. Thus, ultimately all the Master could conclude was that some unspecified "[r]eduction and/or regulation . . . could not help but be an effort, however small, to conserve the water supply. . . ." *Id.*, at 18. Similarly, though Colorado asserted that more rigorous water administration could eliminate blocked diversion works and ensure more careful development of water supplies, it did not show how this would actually preserve existing supplies. Even if Colorado's generalizations were true, they would prove only that some junior users are diverting water that senior appropriators ultimately could call; they would not prove that water is being wasted or used inefficiently by those actually diverting it. In short, the administrative improvements Colorado suggests are either too general to be meaningful or involve redistribution, as opposed to preservation, of water supplies.

Colorado's attack on current water use in the Vermejo Conservancy District is inadequate for much the same reason. Our cases require only conservation measures that are "financially and physically feasible" and "within practicable limits." See, e. g., *Colorado v. New Mexico*, 459 U. S., at 192; *Wyoming v. Colorado*, 259 U. S. 419, 484 (1922). New Mexico submitted substantial evidence that the District is in the middle of reclamation project efficiencies and that the District has taken considerable independent steps—including, the construction, at its own expense and on its own initiative, of a closed stockwater delivery system—to improve the efficiency of its future water use. Additional Factual Findings 20. The Master did not find to the contrary; indeed, he commended New Mexico for the substantial efforts it had taken. See *ibid.* Nevertheless, he accepted Colorado's general assertion that the District was not as efficient as other reclamation projects and concluded that New Mexico's

inefficient use should not be charged to Colorado. But Colorado has not identified any "financially and physically feasible" means by which the District can further eliminate or reduce inefficiency and, contrary to the Master's suggestion, we believe that the burden is on Colorado to do so. A State can carry its burden of proof in an equitable apportionment action only with specific evidence about how existing uses might be improved, or with clear evidence that a project is far less efficient than most other projects. Mere assertions about the relative efficiencies of competing projects will not do.

Finally, there is no evidence in the record that "Colorado has undertaken reasonable steps to minimize the amount of the diversion that will be required." *Colorado v. New Mexico*, *supra*, at 186. Nine years have passed since C. F. & I. first proposed diverting water from the Vermejo River. Yet Colorado has presented no evidence concerning C. F. & I.'s inability to relieve its needs through substitute sources. Furthermore, there is no evidence that C. F. & I. has settled on a definite or even tentative construction design or plan, or that it has prepared an economic analysis of its proposed diversion. Indeed, C. F. & I. has not even conducted an operational study of the reservoir that Colorado contends will be built in conjunction with the proposed diversion. It may be impracticable to ask the State proposing a diversion to provide unerring proof of future uses and concomitant conservation measures that would be taken. But it would be irresponsible of us to apportion water to uses that have not been, at a minimum, carefully studied and objectively evaluated, not to mention decided upon. Financially and physically feasible conservation efforts include careful study of future, as well as prudent implementation of current, water uses. Colorado has been unwilling to take any concrete steps in this direction.

Society's interest in minimizing erroneous decisions in equitable apportionment cases requires that hard facts, not

suppositions or opinions, be the basis for interstate diversions. In contrast to JUSTICE STEVENS, we do not believe Colorado has produced sufficient facts to show, by clear and convincing evidence, that reasonable conservation efforts will mitigate sufficiently the injury that New Mexico successfully established last Term that it would suffer were a diversion allowed. No State can use its lax administration to establish its claim to water. But once a State successfully proves that a diversion will cause it injury, the burden shifts to the diverter to show that reasonable conservation measures exist. Colorado has not carried this burden.

B

We also asked the Master to help us balance the benefits and harms that might result from the proposed diversion. The Master found that Colorado's proposed interim use is agricultural in nature and that more permanent applications might include use in coal mines, timbering, power generation, domestic needs, and other industrial operations. The Master admitted that "[t]his area of fact finding [was] one of the most difficult [both] because of the necessarily speculative nature of [the] benefits . . ." and because of Colorado's "natural reluctance to spend large amounts of time and money developing plans, operations, and cost schemes" Additional Factual Findings 23. Nevertheless, because the diverted water would, at a minimum, alleviate existing water shortages in Colorado, the Master concluded that the evidence showed considerable benefits would accrue from the diversion. Furthermore, the Master concluded that the injury, if any, to New Mexico would be insubstantial, if only because reasonable conservation measures could, in his opinion, offset the entire impact of the diversion. *Id.*, at 24-28.

Again, we find ourselves without adequate evidence to approve Colorado's proposed diversion. Colorado has not committed itself to any long-term use for which future benefits can be studied and predicted. Nor has Colorado specified

how long the interim agricultural use might or might not last. All Colorado has established is that a steel corporation wants to take water for some unidentified use in the future.

By contrast, New Mexico has attempted to identify the harms that would result from the proposed diversion. New Mexico commissioned some independent economists to study the economic effects, direct and indirect, that the diversion would have on persons in New Mexico. The study these economists produced was submitted at the original hearing, conducted prior to the remand, as evidence of the injury that would result from the reduction in water supplies. No doubt, this economic analysis involves prediction and forecast. But the analysis is surely no more speculative than the generalizations Colorado has offered as "evidence." New Mexico, at the very least, has taken concrete steps toward addressing the query this Court posed last Term. Colorado has made no similar effort.

Colorado objects that speculation about the benefits of future uses is inevitable and that water will not be put to its best use if the expenditures necessary to development and operation must be made without assurance of future supplies. We agree, of course, that asking for absolute precision in forecasts about the benefits and harms of a diversion would be unrealistic. But we have not asked for such precision. We have only required that a State proposing a diversion conceive and implement some type of long-range planning and analysis of the diversion it proposes. Long-range planning and analysis will, we believe, reduce the uncertainties with which equitable apportionment judgments are made. If New Mexico can develop evidence to prove that its existing economy is efficiently using water, we see no reason why Colorado cannot take similar steps to prove that its future economy could do better.

In the nine years that have passed since C. F. & I. first requested a diversion, neither it nor Colorado has decided upon a permanent use for the diverted water. It therefore is

no surprise that Colorado cannot conduct studies or make predictions about the benefits and harms of its proposed diversion. Under the clear-and-convincing-evidence standard, it is Colorado, and not New Mexico, that must bear the risk of error from the inadequacy of the information available.

C

As a final consideration, the Master pointed out that approximately three-fourths of the water in the Vermejo River system is produced in Colorado. He concluded, therefore, that "the equities are with Colorado, which requests only a portion of the water which it produces." Additional Factual Findings 29. Last Term, the Court rejected the notion that the mere fact that the Vermejo River originates in Colorado automatically entitles Colorado to a share of the river's waters. *Colorado v. New Mexico*, 459 U. S., at 181, n. 8. Both Colorado and New Mexico recognize the doctrine of prior appropriation, *id.*, at 179, and appropriative, as opposed to riparian, rights depend on actual use, not land ownership. See *id.*, at 179, n. 4. It follows, therefore, that the equitable apportionment of appropriated rights should turn on the benefits, harms, and efficiencies of competing uses, and that the source of the Vermejo River's waters should be essentially irrelevant to the adjudication of these sovereigns' competing claims. *Id.*, at 181, n. 8. To the extent the Master continued to think the contrary, he was in error.

IV

We continue to believe that the flexible doctrine of equitable apportionment extends to a State's claim to divert previously appropriated water for future uses. But the State seeking such a diversion bears the burden of proving, by clear and convincing evidence, the existence of certain relevant factors. The complainant must show, for example, the extent to which reasonable conservation measures can adequately compensate for the reduction in supply due to the

STEVENS, J., dissenting

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diversion, and the extent to which the benefits from the diversion will outweigh the harms to existing users. This evidentiary burden cannot be met with generalizations about unidentified conservation measures and unstudied speculation about future uses. The Special Master struggled, as best he could, to balance the evidentiary requirement against the inherent limitations of proving a beneficial future use. However, we do not find enough evidence to sustain his findings. Until Colorado can generate sufficient evidence to show that circumstances have changed and that a diversion is appropriate, the equities compel the continued protection of the existing users of the Vermejo River's waters.

Accordingly, we sustain the State of New Mexico's exceptions to the Special Master's Report and Additional Factual Findings, and dismiss the case.

It is so ordered.

JUSTICE STEVENS, dissenting.

The Special Master has recommended the entry of a decree that would establish a diversion point in the Rocky Mountains and allow Colorado to divert no more than 4,000 acre-feet of water from the Vermejo River at that point; the diverted flow would make an intermountain transfer to supplement the presently inadequate flow of the Purgatoire River in Colorado. Accretions to the Vermejo below the diversion point, as well as the remainder of the original flow, would be available for the four principal users of the Vermejo River. Those four users are all in New Mexico and, of course, are upstream from the point where the Vermejo flows into the Canadian River.

A gauge that is located between the second and third of those four users has measured the flow of the Vermejo since 1916. The average annual flow of the river at that point since 1921 is 12,800 acre-feet; if the highest flow years are eliminated, the average is 10,900 acre-feet; if just the 1970's, which included especially dry years, are considered, the aver-

age is 8,262 acre-feet. No matter which figure is used, the Master's findings make it perfectly clear that the supply will remain adequate to satisfy the needs of the first three of the four principal appropriators on the river. *Colorado v. New Mexico*, 459 U. S. 176, 180 (1982) (hereinafter *Colorado I*). The critical dispute concerns the impact of the proposed diversion on the fourth—the Vermejo Conservancy District.

As the Court noted last Term, the Special Master's recommendation rested on "two alternative grounds: first, that New Mexico could compensate for some or all the Colorado diversion through reasonable water conservation measures; and second, that the injury, if any, to New Mexico would be outweighed by the benefit to Colorado from the diversion." *Id.*, at 181. Neither last Term, nor today, has the Court questioned the legal sufficiency of either of those grounds. Last Term, however, we requested the Master to provide us with additional factual findings; today the Court decides that the evidence does not support either of the Master's conclusions.

I respectfully disagree with the Court's treatment of two questions of law as well as with its evaluation of the facts.

I

The Court carefully explains why it has concluded that Colorado's proof should be judged by a clear-and-convincing-evidence standard. Inasmuch as this is the standard that the Special Master applied, that explanation is somewhat academic. The more troublesome question is what standard the Court should apply when it reviews 28 pages of detailed findings of fact by the judge whom we entrusted to conduct the lengthy trial in this case.

In the exercise of our original jurisdiction it may well be appropriate for us to make a *de novo* review of the record. The Master's report is, after all, merely a recommendation and there is no rule of law that requires us to accord it any special deference. I do not think that it would be appropri-

ate in our original jurisdiction cases to accord the same degree of deference that Federal Rule of Civil Procedure 52(a) directs appellate judges to accord to the findings of fact made by district judges in ordinary litigation. Nevertheless, in my view, the cause of justice is more likely to be well served by according considerable deference to the Master's factual determinations. The record in cases such as this is typically lengthy, technical, and complex. The testimony and accompanying exhibits are much more difficult to assimilate and fully comprehend from the cold record than in the living trial, and of course we do not have the opportunity to make assessments of the demeanor of the witnesses.

The majority repeatedly states that it cannot "find enough evidence" to sustain the Master's findings. *E. g.*, *ante*, at 324. Based upon my examination of the trial testimony and exhibits presented to the Special Master, the majority's search for the evidence must have been cursory indeed. On its face, the majority opinion does not review the *evidence* in the case; instead it reviews the Special Master's findings, and in the process of doing so makes general observations regarding the evidence.¹

If the Court gave the Special Master's report the respect that I regard as its due—rather than merely paying lip-service to a "tacit presumption of correctness" *ante*, at 317—I believe it would reach the conclusion that his recommendation is fully supported by his detailed findings and that those findings are fully supported by the evidence.

¹The majority does make a vague reference to certain economic studies commissioned by New Mexico. *Ante*, at 322. It is unclear, however, whether the majority actually relies on the substance of this evidence at all. Instead, we are told that New Mexico has "attempted to identify harms that would result" and has taken "concrete steps toward addressing the query this Court posed last Term." *Ibid.* It seems to matter little whether New Mexico has failed in this regard, because its analysis is "no more speculative" than Colorado's evidence. *Ibid.* The majority nevertheless gives New Mexico an "A for effort," as it were, whereas Colorado is seemingly penalized because it "has made no similar effort," *ibid.*

II

As THE CHIEF JUSTICE emphasized in his concurring opinion when the case was here last Term, "these two States come to the Court on equal footing." 459 U. S., at 191. Colorado is not entitled to any priority simply because the river originates in Colorado, and New Mexico is not entitled to an undiminished flow simply because of its first use. *Ibid.* We must balance the equities of the competing claims as they existed at the time this controversy began. Neither party should be permitted to improve its legal position by making changes in its use of the river's waters after our jurisdiction was invoked.

Once these principles are recognized, the "remaining questions are largely matters of fact. The evidence is voluminous, some of it highly technical and some quite conflicting. It has all been considered. The reasonable limits of an opinion do not admit of its extended discussion. We must be content to give our conclusions on the main questions and make such references to and comment on what is evidential as will point to the grounds on which the conclusions on those questions rest. As to minor questions we can only state the ultimate facts as we find them from the evidence." *Wyoming v. Colorado*, 259 U. S. 419, 471 (1922).

The first of the two alternative grounds supporting the Master's recommendation is that "New Mexico could compensate for some or all the Colorado diversion through reasonable water conservation measures," *Colorado I*, 459 U. S., at 181.

From the outset of the litigation, Colorado has claimed that New Mexico's use of the Vermejo's waters has been wasteful and inefficient. Colorado argues that one "fact" it has stressed throughout the litigation is that "a closed stock and domestic water system could eliminate the waste of over 2,000 acre-feet annually." Brief for Colorado 41, n. 20, 43-45. This fact—which is essentially undisputed—should be "hard" enough even for the majority, and provides irre-

futable support for the conclusion that there was a significant amount of waste in the District when the lawsuit began.²

The Court sidesteps this point, accepting New Mexico's argument that the benefits of this system should inure solely to the benefit of New Mexico. But New Mexico simply continues to cling to the position that it should not be required to employ conservation measures to facilitate Colorado's proposed uses, notwithstanding the fact that we explicitly rejected this position last Term, 459 U. S., at 185-186, and in doing so quoted the following language from our seminal decision in this area:

"The question here is not what one State should do for the other, but how each should exercise her relative rights in the waters of this interstate stream. . . . Both subscribe to the doctrine of appropriation, and by that doctrine rights to water are measured by what is reasonably required and applied. Both States recognize that conservation within practicable limits is essential in order that needless waste may be prevented and the largest feasible use may be secured. This comports with the all-pervading spirit of the doctrine of appropriation and takes appropriate heed of the natural necessities out of which it arose. We think that doctrine lays on each of these States a duty to exercise her right reason-

² Colorado further argues that the diversion it seeks would be totally offset by this savings. The argument is based on the fact that the saving of 2,000 acre-feet is realized at the reservoirs in the District, and that there is a significant loss of water during its transit from the river to the reservoirs, and also resulting from evaporation from the reservoirs. Thus, according to Colorado, an increase of 2,000 acre-feet of water in the reservoirs would offset a much larger diversion from the river itself. One need not fully accept this argument to recognize that the recommended 4,000 acre-feet diversion upstream would produce a significantly lower net loss at the reservoirs, or—more significantly—that when the complaint was filed, at least 2,000 acre-feet of water were being wasted by just one of the four principal users in New Mexico.

ably and in a manner calculated to conserve the common supply." *Wyoming v. Colorado*, 259 U. S., at 484.

New Mexico argues that the "important factor to consider in regard to the closed domestic and stockwater system is the timing." Reply Brief for New Mexico 23. It appears that before this controversy arose, water users in the area "began discussing the possibility of building a stockwater distribution system that could save the water necessarily lost" by using the open canals, and a cooperative of water users was formed to investigate "possible solutions." *Ibid.* (citing N. M. Ex. No. E-3). Although the users apparently recognized and considered the need to eliminate this waste before this controversy began, Tr. 2765, New Mexico did not take any action to eliminate the waste inherent in the District's 60-mile network of open canals until after CF&I generated this controversy in 1975 by obtaining a conditional right to divert water from the Vermejo River. We will never know if this waste would have been eliminated but for the existence of this lawsuit; we do know, however, that the water was still being wasted at the time this action was commenced.

With respect to the Vermejo Conservancy District—which of course is the only New Mexico user whose water supply might be impaired by the proposed diversion—the Master found:

"At the heart of New Mexico's water problem is the Vermejo Conservancy District. Whether lack of administration, lack of diligence, lack of resources or lack of ability is the cause, there is little doubt that the District has failed as a water reclamation project and has serious financial and operational problems of its own. (Tr. 164-169). Several of the conservation problems already discussed are present in the District. Furthermore, there is a problem of loss through evaporation in the District's seven reservoirs. (Tr. 863, 1296-1299). The District has a 32% efficiency to farm headgates and

an overall system efficiency of 24.6%. (Tr. 2576). New Mexico claims that the District falls middle range in reclamation project efficiencies. (Tr. 1410-1411). However, the existence of other low efficiency systems is not justification for failure to fully develop water sources here. New Mexico argues that Colorado has merely pointed out areas of inefficient water use without making viable suggestions which would reduce or eliminate the inefficiency. It is the opinion of the Master that New Mexico's inefficient water use should not be charged to Colorado." Additional Factual Findings 20.

The majority asserts that the "District was quite arguably in the 'middle range in reclamation project efficiencies,'" *ante*, at 318 (quoting Additional Factual Findings 20). See also *ante*, at 319 ("New Mexico submitted substantial evidence that the District is in the middle [range] . . ."). The Master did not find that the District was within the middle range of efficiencies; he simply observed that New Mexico claimed that was so. The majority cannot bring itself to find in favor of New Mexico on this point, and given the evidence on the issue, that is understandable. One expert witness simply stated: "I know of many systems in which the efficiency is in this neighborhood 30 to 40 percent. . . . I know of systems who have lower efficiencies simply because they cannot divert the available supply." Tr. 1410-1411. When asked if he recalled the testimony of another expert that inefficiencies in that range could not be tolerated in the arid area, the witness responded: "I think he mentioned it would be prudent to make better use of the water supply." *Id.*, at 1411. Other evidence was offered by New Mexico in support of its claim that its efficiency was in the middle range, *id.*, at 2720-2722, but the methodology of this evidence was highly questionable, *id.*, at 2730-2746, and one expert testified that the District was "extremely inefficient" and "less efficient than any system in Colorado with which I'm familiar." *Id.*, at 2576. It was this latter testimony that the Master credited

in explicitly holding that the overall efficiency of the District was 24.6%, implicitly rejecting New Mexico's position. In light of all of the testimony, the Special Master concluded that "the existence of other low efficiency systems is not justification for failure to fully develop water sources here." Additional Factual Findings 20.

Moreover, the Master's findings plainly identify additional conservation measures that are available to New Mexico. They involve a more efficient management of the entire Vermejo River and all specific improvements at the Conservancy District.

The Master noted a marked contrast between the quality of water regulation and control in Colorado, which routinely monitors and takes affirmative measures to eliminate waste, *e. g.*, Tr. 515-524,³ and that provided by New Mexico with respect to the Vermejo River.

In New Mexico, a Water Master is appointed to administer a district if a majority of the users on the system petition the State Engineer, or the State Engineer may do so on his own. *Id.*, at 2424. A Water Master monitors actual use, assures that uses are beneficial, and takes action if there is waste. There is no Water Master for the Vermejo. Incredibly, New Mexico's answer to the lack of monitoring is simply the assertion that if one farmer "saw another wasting water the matter would be quickly resolved by the water users. Tr. 2416-2417." Reply Brief for New Mexico 22. See also Tr. 1063-1064. The New Mexico State Engineer testified:

"Even on the streams that have been adjudicated, we find it is generally not necessary to appoint a Water Master to measure the diversions and to enforce priorities and the water users themselves have generally been able to work these problems out among themselves, thus

³ It was in light of this evidence that the Special Master stated that "it is not for the Master or for New Mexico to say that reasonable attempts to conserve water will not be implemented by Colorado." Additional Factual Findings 21. See also *id.*, at 14-16.

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avoiding the onerous Water Master tax they would have to pay and the installation of meters that they would have to pay if they demanded strict priority administration.

"Now on the Vermejo we occasionally have had complaints, 'Somebody is taking water out of priority, filling the lakes when I'm senior,' things of that nature, and we have sent people over there, talked to the water users in much the same way as they talk to each other. And I think have been of some assistance to them in resolving the problem among themselves." *Id.*, at 2416-2417.

The same engineer later insisted: "[W]e do not ignore waste. We don't ignore unadjudicated uses, that is, unauthorized uses for irrigation or any other purpose," *id.*, at 2418, but later admitted he simply did "not have the staff to go out and monitor for nonuse." *Id.*, at 2426. Indeed, with his limited staff, he would not even conduct random spot checks, and instead took the position that if he could not monitor all users for nonuse, he would not check for nonuse at all, though he did leave open the possibility in case of undefined "critical circumstances" which he had "not yet encountered." *Ibid.*

New Mexico had never installed any gauges at the state line, and did not assist in the maintenance of the gauges installed by Colorado. *Id.*, at 2432-2433. The New Mexico State Engineer did not know the approximate volume of water entering New Mexico, *id.*, at 2433, was "not prepared to so agree" with projections on the effect of the diversion on the New Mexico users, *ibid.*, and was "not able to agree or disagree" with figures regarding depletions, *id.*, at 2433-2434. He explained that such figures were not necessary for New Mexico's "administration" of the water rights under the New Mexico Vermejo Decree, because his department administered the decree "[o]nly in the sense of occasional fieldtrips to determine primarily whether any un-

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authorized acreage is being irrigated. . . . But we do not administer the priorities and diversion rates adjudicated by the decree." *Id.*, at 2434. "Who does do that?" counsel asked. The State Engineer responded:

"We talked about that some. There is a working among themselves, a cooperation over there. The people work the problems out among themselves. Occasionally complaining to us. . . .

"So long as they are able to resolve them and live with it, then day-to-day administration of priorities and the rates of diversion is not necessary and not in the public interest.

"It's costly and it costs those water users when we have to undertake that kind of administration. And I think that gives them some incentive to be reasonably cooperative in working out their problems locally." *Id.*, at 2434-2435.

The problems with relying on complaints by other users are numerous and manifest. Of course, other New Mexico users would have little incentive to complain about waste by the most junior appropriator who in this case is farthest downstream—any water that reaches the District will simply flow into the Canadian River if it is not used by the District. Moreover, one wasteful user will think twice before pointing an accusatory finger at another user wasting water. Naturally without meters and without access to the other users' land, few complaints are likely. The New Mexico Engineer conceded some of these problems, but simply asserted that the District users "have a pretty good idea what is going on upstream particularly." *Id.*, at 2424.

In his additional factual findings, the Master specifically suggested the manifest deficiencies in New Mexico's administration could be remedied by "monitoring, regulating and controlling the system in an effort to determine more accurately actual use, and to decrease nonuse, waste and general

inefficiency.” Additional Factual Findings 18.⁴ There is clear and convincing evidence to support the Special Master’s findings and Colorado’s argument that “by means of lax administrative practices, New Mexico precludes a determination of precise demand and actual beneficial use.” Brief for Colorado 41.

Colorado is correct when it states: “New Mexico should not be permitted to use its own lack of administration and record keeping to establish its claim that no water can be conserved. That position, if accepted by the Court, would encourage states to obscure their water use practices and needs in order to avoid their duty to help conserve the common supply.” *Id.*, at 42. Last Term we explicitly rejected New Mexico’s inflexible interpretation of the doctrine of equitable apportionment under which priority would not merely be a guiding principle but the controlling one. 459 U. S., at 183–184. We further stated:

“Our prior cases clearly establish that equitable apportionment will protect only those rights to water that are ‘reasonably required and applied.’ *Wyoming v. Colo-*

⁴The Master further stated:

“One final problem area which the Master believes could be improved with proper administration is the failure of many users to devote sufficient time to the complete development of available water resources. Water shortages are a reality in arid western states and, therefore, water conservation is a task that must involve serious effort and attention together with large amounts of time and financial input. The Master understands the intense feelings that some of the individual users have for their land and their lifestyle (See Tr. 2192, 2206, 2215–16); the Master also understands that farming or ranching often needs to be supplemented by other sources of income and, therefore, other jobs. (See Tr. 2207). However, New Mexico users, individuals, or otherwise, cannot expect to be able to take the available water in the Vermejo River at their convenience without taking the time and energy to implement changes and development to help conserve and augment the available water. Careful monitoring and regulation as part of a program of administration would aid all users in full development of their water supply and demands.” *Id.*, at 19–20.

rado, 259 U. S. 419, 484 (1922). Especially in those Western States where water is scarce, '[t]here must be no waste . . . of the "treasure" of a river. . . . Only diligence and good faith will keep the privilege alive.' *Washington v. Oregon*, 297 U. S. 517, 527 (1936). Thus, wasteful or inefficient uses will not be protected. See *ibid.*; *Nebraska v. Wyoming*, [325 U. S.], at 618. Similarly, concededly senior water rights will be deemed forfeited or substantially diminished where the rights have not been exercised or asserted with reasonable diligence. *Washington v. Oregon*, *supra*, at 527-528; *Colorado v. Kansas*, 320 U. S. 383, 394 (1943)." *Id.*, at 184.

New Mexico's manifestly lax, indeed virtually nonexistent, administration of the Vermejo surely substantially diminishes its rights to the waters. It invites waste, and renders the amount of that waste an unknown. "Protection of existing economies does not require that users be permitted to continue in unreasonably wasteful or inefficient practices." *Id.*, at 195 (O'CONNOR, J., concurring).

Moreover, the Special Master identified further specific problems causing water shortages or loss that might be alleviated by more careful administration:

"One such problem is unregulated stockponds, fishponds and water detention structures. (Colo. Ex. Nos. 83, 40). While there is no question that such water use is to a certain extent necessary and beneficial, some sort of restrictions should apply. The numbers of ponds and other structures might be limited; when appropriate, reuse should be developed; and, the extent of water diverted to these areas should be in some way monitored or controlled. There is some indication by New Mexico that approximately 2,024 stockponds exist in Colfax County. (Defendants' Brief on Remand, p. 53). Reduction and/or regulation of some type could not help but

be an effort, however small, to conserve the water supply and put it to beneficial use.

"There is at least some evidence in reports from the Bureau of Reclamation that available runoff is not being diverted because dams and supply canals are blocked with silt and other debris. (Colo. Ex. Nos. 38, 40, 43; Tr. 2200). Proper administration would make users aware of the diversion problem and perhaps the state and its users together could find means to clean up the canals and prevent further clogging.

"Another problem contributing to water waste and inefficiency is the inability to control headgate spills, divert all the water available, and fully develop all available stream sources. (Tr. 1830-1834, 1913-1914). Perhaps repair or revision of the necessary structures is all that is needed, or perhaps resort to a project of more complicated construction is necessary. The Master does not mean to suggest that burdensome and unreasonable efforts are required to be undertaken by New Mexico; however, reasonable repair based on careful development and administration could further reduce water shortages caused by inefficiency and waste." Additional Factual Findings 18-19.

Based on his review of the entire record, the Master found:

"The Master is of the opinion that based on the evidence in its entirety, there is already sufficient water if New Mexico would take every opportunity to develop their resources fully. With proper conservation measures, there is an adequate water supply to satisfy the needs of all users." *Id.*, at 20-21.⁵

⁵ In the conclusion of the report the Master expressly stated:

"The available supply of water from the Vermejo River is sufficient for current New Mexico users, and with reasonable conservation measures would meet the needs of Colorado users as well. The available water supply can be enhanced through diligent and complete development of the Vermejo source as well as alternative sources. Many current users do not

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III

Alternatively, the Master found that the benefit to Colorado from the diversion would outweigh the injury, if any, to New Mexico. The identifiable benefits to Colorado included projected permanent uses, interim uses, and the alleviation of the existing shortages in the Purgatoire River system.

The Master found that the proposed permanent uses include

“a water powered hydroelectric plant generating power for a sawmill and related timber operations; coal washing at CF&I coal mines which would save transportation of the waste material from the mines to Pueblo, Colorado as well as development of additional coal mines; domestic and recreational purposes; possible synthetic fuel development; and, supplementation of current inadequate water supply in Colorado, including both CF&I uses as well as city and conservancy district (irrigation) shortages. (Tr. 738–749, 795–96, 623–639, 654, 656).” *Id.*, at 22.

The Master properly acknowledged that there could be no certainty that all of Colorado’s proposed uses would actually materialize, but he concluded that “if even half of them are fully implemented,” the diversion would be justified. He added:

“One of the more important uses, which is certain to occur, is that the water appropriated from the Vermejo

require a continuous supply and systems of reservoirs provide relief for those who do.” Additional Factual Findings 28.

While Colorado did not undertake a detailed study of ways to improve the efficiency of the Vermejo system in New Mexico, thinking that it was not its place to administer the Vermejo in New Mexico, Tr. 238–239, based on the evidence available, its experts concluded that reasonable conservation measures would offset the diversion, *e. g., id.*, at 243, 247, 876, 2579. This expert opinion testimony was plainly admissible on this ultimate question, Fed. Rules Evid. 702, 704, and together with other evidence in the record, fully supports the Master’s conclusion on this question.

River will supplement the existing insufficient water supply available to Colorado users. There seems to be little doubt that the Purgatoire River system is over-appropriated, demand exceeding available supply. Any additional water would help to relieve shortages. CF&I and the city of Trinidad are but two examples of users that would benefit by having water available to meet their demands. (Tr. 535-538, 623-630, 795-796). There is some thought that the benefit of alleviating these shortages is sufficient to justify Colorado diversion of Vermejo water; however, Colorado's proposal does not stop with alleviating shortages but goes on with major plans for the water and thereby additional benefits." *Id.*, at 23-24.

With respect to the interim period pending full development of permanent uses, the Master found:

"Colorado proposes to temporarily use the diverted Vermejo River water for irrigation of 2,000 acres of agricultural land owned by CF&I. Plans to use and reuse the water as it flows down the valley result in a high efficiency expectation. (Tr. 744-746)." *Id.*, at 22.

The Master credited evidence adduced by Colorado estimating that for its proposed agricultural uses of the diverted water "the efficiency will be 60-75%."⁶

The Master again emphasized that reasonable conservation measures "would reduce New Mexico's 'loss' to insignificance." *Id.*, at 27. He also noted that the District received a significant supply of water from the Chico River, that it has

⁶"There is no reason to doubt the validity of Colorado's proposals or intentions. Even if the actual does not comport with the ideal, it is not for the Master or for New Mexico to say that reasonable attempts to conserve water will not be implemented by Colorado. The strict administration of water already on display in Colorado increases the likelihood that the proposed measures will be implemented at least to a reasonable degree." Additional Factual Findings 21.

four large reservoirs that give it "great ability to store water and enhance the supply," *id.*, at 12⁷ and, as the Court recognizes, *ante*, at 318, the District has historically used less water than was available to it.⁸ Finally, the Master summarized his conclusions concerning the District by stating that "shortages resulting from [the] Colorado diversion (if they exist at all) would be experienced in a project that has failed from the beginning to develop its allotted acreage, has failed to meet its financial obligations, and quite possibly should never have been built." Additional Factual Findings 8.

IV

The Special Master's task was not to draw up blueprints for New Mexico to eliminate its waste. The Master, based on all the evidence, concluded that reasonable conservation efforts in New Mexico would offset the effects of the Colorado diversion. Cf. *Wyoming v. Colorado*, 259 U. S., at 486 ("Our belief gathered from all the evidence is that, with the attention which rightly should be bestowed on a problem of such moment, it can be successfully solved within the limits of what is financially and physically practicable"). My examination of the testimony persuades me that that conclusion is supported by the record.

Accordingly, I respectfully dissent.

⁷ See also *id.*, at 27 ("As noted earlier, the District has a reservoir system allowing carryover from wet years to supply water during periods of shortage. Therefore, the user most affected *does* have a means of offsetting the possible shortage").

⁸ The District has irrigated an average of 4,379 acres although it has rights from the Bureau of Reclamation to irrigate 7,979 acres. *Id.*, at 8. Moreover, the Master found that two individual farmers with water rights senior to the District, but whose farms are located downstream from the District, have historically used less than their decreed rights even though the supply was adequate to enable them to develop their entire acreage. See *id.*, at 6-7.