

In the United States Court of Federal Claims

No. 98-101 L

Filed: December 31, 2003

TULARE LAKE BASIN WATER STORAGE DISTRICT, et al.,)	<u>Fifth Amendment Taking</u> —Damages:
Plaintiffs,)	Plaintiffs are entitled to just compensation,
v.)	plus the rate of interest provided for by 40
THE UNITED STATES,)	U.S.C. § 258e-1 (2000), for water losses
Defendant.)	arising from federal biological opinions
)	issued pursuant to the Endangered
)	Species Act that limited plaintiffs’
)	contractually conferred rights to water.
)	
)	
)	

Roger J. Marzulla and Nancie G. Marzulla, Marzulla & Marzulla, Washington, D.C., counsel for plaintiffs. William C. Kuhs, Michael N. Nordstrom, and Ernest A. Conant, of counsel.

Fred R. Disheroon, with whom were Joanna B. Goger, Alf W. Brandt, and Assistant Attorney General Thomas L. Sansonetti, U.S. Department of Justice, Environment and Natural Resources Division, Special Litigation Section, Washington, D.C., counsel for defendant. Dawn Andrews McIntosh and Christopher Keifer, of counsel.

OPINION

WIESE, Judge.

This opinion follows a trial held from July 15–26, 2002, to determine the value of water rights taken by the federal government in its application of the Endangered Species Act to the California state water system. Plaintiffs are California water users who, pursuant to an April 30, 2001, liability determination by this court, are owed Fifth Amendment compensation for the loss of their contractually conferred water as a result of restrictions imposed by the government to protect the delta smelt and winter-run chinook salmon.

The focus at trial was threefold: to determine the quantity of water taken from plaintiffs, to establish the fair market value of that water, and to identify the appropriate rate

of interest to be applied to any recovery. Having carefully considered the evidence presented at trial as well as the parties' post-trial submissions, we conclude that plaintiffs are entitled to damages in the amount of \$13,915,364.78, plus interest at the rate specified in 40 U.S.C. § 258e-1 (2000).

FACTS

A complete recitation of the facts can be found in Tulare Lake Basin Water Storage Dist. v. United States, 49 Fed. Cl. 313, 314–16 (2001). In simplest terms, this case involves the attempts by various state and federal agencies to protect the winter-run chinook salmon and delta smelt—two species of fish determined by the National Marine Fisheries Service and the United States Fish and Wildlife Service to be in jeopardy of extinction.

At the center of the litigation are the Central Valley Project (“CVP”) and the State Water Project (“SWP”)—facilities operated by the federal government and the state of California, respectively, that transport water from northern California, via a system of natural and man-made structures, to water users in the southern portion of the state. The two water projects draw their water from pumping plants located at the southern end of the Sacramento-San Joaquin Delta (“the Delta”), an area supplied by water flows from the Feather and Sacramento Rivers. Water that is not diverted from the Delta flows into the San Francisco Bay.

Integral to this water delivery system is the Delta Cross Channel, a facility built by the federal government in the 1950s to improve water quality in the south Delta. When open, the Delta Cross Channel gates divert fresh water from the Sacramento River into the south Delta and toward the CVP and SWP pumping plants. When the gates are closed, the water remains in its natural course in the Sacramento River, eventually flowing out to sea.

Water from the water projects is distributed on the basis of contracts entered into by various water contractors (including the present plaintiffs¹) and either the California Department of Water Resources (“DWR”) (the state agency that operates the State Water

¹ Of the present plaintiffs, two—Tulare Lake Basin Water Storage District (“Tulare”) and Kern County Water Agency (“Kern County”)—have contracts directly with the Department of Water Resources, and three—Hansen Ranches, Lost Hills Water District, and Wheeler Ridge-Maricopa Water Storage District—have subsidiary contracts with Tulare and Kern County.

Project) or the Bureau of Reclamation (“BOR”) (the federal agency that operates both the Central Valley Project and the Delta Cross Channel gates). Pursuant to these contracts, the water contractors are responsible for all costs associated with the water projects, independent of the amount of water actually delivered. In exchange, the water contractors are entitled to a percentage of the water deemed by DWR or BOR to be available in a particular year.

Pursuant to their contracts with DWR, plaintiffs are eligible for two categories of water relevant to this action: an annual entitlement, called Table A water, and so-called Article 21 water (also referred to as unscheduled or interruptible water), each named for its location in the contract. Under the first category, plaintiffs are entitled to a percentage of the water identified by DWR as being available in a particular year, an amount usually based on the water contractors’ requests, or fraction thereof, up to their contractually determined entitlement amount (1,153,400 acre-feet per year for Kern County and 118,500 acre-feet per year for Tulare). Under the second category, plaintiffs can make an additional request for water that is essentially identified as surplus, *i.e.*, water in excess of the amount required to meet the needs of the water project (including its Table A allocations). It is these two categories of water for which plaintiffs now seek compensation.

The events that give rise to plaintiffs’ taking claims belong to three time periods: 1992, 1993, and 1994. In the late 1980s, an increase in the level of fish kill at the SWP and CVP pumping plants raised concerns about the effects of these water projects on the winter-run chinook salmon. In response to these concerns, the National Marine Fisheries Service (“NMFS”) initiated a consultation in early 1991 with BOR and DWR pursuant to the Endangered Species Act (“ESA”), 16 U.S.C. §§ 1531–1544 (2000), to determine the impact of the CVP and the SWP on this species.

While the NMFS consultation was ongoing, BOR, upon the recommendation of NMFS, closed the Delta Cross Channel gates on February 3, 1992, in an effort to protect the out-migration of juvenile winter-run chinook salmon. Following the closure of the cross channel gates, NMFS concluded its consultation by issuing a biological opinion on February 14, 1992. As part of its opinion, NMFS recommended that the Delta Cross Channel gates remain in the closed position. The opinion contained no specific measures, however, relating to the operation of the SWP or CVP pumping plants.

On March 19, 1992, the California State Water Resources Control Board, the

agency responsible for establishing state water quality standards,² addressed NMFS's February 14 biological opinion. Recognizing that DWR could not comply with the opinion and still meet the salinity requirements (*i.e.*, water quality standards) imposed on it by its operating permits from the State Water Resources Control Board,³ the Board concluded that the federal requirements under the ESA overrode the terms set forth in the permits. In a March 19, 1992, order (Order 92-02), the Board thus relaxed the salinity standards to which the SWP was otherwise subject.

Although NMFS did not identify the Delta as a source of take⁴ in its February 14, 1992, biological opinion, DWR and BOR observed a dramatic increase in salmon kills at their respective pumping stations in early April 1992. In response, DWR reduced pumping on April 3, 1992, and BOR followed suit on April 6, 1992. Seeking to address the problem more formally, however, the agencies met with NMFS on April 8, 1992, pursuant to the consultation reinitiation requirements of the ESA.

On the basis of this April 8, 1992, meeting, NMFS concluded that the incidental take of the winter-run chinook salmon appeared to be greater than anticipated in its biological opinion, and that "immediate action" would thus be "necessary to reduce the potential for additional taking during the remainder of the outmigration period." Toward this end, NMFS set an agreed-upon, reduced level of pumping for the period April 11–30, 1992. In addition, NMFS agreed to amend the February 14, 1992, biological opinion

² Water Right Decision D-1485 ("D-1485"), adopted in 1978 by the State Water Resources Control Board after eleven months of evidentiary hearings, set forth state water quality standards for salinity control and for protection of fish and wildlife in the Delta by setting minimum outflows, limiting water exports by the CVP and SWP, and establishing maximum allowable salinity levels, at various places and times, throughout the Delta. D-1485's water quality standards, in other words, governed the operation of the SWP in the absence of ESA restrictions.

³ When the Delta Cross Channel gates are closed, fresh water from the Sacramento River is no longer diverted into the Delta, leading to an increase in both the salinity levels of the water and the pollution from agricultural drainage. This increase in turn leads to a deterioration of the water quality at the CVP and SWP pumping plants, a situation that could, over time, prevent the water projects from complying with state water quality standards that establish maximum salinity levels.

⁴ The ESA defines "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." 16 U.S.C. § 1532(19). No connection exists, however, between "take" under the ESA and a taking under the Fifth Amendment.

explicitly to provide incidental take coverage for the winter-run chinook salmon, allowing for incidental take throughout the remainder of April at both the state and federal water projects.⁵ The biological opinion was thus amended by letters dated April 27, 1992 and January 14, 1993.

The water projects continued to operate in compliance with the amended biological opinion for the remainder of 1992. In early 1993, recognizing that the incidental take provisions of the February 14, 1992, opinion would not carry forward into the new year, NMFS agreed to extend the existing biological opinion for the interim period prior to the issuance of the 1993 biological opinion. In this subsequent opinion, issued on February 12, 1993, NMFS again found that the proposed operation of the Delta export facilities was likely to have an adverse effect on the winter-run chinook salmon. Accordingly, NMFS imposed new constraints on export pumping in the late fall and winter of 1993 and early spring of 1994.

On May 26, 1993, the United States Fish and Wildlife Service (“USFWS”) issued a third biological opinion covering the period May 26, 1993, to February 15, 1994, this one addressing the delta smelt. In this opinion, USFWS directed that pumping be decreased at the SWP pumping plant “during intervals when large numbers of larval and juvenile delta smelt appear at the Federal and State fish screens.” USFWS additionally instructed that the combined pumping of the CVP and SWP pumping plants “shall be limited to a 14-day combined average rate of 4,000 [cubic feet per second] during May 1993, and 5,000 [cubic feet per second] during June 1993.” USFWS issued a similar opinion, also designed to protect the delta smelt, on February 4, 1994.

As a result of pumping curtailments associated with these federal directives, and pursuant to our earlier liability determination, plaintiffs now seek compensation for the resulting water loss in the amount of \$65,697,866 (representing an award of \$13,776,817 to Tulare and \$51,921,049 to Kern County). Plaintiffs additionally seek interest on this amount from the date of taking until the award of judgment.

DISCUSSION

⁵ Under the ESA, entities that have consulted with the designated federal agencies and that have complied with the resulting operating procedures suggested by these agencies (called reasonable and prudent alternatives or RPAs) may be authorized to have a certain level of take at their facilities. Compliance with the RPAs can thus exempt the facility from the possibility of criminal sanctions under Section 9 of the ESA in spite of on-going fish loss. 16 U.S.C. §§ 1536(b)(4), (o)(2).

In order to calculate the compensation due to plaintiffs for the taking of their property, we must first determine the amount of water not available to plaintiffs as a result of ESA restrictions, a concept the experts refer to as “water impact.” Plaintiffs calculated this number as 326,089 acre-feet of water; defendant set it at zero (under the theory that none of the water would have been both identifiable with ESA restrictions and actually allocated to the water contractors). Once we have determined the amount of water lost, we must then assess the appropriate method to value that loss. Here, too, the parties disagreed. In plaintiffs’ view, the correct measure for the cost of the water was reflected in comparable sales data, leading to a figure of \$72 per acre-foot for 1992 and 1993, and \$70 per acre-foot for 1994 (plus the cost of transporting the water to plaintiffs’ service areas).⁶ Defendant relied instead on the costs associated with pumping groundwater, producing a value for Tulare of \$41 per acre-foot in 1992 and 1994 and \$3 per acre-foot in 1993, and for Kern County of \$38 per acre-foot in 1992 and \$37 per acre-foot in 1994.⁷ Finally, we must determine the appropriate rate of interest to be applied to plaintiffs’ award, a number plaintiffs identified with the operating loan rate then prevailing in the Kern County/Tulare service area, and defendant identified with the 52-week Treasury bill (“T-Bill”) rate set forth in 40 U.S.C. § 258e-1. We address these issues in turn.

I. The Amount of Water Lost Under ESA Restrictions

The first step in calculating plaintiffs’ recovery is determining the quantity of water taken from each of the plaintiffs. That determination in turn depends on three factors: the overall amount of pumping foregone, the portion of that loss properly attributable to ESA restrictions, and the method by which that quantity would otherwise have been distributed. As a general matter, the first inquiry—the amount of water lost—was not subject to dispute. The parties disagreed instead as to the entity responsible for the water loss and the manner in which these stipulated volumes would have been allocated.

In support of its proposed allocationscheme, plaintiffs offered the testimony of two DWR officials: Mr. James R. Snow, chief of DWR’s Project Operations Studies Section, and Mr. Donald R. Long, chief of DWR’s State Water Project Analysis Office (the office that prepared allocations and administered the water supply contracts at issue here).

⁶ Including transportation costs, plaintiffs calculated the pre-interest compensation owed to Tulare as \$85.55 per acre-foot in 1992, \$82.34 per acre-foot in 1993, and \$83.84 per acre-foot in 1994; and to Kern County as \$89.45 per acre-foot in 1992, \$83.18 per acre-foot in 1993, and \$87.65 per acre-foot in 1994.

⁷ Kern County made no claim for lost water in 1993.

Together, these individuals were primarily responsible for all of DWR's allocation decisions during the 1992–1994 time-frame.⁸

In preparing his expert report, Mr. Snow was asked to determine the amount of pumping foregone, *i.e.*, the quantity of water that would have been available had the SWP merely been operating under state water quality standards in the absence of other restrictions. Mr. Snow next adjusted the pumping foregone numbers to reflect the actual water impact—a concept that accounts for the fact that not all of the water that might otherwise have been available could have been used by the water contractors or placed into storage, and would therefore have flowed out to sea.

Employing this approach, Mr. Snow calculated the water impact for 1992 as 137,986 acre-feet, representing approximately 23,000 acre-feet lost in February 1992 and another 115,000 acre-feet lost in April of that year. For 1993, Mr. Snow testified that while the pumping foregone totaled 707,989 acre-feet for the period January through April, the actual water impact would have been on the order of only 44,000 acre-feet (a discrepancy explained by the fact that the water, in Mr. Snow's view, would have been used to fill the reservoir rather than allocated to the contractors). Finally, Mr. Snow calculated a pumping foregone number of 885,000 acre-feet for 1994, with a water supply impact of 209,000 acre-feet. Of this amount, Mr. Snow identified 144,000 acre-feet as destined for storage for later distribution and 65,000 acre-feet to be distributed immediately as Article 21 water.

Relying on the numbers generated by Mr. Snow, Mr. Long in turn determined allocation amounts based on an assessment of whether the particular water contractors had had their water needs fully met in each of the years at issue. He thus estimated the 1992 loss to Kern County as 100,504 acre-feet and to Tulare as 10,326 acre-feet; the 1993 loss to Tulare as 34,400 acre-feet; and the 1994 loss to Kern County as 153,782 acre-feet and to Tulare as 27,077 acre-feet. In total, Mr. Long concluded, Kern County would have received an additional 254,286 acre-feet of water and Tulare would have received

⁸ Although the ultimate approval for allocation decisions belonged to Mr. David N. Kennedy, director of DWR, Mr. Snow was responsible for the preparation of operations studies that were used as the basis for determining annual delivery allocations, and Mr. Long was the lead individual in making allocation decisions to be submitted for Mr. Kennedy's approval. According to Mr. Long's testimony, neither Mr. Kennedy nor any other director had ever rejected a water allocation that had been recommended by Mr. Long's office.

an additional 71,803 acre-feet.⁹

While defendant did not take issue with the numbers generated by Mr. Snow, it raised essentially three objections to plaintiffs' allocation scheme. Defendant argued first that a significant portion of the water loss Mr. Snow identified was the result of conservation actions either mandated by state requirements or undertaken voluntarily by the state and, as such, could not properly be characterized as a federal taking. Second, defendant maintained that no compensation was owed for losses of Article 21 water in 1993 and 1994 because, in its view, plaintiffs had no entitlement to interruptible water. Finally, defendant argued that the retroactive allocation of resources performed by Mr. Long was inconsistent both with the allocation methods employed by DWR at the time and with DWR's operating philosophy more generally.

A.

Defendant's first argument—that much of the water loss was properly attributable to the state rather than the federal government—appears on its face to revisit the court's April 30, 2001, liability determination. Although the court alluded in that decision to the issuance of various biological opinions as the events effecting the taking, we did not definitively rule that the biological opinions' official release dates marked the precise moment of taking. As a consequence, plaintiffs drew our attention at trial to BOR's February 3, 1992, closing of the Delta Cross Channel gates, an action they argued was compelled by the ESA and resulted in a compensable water loss to plaintiffs.

Defendant did not dispute that the cross channel gates were closed on that date to protect the winter-run chinook salmon. It argued, however, that the closure was not dictated by the ESA, but resulted instead from a voluntary action by BOR and DWR prior to the issuance of NMFS's biological opinion.¹⁰ Because the gate closure in turn led to a deterioration of the water quality in the Delta, defendant maintained that the pumping reductions that occurred from February 11–14, 1992, were necessitated solely by state water quality standards and not by federal mandate. The February pumping curtailment,

⁹ Plaintiffs did not make a claim for the entirety of the 137,986 acre-feet calculated by Mr. Snow for 1992, presumably on the ground that Mr. Long's report identified a portion of this amount—some 27,156 acre-feet—with water contractors who are not among the present plaintiffs. Accordingly, these losses are not considered within this action.

¹⁰ Although BOR is in fact a federal entity, plaintiffs made no claim that its closing of the cross channel gates independently constituted a taking. Accordingly, we do not take up that argument.

in other words, did not constitute a Fifth Amendment taking.¹¹

The same was true, in defendant's view, for any water losses occurring before April 27, 1992, the date on which the February 14, 1992, biological opinion was amended to include restrictions on pumping in the Delta. Prior to this date, defendant maintained, the biological opinion did not contain any measures requiring DWR to reduce pumping to protect the winter-run chinook salmon. Indeed, defendant made the case that the April pumping restrictions were not in fact required by the federal government at all, but were instead specifically requested by DWR. This fact, defendant argued, meant that the federal government could not be held liable for any resulting water loss.

In support of its position that the federal government was not responsible for the 1992 cutbacks in pumping, defendant cited a series of cases for the proposition that the mere existence of a statute prohibiting certain conduct does not amount to a taking. See, e.g., United States v. Riverside Bayview Homes, Inc., 474 U.S. 121, 126 (1985) (the "mere assertion of regulatory jurisdiction by a governmental body does not constitute a regulatory taking"); Boise Cascade Corp. v. United States, 296 F.3d 1339, 1350 (Fed. Cir. 2002) (the "imposition of [a permitting] requirement, without more, simply cannot give rise to a compensable taking"). The ESA, in other words, did not itself confer liability on the federal government; only through the direct application to plaintiffs of ESA restrictions mandating certain conduct could such liability be said to arise. The question of liability, in defendant's view, thus turned on whether any of the incidents identified by plaintiffs—the closure of the cross channel gates, the issuance of the February 14, 1992, biological opinion, or the release of the April 27, 1992, amendment—in fact resulted in water loss attributable to the ESA.

Plaintiffs, for their part, argued that BOR's closure of the cross channel gates on the recommendation of NMFS was compelled by the ESA, in implementation of the February 14, 1992, biological opinion, thereby rendering the government liable for any resulting water loss. In support of this thesis, plaintiffs pointed to defendant's stipulation that the cross channel gates were closed on February 3, 1992, "to protect the outmigration of juvenile winter-run chinook salmon," that the closure in turn led to a build-up in salinity levels that "triggered [state] water quality constraints," and that DWR, as a result, was

¹¹ Defendant additionally challenged the notion that the gate closure was the proximate cause of the pumping reductions, arguing that the cross channel gates are geographically and hydrologically remote from the pumping plants and that too many other factors go into the water quality equation to construe a gate closure as a de facto reduction in pumping. We were given insufficient evidence at trial, however, to make a finding on this point.

unable to “increase pumping on February 11, 1992 as it could have done absent these constraints.” Plaintiffs additionally maintained that the February 14, 1992, biological opinion required closure of the gates on February 1, 1992, and that NMFS specifically recognized that such closure would result in water loss.

In contemplating the interplay between the state and federal government in the events that led to the 1992 pumping reductions, we begin with the testimony of Mr. James H. Lecky, division chief at NMFS during the relevant time period. According to Mr. Lecky, DWR had two options in light of the take occurring at its facilities: consultation with the federal agencies under Section 7 of the ESA (the path it in fact pursued) or the incidental take process available to non-federal agencies under Section 10 of the ESA. While DWR was not compelled to consult with NMFS under the ESA, Mr. Lecky testified that it elected to do so because of the coordinated operating agreement between BOR and DWR.

Mr. David N. Kennedy, director of DWR, in turn testified that NMFS was the lead agency in the efforts to protect the winter-run chinook salmon and that he understood NMFS’s biological opinion to be a “de facto modification of [DWR’s] operating permit.” Mr. Kennedy additionally testified that DWR treated “the criteria that were set forth in the biological opinion . . . as operating criteria.”

In explaining DWR’s compliance with such “operating criteria” prior to the date they were officially imposed, Mr. Snow, plaintiffs’ expert and a 26-year veteran of DWR, testified that while the period from February 3–14 was “not covered specifically” by the biological opinion, the cross channel gate closure was nonetheless an “ESA-driven action.” This was the case, in the view of Mr. Larry B. Gage, chief of DWR’s Operations Control Office, because DWR believed that “complying with the requirements that were going to be in effect any day would be the right thing to do.” Mr. Gage additionally testified that adherence to the standards of the biological opinion prior to the opinion’s official issuance on February 14, 1992, “would show that we were as a water project trying to cooperate and do what we could to assure the continuity of this listed species” and would, in addition, “keep [Mr. Gage] out of jail.”

Mr. Robert Potter, chief deputy of DWR and self-described point person on the ESA issues related to the Delta and Delta water operations, echoed Mr. Gage’s concern about criminal sanctions. Mr. Potter confirmed that although DWR’s actions were taken in anticipation of the biological opinion rather than in response to it, DWR was nonetheless motivated in large part by its fear that non-compliance would result in criminal penalties for

its employees under Section 9 of the ESA.¹² Indeed, Mr. Gary R. Stern, an employee of NMFS and author of the February 1992 biological opinion, acknowledged that an enforcement action had in fact been initiated against the Glenn-Colusa Irrigation District during this same time period when the district refused to comply with reasonable and prudent alternatives proposed by NMFS.

In light of the testimony of these DWR and NMFS officials, we have no doubt that BOR and DWR, in closing the Delta Cross Channel gates, were complying with both the spirit and the letter of the federal directive as it would ultimately be issued. Despite acknowledging this fact, however, we are unable to conclude that measures implemented prior to the issuance of the February 14, 1992, biological opinion represented federal action sufficient to confer liability on the government for a taking.

Prior to the issuance of the biological opinion, DWR's role in the consultation was a voluntary one. Although as a practical matter the ecological handwriting may have been on the wall at the time of the gate closure, that action was not compelled by federal mandate. And while DWR is perhaps to be commended for its spirit of cooperation with the federal agencies, its efforts cannot be charged to the federal government prior to the time the government explicitly directed it to act.

Nor do we attach particular significance to the fact that NMFS recommended that the cross channel gates be closed on February 3, 1992. BOR and DWR were not legally bound to comply with NMFS's suggestion and presumably would not have done so had

¹² The ESA provides in part:

Penalties and enforcement

(b) Criminal violations

(1) Any person who knowingly violates any provision of this [Act] . . . shall, upon conviction, be fined not more than \$50,000 or imprisoned for not more than one year, or both. Any person who knowingly violates any provision of any other regulation issued under this [Act] shall, upon conviction, be fined not more than \$25,000 or imprisoned for not more than six months, or both.

16 U.S.C. § 1540.

it not fit their own project objectives.¹³ At a February 3, 1992, meeting between DWR and NMFS, for instance, DWR's chief deputy, Mr. Potter, took the position that DWR would not comply with the reasonable and prudent alternatives then under consideration by NMFS¹⁴—measures significantly more controlling than NMFS's mere “recommendation.”

Plaintiffs' assertion that the reasonable and prudent alternatives contained in the February 14, 1992, biological opinion served as a retroactive mandate by the federal government that the Delta Cross Channel gates be closed on February 1, 1992, is similarly unavailing. In its opinion, NMFS suggested that the Delta Cross Channel gates be maintained in a closed position from February 1 until May 1, 1992, to reduce the diversion of the salmon. We read this language, however, as doing no more than recognizing the existing operating status of the SWP and not as imposing any retroactive obligation on either BOR or DWR.

In the absence, then, of federal action giving rise to liability, the pumping reductions that occurred from February 11–14, 1992, can be identified only with limitations imposed by state water quality standards. As such, the 23,351 acre-feet of water lost in February 1992 cannot be seen as the subject of a Fifth Amendment taking.

Having accepted defendant's characterization of the February 1992 pumping curtailments as non-compensable, however, we can go no further with its argument. In defendant's view, not even the February 14, 1992, issuance of the biological opinion was sufficient to confer liability on the federal government because the opinion placed no constraints on DWR's operations. This interpretation, we believe, is contradicted both by the text of the opinion and by the testimony presented at trial.

¹³ Despite the concerns expressed by Mr. Gage and Mr. Potter, plaintiffs offered no evidence that criminal sanctions had ever been considered, much less initiated, against DWR or its employees, and the likelihood of such an enforcement action—particularly in light of DWR's on-going participation in the consultation process—seems, at best, remote.

¹⁴ In draft form, NMFS's reasonable and prudent alternatives called for the closing of the Suisun Marsh Salinity Control Gates in an effort to divert water and fish out of the Sacramento River. Mr. Potter objected to this approach at the February 3 meeting, however, fearing that the closure would greatly compromise water quality in the marsh. In order to address this concern, NMFS developed a program calling for the closing of a number of small, unscreened water diversions to allow the Suisun Marsh Salinity Control Gates to remain open, thereby protecting the fish that made it into the Suisun Marsh rather than attempting to exclude them from the marsh altogether.

In a cover letter issued with the February 14, 1992, biological opinion, NMFS noted that it believed certain actions were “necessary to protect winter-run chinook salmon in 1992 given the critical condition of the species and the last several years of drought experienced by California.” Included in these actions was the “closing [of] the Delta Cross Channel gates for an extended period to reduce diversion of juveniles into the delta.”

In the attached biological opinion, NMFS observed that the “data strongly suggests that the closure of the Cross Channel gates during normal and low flow years such as 1992 can yield a major increase [in] the survival of winter-run chinook salmon in the Delta.” The opinion went on to conclude that the migration plan then being followed by BOR and DWR was “inadequate” and that the “proposed operation of the Cross Channel gates from February through May in 1992 will adversely impact the survival of the 1991 winter-run chinook salmon year-class during the peak Delta outmigration period.”

As part of its reasonable and prudent alternatives, NMFS suggested that the agencies “[m]aintain the Delta Cross Channel Gates in the closed position from February 1 through May 1 to reduce the diversion of juvenile winter-run outmigrants into the Delta.” Elaborating on this point, NMFS observed that “[a]s of February 3, the gates of the Delta Cross Channel have been closed to mitigate the impacts of [BOR] and State Delta operations on winter-run chinook salmon.” NMFS recognized, however, that both DWR and BOR would “be required to reduce Delta water export operations” in order to “maintain Delta water quality standards with the Cross Channel gates closed.” NMFS additionally noted that BOR had estimated that the gate closure would “result in pumping reductions of about 1,000 cfs per day and an export loss of 149,000 [acre-feet] from February 1 through May 1 (CVP and State Water Project combined).”

In defendant’s view, the language of the reasonable and prudent alternatives merely recognized that water quality-related pumping reductions might result from the closing of the cross channel gates but did not itself direct that pumping be reduced or identify the decrease in pumping with a benefit to the salmon. Indeed, Mr. Stern, the author of the biological opinion, acknowledged that insofar as DWR was concerned, there were no specific requirements in the February 14, 1992, opinion directing it to act. This was the case, Mr. Stern testified, because the constraints that might otherwise have been deemed necessary were essentially in place: “the water projects proposal included a minimal amount of delta pumping and [NMFS] anticipated a minimal amount of incidental take would result and did not see the need for additional measures based on that project description.”

There is, of course, no question that the language of the February 14 biological opinion is less explicit than the limitations set forth in the April 27, 1992, amendment, which specified that DWR and BOR must “restrict operation of the Banks Pumping Plant and

Tracy Pumping Plant to a maximum combined water export rate of 1,200 [cubic feet per second] 1 minute after midnight on April 11 through April 30, 1992.” Yet, although the biological opinion did not restrict pumping as emphatically as did the April 27 amendment, the opinion nevertheless endorsed a number of operating conditions—including the continued closure of the cross channel gates and the concomitant reduction in SWP pumping—that were integral to NMFS’s overall findings. In light of this determination, BOR and DWR could hardly have reversed course with regard either to the gate closure or to their respective pumping curtailments.

This fact, we believe, confers liability for the April 1992 pumping reductions squarely on defendant. While we are unable to charge the federal government with actions the state has taken of its own accord, we are equally unwilling to allow it to avoid responsibility for measures that, though initially implemented by the state, are nonetheless subsequently incorporated into the federal government’s ecological and hydrological regime. In relying on the status quo to achieve its objectives, in other words, NMFS essentially ratified these procedures and, in doing so, incurred liability for them. The issuance of the February 14, 1992, biological opinion, bolstered by the more explicit April 27, 1992, amendment, put the state on notice that its actions were directly subject to restrictions under the ESA. We thus conclude that water losses from April 3–27, 1992, are properly identifiable with federal action and are therefore compensable under the Fifth Amendment.

B.

Defendant’s second challenge to plaintiffs’ allocation model was directed at plaintiffs’ claim for unscheduled water in 1993 and 1994. Experts for both parties agreed that DWR would have made Article 21 water available as of February 1993 and that Tulare would have received 34,400 acre-feet of that water. Defendant further conceded that an additional 54,000 acre-feet of interruptible water would have been available in 1994. Defendant argued, however, that plaintiffs had no legal entitlement to Article 21 water because at least one of the requirements for declaring the availability of such water—that the SWP have excess capacity—was not met.¹⁵

¹⁵ Defendant additionally argued that the availability of Article 21 water was subject to DWR’s independent obligation under both the California state constitution and Water Right Decision D-1485 to protect fish and wildlife. Defendant provided us with no evidence, however, to suggest that state water quality standards would have prevented the distribution of Article 21 water in 1993 and 1994, or to refute Mr. Long’s conclusion that
(continued...)

Pursuant to the water contracts with DWR, Article 21 water was to be made available when, after “appropriate allowance for holdover storage,” the supply of project water exceeded the “total of annual entitlements of all contractors for that year.” In practice, DWR generally declared Article 21 water available when the San Luis Reservoir was full or virtually full, when contractor’s Table A allocations were otherwise being met, and when sufficient water existed to meet state water quality standards. In 1993, each of these conditions was satisfied: the reservoir was full, excess water was still available to be pumped in the Delta, and DWR was meeting the normal requests of its contractors (the contractors ultimately received 100 percent of their annual entitlement requests in 1993). Similarly, in 1994, although DWR would ultimately deliver only 50 percent of the Table A entitlements for the year, defendant conceded that excess water in the early part of the year would have caused DWR to declare Article 21 water available from January until March 30.

Given these facts, we are bound to conclude that even if plaintiffs’ right to Article 21 water was a conditional one, this condition had nevertheless been met. Mr. Long testified that but for the ESA curtailments on pumping, Article 21 water would have been delivered. In light of this testimony, offered by the individual essentially responsible for making such a determination, we have no doubt that interruptible water would indeed have been available during the years at issue.

C.

Our conclusions that the water impact for April 1992 resulted from ESA restrictions and that plaintiffs possessed an entitlement to interruptible water in 1993 and 1994 does not, in defendant’s view, end our inquiry. Plaintiffs cannot recover for the full extent of these losses, defendant argued, because much of this water would never have been allocated to plaintiffs in the first instance.

In support of this position, defendant offered the testimony of Mr. Curtis E. Spencer, a former DWR employee with a year-and-a-half’s worth of experience managing DWR’s long-term water supply contracts. In his report, Mr. Spencer essentially adopted the calculations for pumping foregone provided by Mr. Snow but offered a number of challenges to Mr. Long’s allocation scheme. Mr. Spencer concluded, for instance, that DWR would not have allocated the 137,000 acre-feet Mr. Long contended it would have

¹⁵(...continued)

DWR would in fact have declared such water available.

distributed in 1992, but would instead have retained that amount in storage for use the following year. Similarly, Mr. Spencer asserted that of the approximately 193,000 acre-feet available for pumping in 1994,¹⁶ 139,309 of this amount would have been stored to support existing allocations, with 53,691 to be distributed as Article 21 water.

Mr. Spencer offered a myriad of rationales for his conclusions. Because 1992 was the sixth consecutive year of drought and was classified as a critically dry year, Mr. Spencer argued that DWR's main operational goal would have been to fill the San Luis Reservoir—the facility used to store water in the winter months for delivery to the water contractors in the summer. Although DWR ordinarily sought to have the reservoir filled by April of each year, its water supply was already short 50,000 acre-feet of water as of the April 1, 1992, water forecast. This fact, Mr. Spencer contended, would have caused DWR to make up for the shortfall by storing the 137,000 acre-feet of water distributed in Mr. Long's model, thus providing an 87,000 acre-feet cushion in its water supply.

The need for such a cushion was particularly important, Mr. Spencer continued, in light of uncertainties related to possible changes in state water quality standards then under consideration by the State Water Resources Control Board as set forth in a draft decision issued in December 1992. Although the decision was never implemented (and was in fact withdrawn in April 1993), the possibility of heightened standards would, in Mr. Spencer's view, have dictated the need for a conservative approach to water allocation. Indeed, Mr. Spencer argued that such a cautious approach was evidenced by DWR's decision to hold back three-quarters of the 20,000 acre-feet of groundwater available in September 1992, distributing only 5,000 acre-feet to the contractors and reserving the rest to support existing allocations.

In further support of his contention that the 137,000 acre-feet of water would not have been distributed to plaintiffs, Mr. Spencer pointed out that DWR had already made two allocations in March 1992, increasing the contractors' Table A allocations on March 9 to 35 percent of their requests (in response to several late-February/early-March storms) and to 45 percent on March 20. Mr. Spencer testified, however, that DWR was not yet aware, as of the March 20 allocation, that cutbacks in pumping would occur in April under the ESA. The March 20 allocation, in other words, had already identified and allocated the amount of water forecasted to be available in the water supply for April, without regard

¹⁶ Mr. Spencer explained the discrepancy between his water impact number of 193,000 acre-feet and Mr. Snow's water impact number of 209,000 acre-feet by noting that Mr. Snow's number included a demand for Article 21 water by Tulare that Mr. Spencer had not had available to him and that he had not therefore incorporated into his calculations.

to possible pumping curtailments. Thus, in Mr. Spencer's view, any decrease in water resulting from the ESA restrictions did not affect the allocations made to plaintiffs, but rather came out of the margin of error in the water supply.

Mr. Long's distribution model was additionally flawed, Mr. Spencer argued, because it was inconsistent with the way DWR had historically allocated water. As an initial matter, Mr. Spencer observed that DWR generally allocated water only in increments of five percent of the total Table A requests. Thus, in 1992, when the water contractors had requested a total of 3,600,000 acre-feet of Table A water, Mr. Spencer contended that DWR would not have allocated water in increments of less than 180,000 acre-feet, making the 137,000 distributed in Mr. Long's model insufficient to warrant allocation.

The inconsistencies continued, in Mr. Spencer's view, with Mr. Long's identification of the contractors that would have received the lost water. According to Mr. Spencer, Mr. Long incorrectly excluded from additional allocations contractors that at year's end had not taken their entire entitlement amount, under the theory that those contractors had already had their water needs met for the year. Mr. Long accordingly allocated water lost under the ESA only to those contractors that had accepted the entirety of their approved Table A entitlement and that would presumably have had additional demand.

Mr. Spencer objected to Mr. Long's "unmet need" approach, however, because it relied on information—year-end totals—that would not have been available as of the date of the allocations. This approach was further defective, Mr. Spencer maintained, because it was a method that had not been used to allocate water in the quarter century of the SWP's operations. As to the latter point, Mr. Spencer argued that DWR would have allocated additional water in 1992 in the same way it had allocated water on March 20 and September 8 of that year, *i.e.*, based on the contractors' requests, including the 14 contractors Mr. Long had excluded from consideration.

Mr. Spencer raised similar objections to Mr. Long's allocation model for 1994. While Mr. Long concluded that 144,000 acre-feet would have been distributed in May 1994, Mr. Spencer surmised that no additional Table A allocations would have been made that year. Mr. Spencer did concede, however, that an additional 634,000 acre-feet of Article 21 water would likely have been available from January through March 1994, 45,967 acre-feet of which would have been delivered to Kern County and 14,000 acre-feet to Tulare.

In support of his conclusion that DWR would have made additional Article 21 water available from January until March 1994, Mr. Spencer observed that DWR was

already meeting its Table A entitlements during the first three months of 1994, and that the water project had no place to store extra water because its share of the San Luis Reservoir remained full until March 30, 1994. Under these circumstances, Mr. Spencer argued, DWR would either have had to make the excess water available to the water contractors in the form of Article 21 water or have it lost to sea.

Mr. Spencer testified, however, that the surplus of Article 21 water did not translate into the possibility of increased Table A allocations. In explaining this seemingly contradictory result, Mr. Spencer noted that DWR had, pursuant to a compromise with its water contractors, already allocated some 333,000 acre-feet of water above what was forecasted to be available in its water supply.¹⁷ Thus, even after the contractors had turned back some 175,000 acre-feet, DWR was still short 15,000 acre-feet by May 19, 1994. As a further aspect of the compromise with its water contractors, DWR reallocated 50,000 acre-feet of the turned-back water on May 25, 1994, with the result that DWR was 65,000 acre-feet short of its allocation by May 31, 1994, and the Oroville storage facility was projected to miss its September 30, 1994, target by 15,000 acre-feet. As a consequence of these shortfalls, Mr. Spencer concluded that DWR would not have allocated additional Table A water in 1994.

Mr. Spencer did allow for the possibility, however, that DWR would have delivered the remainder of the turned-back water if the water lost under the ESA had been available to it. Under this alternate scenario, Mr. Spencer envisioned that the remaining amount of the turned-back water—some 125,000 acre-feet—would have been allocated on May 25, 1994, leaving the water supply 50,000 acre-feet short of the allocation amounts. He deemed this prospect “remote,” however, since it would have put DWR back into an overdraft situation even if the pumping curtailment had not occurred. Mr. Spencer thus concluded that the pumping reductions in 1994 had no impact on the contractors’ entitlement amounts because the additional water would only have served to make up for the shortfall occasioned by DWR’s over-allocations.

¹⁷ DWR’s over-allocation was a deliberate one that resulted from a compromise with its water contractors in early 1994. At the end of December 1993, DWR announced its intention to deliver water by allocating to each contractor 50 percent of the highest amount used by that contractor in the previous ten years, an approach that led to a December 9, 1993, allocation of 1,559,000 acre-feet. When the water contractors objected to this allocation method, however, DWR eventually agreed to reallocate the water on February 3, 1994, this time based on Table A entitlements. Because DWR had agreed as part of the compromise not to lower its initially proposed allocation amounts, DWR intentionally allocated 2,033,000 acre-feet in February—some 333,000 acre-feet more than was forecasted to be available.

Despite the comprehensiveness of Mr. Spencer's report, plaintiffs, we conclude, made the more compelling case. In endorsing plaintiffs' allocation model, we believe it significant, as an initial matter, that Mr. Long, a 40-year veteran of DWR, was the individual essentially charged with the responsibility for making allocation decisions for DWR during the period in question. This fact renders his judgment as to how DWR would have allocated the lost water virtually unassailable, and contrasts sharply with the limited experience of Mr. Spencer who acknowledged having no direct experience with the engineering and analytical processes used by DWR to allocate water. That Mr. Snow's original calculations were prepared for use by DWR rather than in anticipation of litigation lends them an additional element of credibility.

More significantly, however, Mr. Snow and Mr. Long's conclusions strike us as DWR's more credible course of action. We cannot accept Mr. Spencer's assertion, for instance, that 137,000 acre-feet would have been held over at the end of 1992 rather than distributed to the water contractors. It is clear from the testimony of numerous witnesses that providing water to the contractors was a paramount goal of the SWP. Mr. Spencer himself acknowledged that it was "the custom of the Department to make water available when they can to contractors." While DWR would no doubt have done so responsibly, *i.e.*, keeping in mind the conservation concerns raised by Mr. Spencer, there is nothing to convince us that the retention of water would have been required or even desirable under the circumstances presented.

Mr. Spencer's assertion that DWR would not have made additional allocations in 1992 depended on several assumptions that seem to us unlikely, if not completely implausible. His conclusion was predicated, for instance, almost exclusively on the fact that the April 1, 1992, water forecast projected that the Oroville storage facility would fall short of its target for September 30, 1992. Mr. Spencer conceded, however, that as early as April 30, 1992, DWR was aware that Oroville was 900,000 acre-feet over target. Indeed, cross-examination revealed that both the San Luis Reservoir and the Oroville Reservoir were above target as of September 30, 1992, with the San Luis Reservoir holding some 286,000 acre-feet more water than the 100,000 acre-feet target that DWR attempted to maintain at year's end. Such facts indicate, at a minimum, that Mr. Spencer's caution in allocations was far from necessary.

In light, then, of the over-abundance of water in 1992 and of DWR's policy of allocating as much water as possible to its contractors (going so far as to allocate a mere 5,000 acre-feet in September 1992), it seems inconceivable that DWR would not have allocated the additional water associated with the ESA pumping restrictions. This is especially the case since Mr. Spencer's proposed carry-over of water from 1992 to 1993 would not, by his own admission, have increased entitlement deliveries in 1993 (contractors received 100 percent of their Table A entitlements in that year) and would have increased the time-frame in which Article 21 water was available by only 12

days—from February 11 to February 23—a period for which Mr. Spencer was uncertain if additional demand for such water actually existed. Such a non-beneficial use of water, particularly one that carried with it next to no operational advantage to DWR, flatly contradicts both the testimony of DWR officials as to how water would have been allocated and the operating policies of DWR more generally.

Nor are we persuaded that DWR would have refrained from allocating the water under the theory that the amount did not constitute five percent of the annual entitlement. Mr. Spencer acknowledged that his five-percent rule was not a written requirement, and Mr. Long testified that, to his knowledge, the practice had never been followed by DWR. Indeed, the evidence confirms that DWR's policy was to deliver all available water to the contractors, and it had historically done so, including in September 1992 and May 1994, even when the amounts did not total five percent of the water contract entitlements.

Mr. Spencer's critique of Mr. Long's "unmet need" method of allocation is similarly unavailing. While such an approach may not have constituted DWR's usual method for allocating water, we need look no further than February 1993 for an allocation by DWR based on the contractors' unmet needs—a distribution unhampered by the absence of year-end water totals. Regardless of the frequency with which DWR relied on this method, however, Mr. Spencer's criticism goes only to the division of any recovery among plaintiffs and not to the magnitude of defendant's liability. Under these circumstances, we see no reason to reject the distributions plaintiffs have provided.

Nor as a final matter can we accept the premise that DWR would have refrained from delivering the additional water identified by Mr. Snow for 1994. While Mr. Spencer relied heavily on the fact that DWR was in essence over-extended in its water allocations, this over-allocation was, as we explained above, a deliberate, policy-motivated action on the part of DWR. Because DWR had intentionally chosen the very position it found itself in, and had in fact allocated an additional 50,000 acre-feet in May 1994 despite the projected deficit, we see no reason to conclude that DWR would have departed from its long-standing practice of making as much water available as possible to its water contractors. This is especially the case since DWR was ultimately able to deliver only 50 percent of Table A requests for 1994.

Given these facts, we believe the most likely course of action would have been the alternate scenario Mr. Spencer himself presented: the delivery in May 1994 by DWR of the 125,000 acre-feet of turned-back water, a quantity more than sufficient to cover

plaintiffs' claim of 120,892 acre-feet of Table A water.¹⁸ Combining that amount with plaintiffs' claim for 1992 and 1993, we are thus left with Table A water losses in the amounts of 114,635 acre-feet for the period April 3–27, 1992¹⁹ and 120,892 acre-feet for 1994, and Article 21 water losses in the amounts of 34,400 acre-feet for 1993 and 59,967 acre-feet for 1994.

II. The Value of Water Taken

Having established the quantity of water taken from plaintiffs, we turn now to the compensation owed them for their loss. In support of their respective fair market value calculations, the parties offered the testimony of two valuation experts: Mr. Robert A. Krieger, a registered civil engineer, appearing for plaintiffs, and Mr. Steven Herzog, a real estate appraiser specializing in natural resource valuations, testifying on behalf of defendant. The two experts agreed, in the broadest terms, on the basic methods for appraising plaintiffs' property right: the income capitalization approach, the reproduction cost approach, and the sales comparison approach. Mr. Krieger and Mr. Herzog additionally shared the view that the income capitalization approach was inapplicable in the present case because a one-time quantity of water (as distinguished from a perpetual water right) produces no income stream. It is there, however, that the similarities in the experts' models ended.

The disagreements between Mr. Krieger and Mr. Herzog fell into essentially three categories: the appropriate application of the various appraisal methods and the weight that should be accorded to each, the date on which the property interest should be valued, and the impact of water delivery costs on the determination of fair market value. Together, these differences accounted for an average divergence in the experts' fair market value

¹⁸ Although plaintiffs did not break their 1994 claim down into separate amounts for Table A water and Article 21 water, Mr. Spencer testified that Kern County had requested 45,967 acre-feet of Article 21 water in 1994 and that Tulare had requested an additional 14,000 acre-feet. Subtracting those amounts from plaintiffs' total 1994 claim of 180,859 acre-feet leads to a figure of 120,892 acre-feet of Table A water.

¹⁹ It is unclear from the record whether, in rejecting plaintiffs' taking claim for February 1992, we should subtract from plaintiffs' recovery the entirety of the 23,351 acre-feet associated with that period, or merely the portion of the non-compensable losses—18,755 acre-feet—that is proportional to plaintiffs' claimed share of the 1992 water loss. (Plaintiffs claimed 110,830 acre-feet of the total projected water loss of 137,986 acre-feet, or 80 percent). This opinion presumes the latter, but is open to revision upon notification by plaintiffs.

calculations of more than \$46 per acre-foot.

Mr. Krieger, for his part, favored the sales comparison approach—an appraisal of plaintiffs' property interest based on a consideration of comparable water sales transactions. Chief among the comparable sales Mr. Krieger contemplated were those conducted by the Drought Water Bank, a program established by the governor of California and administered by DWR to secure excess water from sellers north of the Delta for sale to water users in the south.²⁰ In Mr. Krieger's view, the Drought Water Bank sales represented the best measure for valuing the water taken from plaintiffs because the sales occurred at the same time and place as the taking of plaintiffs' water rights, and represented an expense plaintiffs actually incurred in the partial replacement of their lost water.

Relying, then, on the prices established by the Drought Water Bank, Mr. Krieger derived a value, under the sales comparison approach, of \$68.38 per acre-foot for 1992 and 1993, and \$66.34 per acre-foot for 1994 (the actual price paid for Drought Water Bank purchases in 1992 and 1994). In order to account for the fact that Drought Water Bank sales could not have been delivered in the absence of the SWP, however, Mr. Krieger combined the value he calculated under the sales comparison approach with the

²⁰ In describing the mechanics of the Drought Water Bank, Mr. Krieger testified that DWR entered into contracts with prospective water buyers that set an upper limit on the total price the buyers were willing to pay for water, including amounts set aside for administrative expenses and carriage water losses. Keeping this price limitation in mind, DWR in turn negotiated with prospective sellers to reach a price not in excess of this contractually set amount. In 1992, for instance, water users south of the Delta collectively contracted to pay up to \$90 per acre-foot (representing a value of no more than \$60 per acre-foot for the water, \$25 per acre-foot for carriage and other hydrologic losses, and \$5 per acre-foot for administrative expenses), leading DWR to make an initial offer to prospective sellers of \$40 per acre-foot. After a series of negotiations, DWR ultimately agreed to pay the sellers \$50 per acre-foot, which translated into a price for the buyers, not including transportation costs, of \$68.38 per acre-foot.

DWR repeated this process in 1994, with prospective buyers again placing a limit on the price they were willing to pay for the water— this time of \$50 per acre-foot (exclusive of the cost of administrative expenses and carriage water losses)—and DWR again approaching prospective sellers with an offer to purchase surplus water at \$40 per acre-foot. As in 1992, the sellers eventually agreed to a price of \$50 per acre-foot, leading to a final charge, including carrying and administrative costs, of \$66.34 per acre-foot.

value he reached under the reproduction cost approach,²¹ resulting in a weighted total comprised of 95 percent of the former and five percent of the latter. Using this method, Mr. Krieger thus concluded that the fair market value of the water lost was \$72 per acre-foot in 1992 and 1993, and \$70 per acre-foot in 1994.²²

Like Mr. Krieger, Mr. Herzog also considered the Drought Water Bank sales as an alternative source for the lost water. Mr. Herzog rejected Mr. Krieger's approach, however, on the ground that the Drought Water Bank sales represented the upper range of the market value for water as evidenced by the fact that the amount of groundwater pumped in the Kern County/Tulare service areas during the years 1992–1994 far exceeded Drought Water Bank purchases. Had the Drought Water Bank prices been truly competitive, Mr. Herzog argued, water users would have purchased far more water from the Drought Water Bank rather than relying on pumped groundwater. In 1992, for

²¹ In Mr. Krieger's view, the correct way to reproduce plaintiffs' property interest under the reproduction cost approach was not to value groundwater as did Mr. Herzog, but to calculate the cost of reproducing the mechanism by which the water was provided, *i.e.*, the SWP. This exercise could be accomplished, Mr. Krieger contended, by assessing the value of DWR's long-term water supply contracts. Toward this end, Mr. Krieger compiled what he described as "reproduction cost data" —nine permanent transfers of SWP annual entitlements from 1994 to 2003. In order to determine the value of plaintiffs' property right, Mr. Krieger amortized each of the sales over the 41 years remaining in the SWP contract period to calculate the annual per-acre-foot cost paid by the purchaser. To this number, Mr. Krieger then added SWP incremental costs (to reflect additional transportation charges borne by the purchaser) and Delta water charges (a charge paid by all water contractors to maintain SWP conservation facilities) to account for the fixed costs the purchaser had assumed under the contract. Mr. Krieger divided the total by .65 to reflect the fact that contractors could, on average, only expect to receive 65 percent of their annual entitlement in a given year, then adjusted that number by the Consumer Price Index to account for the fact that the water sales occurred in different years. Using this method, Mr. Krieger derived a weighted average unit reproduction cost for plaintiffs' property right of \$140 per acre-foot in 1992, \$144 per acre-foot in 1993, and \$147 per acre-foot in 1994.

²² Mr. Krieger and Mr. Herzog each made adjustments to the values calculated under their respective appraisal methods, with Mr. Krieger adding, and Mr. Herzog subtracting, the cost of transporting water from the Delta to plaintiffs' service areas, resulting, in Mr. Krieger's case, in a claimed recovery for Tulare of \$85.55 per acre-foot in 1992, \$82.34 per acre-foot in 1993, and \$83.84 per acre-foot in 1994, and a claimed recovery for Kern County of \$89.45 per acre-foot in 1992 and \$87.65 per acre-foot in 1994. We address the correctness of these adjustments below.

instance, Tulare pumped 216,000 acre-feet of groundwater but purchased only 31,550 acre-feet of water from the Drought Water Bank, representing less than 13 percent of its total water consumption. Similarly, Kern County pumped 1,795,200 acre-feet of groundwater in 1992 but purchased only 8,170 acre-feet from the Drought Water Bank during the same period. In 1994, this trend continued, with Tulare buying only 14,905 acre-feet from the Drought Water Bank but pumping 92,000 acre-feet, and Kern County buying 45,128 acre-feet but pumping 1,895,800 acre-feet.

In Mr. Herzog's view, these figures confirmed that groundwater pumping, rather than Drought Water Bank sales, represented the market's actual response to reduced surface deliveries in the 1992–1994 time-frame. From that fact, Mr. Herzog concluded that the reproduction cost approach, as measured by the costs of pumping the groundwater, was the best method for appraising plaintiffs' property interest. Based on that method, Mr. Herzog thus calculated the fair market value of plaintiffs' Table A water as \$55 per acre-foot for each of the years in question, reflecting the actual cost of pumping, plus a \$5 profit.²³

In attempting to reconcile the experts' positions with regard to the appropriate method of appraisal, we note that neither expert's report was completely free of difficulties. Plaintiffs presented convincing evidence, for example, that Mr. Herzog's estimate of \$30 per acre-foot for the power cost of extracting groundwater was less than half of the actual power cost in Kern County during the period in question.²⁴ Similarly, Mr. Herzog

²³ In order to determine the compensation owed to plaintiffs, Mr. Herzog subtracted the costs of transporting the water from the Delta to plaintiffs' respective service areas under the theory that Kern County and Tulare would have been responsible for variable costs associated with the SWP water delivery and would have had to pay approximately \$15 per acre-foot in transportation costs to get the water, valued at \$55 in their service areas (as evidenced by on-site groundwater costs), to their pumping plants. In this way, Mr. Herzog calculated a value for the water in the service area of \$41 per acre-foot for Tulare in 1992 and 1994, \$38 per acre-foot for Kern County in 1992, and \$37 per acre-foot for Kern County in 1994.

²⁴ In a report titled "Economic Impacts of the 1992 Drought Year: An Analysis of Economic Costs in Kern County," Northwest Economic Associates, a firm retained by Kern County, indicated that the average depth of groundwater in Kern County was 400 feet, with an associated estimated pumping cost of \$71 per acre-foot. A similar report titled "Economic Impacts of the 1992 California Drought and Regulatory Reductions on the San Joaquin Valley Agriculture Industry," prepared by the same organization for the San Joaquin Valley Agricultural Water Committee, calculated a \$70.19 per acre-foot (continued...)

assumed an average groundwater depth of 200 feet when the record demonstrated instead an average depth on the order of 400 feet. Finally, Mr. Herzog failed to attach any value to the actual water, separate from the pumping, in spite of the fact that the right to the water itself, particularly in an overdrawn basin, could be acquired only through the purchase of overlying land, the purchase of the water right, or the banking of water through a recharge facility. Accounting for these revisions, plaintiffs maintained that the correct calculation for groundwater pumping costs was \$71 per acre-foot in 1992, \$72 in 1993, and \$70 in 1994.

Mr. Herzog's approach was additionally flawed, in plaintiffs' view, because groundwater was unavailable to half of the Kern County service area and did not therefore serve as an adequate replacement for SWP water.²⁵ The appropriateness of groundwater as a substitute was further undermined, plaintiffs argued, by the fact that the Kern County basin from which the groundwater was to be drawn was in overdraft condition (*i.e.*, water was being withdrawn faster than it could be replenished) by some 600,000 acre-feet per year.

Although Mr. Herzog offered various responses to these charges, many of plaintiffs' criticisms strike us as valid. The testimony revealed, for instance, that the actual pumping costs of individual contractors were much higher than Mr. Herzog's numbers indicated.²⁶ And while Mr. Herzog may have been correct that contractors that had access to groundwater would not have been limited in the amount they could have pumped, this fact does not justify his failure to assign a value to the water itself or his reliance on groundwater as a substitute for SWP water when the Kern County basin was in an overdraft condition. This is especially the case since Mr. Herzog addressed the fact that almost half of the Kern County service area had no access to groundwater by

²⁴(...continued)
energy cost associated with pumping groundwater.

²⁵ Mr. Phillip D. Nixon, manager of the Lost Hills Water District, testified that the Lost Hills District had no access to groundwater in 1992, 1993, or 1994 because it was located outside the Kern County groundwater basin.

²⁶ Mr. William A. Taube, manager of Wheeler Ridge-Maricopa Water Storage District, testified, for instance, that the Wheeler Ridge district constructed six wells in 1991 and 1992 that produced 5,419 acre-feet of return flow (rather than native groundwater) at an average cost of \$134 per acre-foot in 1992 (or \$114 per acre-foot when adjusted back to the Delta). Similarly, Mr. James C. Josephson, a landowner in the Wheeler Ridge area, testified that the cost of running his well, built in 1991 and producing a little over 500 acre-feet of water, was \$128.32 per acre-foot, without figuring in capital repayment.

presuming that contractors with groundwater would essentially sell it to those without.²⁷

Mr. Krieger's approach, however, was not without its shortcomings. Defendant charged, as an initial matter, that Mr. Krieger's model ignored the fact that water would inevitably have been lost between the Delta and plaintiffs' service areas, with the result that plaintiffs claimed a greater amount of water than they would actually have received. Mr. Krieger's conclusions were additionally defective, defendant argued, because his interpretation of the reproduction cost approach unnecessarily accounted for the costs of reconstructing the SWP. Indeed, Mr. Krieger's upward adjustment to the Drought Water Bank prices based on the cost of reproducing DWR water supply contracts adopted an element that seemed arbitrary in amount and unreflective of what we believe to be the true costs of reproducing the water lost. Perhaps most troubling, however, Mr. Krieger's method led to a value higher than contemporaneous sales transactions would suggest was reasonable, with the strange result that plaintiffs would receive more per acre-foot of water under his calculations than they actually paid to the Drought Water Bank for a replacement unit of water.²⁸

²⁷ In order to get around the fact that almost half of the Kern County service area had no access to groundwater, Mr. Herzog proposed a scenario under which a contractor with access to both SWP water and groundwater would have sold its groundwater for \$55 (the cost of pumping plus a \$5 profit) to a contractor without access to groundwater. Under this hypothetical, Mr. Herzog presumed that both contractors would continue to pay the fixed costs associated with the SWP—approximately \$94 in 1992—as well as the variable costs associated with any SWP water deliveries received. Because the fixed costs associated with the SWP were “sunk” costs, Mr. Herzog maintained that Contractor A would have been willing to pay \$112 for its own unit share of SWP water while essentially reselling the unit (or its groundwater equivalent) to Contractor B for \$55 in order to capture the \$5 profit.

Regardless of the economic feasibility of this scenario, however (something plaintiffs seriously questioned), Mr. Herzog acknowledged that he could point to no sale of groundwater during the period in question by the entity that pumped the groundwater. Consequently, we find Mr. Herzog's hypothetical too speculative to overcome the objection that groundwater was unavailable to much of the Kern County service area.

²⁸ Tulare seeks recovery in the amount of \$85.55 per acre-foot for 1992, although it paid only \$81 per acre-foot (including transportation costs) for its Drought Water Bank purchases in that year. Similarly, Kern County claims \$89.45 per acre-foot in compensation, but paid only \$83 per acre-foot for its Drought Water Bank purchases in 1992.

In light of these difficulties, we are unable to conclude that either Mr. Krieger's or Mr. Herzog's valuation model accurately measured the fair market value of the water lost. A much better indication of value, we believe, are the prices set by the Drought Water Bank sales—arm's-length transactions that most closely approximate an open market for water at the precise time when plaintiffs would, as the result of ESA-imposed pumping curtailments, have entered such a market. Indeed, the use of the Drought Water Bank as a replacement market for water was more than theoretical: in the face of the ESA cutbacks, plaintiffs purchased some 110,000 acre-feet of water over the three-year period. Among the replacement options plaintiffs faced, in fact, the Drought Water Bank alone provided a substitute that was available to all plaintiffs.

Defendant argued, however, that the Drought Water Bank prices were not the result of competitive forces in an open marketplace, but were instead the product of a government program that stood between the buyers and the sellers and that added costs, such as contract administration expenses, that would not otherwise have been dictated by supply and demand. Yet, although DWR indeed acted as an agent for both the buyers and the sellers and in many ways monopolized the water sales during the years in question, there is every indication that the prices it set were the product of negotiated, arm's-length transactions with willing participants on either side. In both 1992 and 1994, for instance, prospective buyers authorized a price for Drought Water Bank water that was higher than they were ultimately required to pay. And in each of those years, prospective sellers rejected DWR's initial offers, negotiating for a 25-percent increase over DWR's originally proposed price. These facts convince us that the Drought Water Bank prices in fact reflected the going rate for water purchases at the relevant time.

Nor do we accept defendant's contention that the Drought Water Bank sales necessarily represented the upper end of the price scale or else they would have constituted a larger portion of overall water acquisitions. As plaintiffs pointed out, had groundwater been less expensive than water from the Drought Water Bank and had it been available to meet all of the counties' needs, there would have been no reason to buy Drought Water Bank water at all. The evidence demonstrates, however, that the Drought Water Bank sold some 332,251 acre-feet of water in 1992 and 1994. It is additionally worthy of note that the water contractors historically had relied on groundwater to meet their consumption needs independent of ESA-caused or naturally occurring shortfalls. (Groundwater comprised an average of 39.3 percent of the total water supply for the period 1970–1994, for instance, while SWP deliveries averaged only 21.5 percent.) We are therefore unable to accept the connection defendant draws between the amount of groundwater pumped and its cost relative to other water supply alternatives.

Choosing, then, to rely on the Drought Water Bank prices to calculate the value of plaintiffs' property interest, we thus conclude that the fair market value for plaintiffs'

Table A water was \$68.38 per acre-foot for 1992 and \$66.34 per acre-foot for 1994. Valuing Article 21 water for 1993 and 1994, however, presents a decidedly more difficult case.

Because 1993 was an exceedingly wet year, water contractors received the full amount of their Table A requests in 1993 and DWR had no reason to institute the Drought Water Bank. The water supply, in other words, more than met the demand for water and the best indication of market value—the Drought Water Bank—was therefore not in operation. In addition, Mr. Krieger testified that no other water sales occurred in early 1993 against which a price comparison could be drawn.

Complicating matters further, DWR was not yet aware, as of the date of the taking, that the year would be a wet one, with the result that it allocated only 40 percent of Table A requests in February and March and did not reach 100 percent of its allocations until April 21, 1993. Thus, while the increase in supply ultimately caused 1993 water prices to decline as the year progressed, this decrease in prices had not yet occurred as of the date plaintiffs urge us to measure the value of the water.

In defendant's view, the fair market value of Article 21 water was equivalent to the power costs of delivering the water, plus a reasonable profit. Plaintiffs, in turn, conceded that Article 21 water was delivered for an incremental cost approximately equal to the power cost of delivery, but insisted that the values of Table A water and Article 21 water were nevertheless identical. This was the case, plaintiffs maintained, because Article 21 water would not have been delivered unless the water contractor had paid its entire annual fixed cost for the SWP. Since the charge for Table A water above this fixed amount, like the cost of Article 21 water, was merely a variable charge (also reflecting the power cost of delivery), plaintiffs maintained that the two categories of water should be treated as having equal value.

Plaintiffs' position, however, is not one we can accept. We find it impossible, as an initial matter, to base values for the 1993 water loss on Drought Water Bank prices when the Drought Water Bank was not operated in that year. Common sense, as well as the most basic principles of supply and demand, preclude such an approach. In addition, the fact that DWR did not yet know as of February 1993 that the year would be a wet one does not change the fact that the water that would have been distributed was Article 21 water. This water, by definition, recognizes the existence of a surplus, at least with regard to the moment it is delivered. And while 1994 was ultimately not as wet as 1993, the fact that Article 21 water was made available demonstrates that excess water was indeed available in that year.

Given these facts, we have no doubt that the value of Article 21 water is less than

the value of Table A water due to its availability during times of abundant water supply conditions. Indeed, this observation would perhaps cause us to go so far as to assume that such water would command no price at all, under the theory that the overabundance rendered it valueless.²⁹ In reaching a conclusion about the market for interruptible water, however, we defer to the observations made by Mr. Herzog in his expert report, specifically, that demand for CVP and SWP interruptible water existed beyond what was delivered in both 1993 and 1994, that one could deduce from that fact that the market value of the water would likely have exceeded the cost of its delivery, and that the water could therefore have been sold at a profit. Based on a comparable sale of SWP water, Mr. Herzog identified a reasonable profit margin of \$3 per acre-foot, a number we now endorse as our own.³⁰

Having come to terms with Mr. Krieger's and Mr. Herzog's competing approaches to appraising plaintiffs' property right, we turn then to the two remaining areas of disagreement between the two experts: the date of the taking and the impact of water delivery costs on fair market value. As to the first point, our selection of the Drought Water Bank sales as the appropriate measure for fair market value renders the timing of the taking moot since the Drought Water Bank prices were uniform throughout both 1992 and 1994.³¹ As to the second point, we begin, as did the experts, with the location of the

²⁹ Mr. Krieger, we believe, expressed a similar concept when he testified that he had, on more than one occasion, assigned a zero value to water when appraising groundwater rights where the basin in question was in surplus, no adjudications had been made as to individual rights, and there was thus no limitation on water use.

³⁰ Mr. Herzog calculated the fair market value for Tulare's interruptible water as \$13 per acre-foot in 1993 (representing \$10 in delivery costs and \$3 in profit) and \$16 per acre-foot in 1994, while calculating the value of Kern County's interruptible water in 1994 as \$19. As with his approach to Table A water, however, Mr. Herzog subtracted the costs of delivery from these amounts to reflect the fact that Tulare and Kern County would have been responsible for variable costs associated with the water delivery.

³¹ Mr. Herzog identified the dates of valuation as February 14, 1992, February 12, 1993, and February 4, 1994, corresponding to the dates on which NMFS and USFWS issued their biological opinions. Mr. Krieger, in contrast, established a single date of taking, for valuation purposes, by assigning a number to each date affected by pumping restrictions, multiplying the number by the amount of water taken on that day, adding the products together, and then dividing the sum by the total number of days to produce a "weighted time factor" that established an average date of taking of April 3, 1992, February 10, 1993, and April 3, 1994. Such an approach was necessary, Mr. Krieger
(continued...)

taking as it effects the inclusion or exclusion of water delivery costs from just compensation.

In Mr. Herzog's view, the proper location for valuing the taking was in plaintiffs' respective service areas because physical ownership of the water did not change from DWR to plaintiffs under the contract until it reached the point of delivery. Consistent with this approach, Mr. Herzog valued the contractual entitlement by subtracting the costs of delivery from the Delta from the value of the groundwater in the service areas. Such an adjustment was necessary, Mr. Herzog explained, because a buyer would pay less for SWP water than for on-site groundwater because of the transportation costs attendant to the former.

In response, Mr. Krieger argued that the taking occurred not in the plaintiffs' service areas as Mr. Herzog had claimed, but rather in the Delta. As a result, rather than subtracting the cost of transporting the water between the Delta and plaintiffs' service areas, as did Mr. Herzog, Mr. Krieger added delivery costs to the value of the groundwater in the service areas to determine a value for the contractual entitlement.

In contrast to the experts, however, we do not find it appropriate either to add or subtract the costs of the water's transportation from the Delta. While the contracts specify that delivery is to be made to plaintiffs' service areas, plaintiffs would nevertheless have been responsible for the transportation costs of any water delivered. Awarding them the cost of transporting Drought Water Bank water from the Delta would thus afford them a double recovery, reimbursing them for costs for which they themselves would have been responsible.

Nor do we think it appropriate to subtract these costs from the fair market value of the water as defendant would have us do. Under their contracts, plaintiffs were entitled to the delivery of water to their service areas in exchange for their payment of both the fixed costs associated with the SWP and the variable water costs associated with the delivery of the water. Had no taking occurred, plaintiffs would have received a unit of water for a price equal to the sum of these costs. Since plaintiffs were obligated to pay the fixed costs of the SWP regardless of whether any water was delivered, however, plaintiffs' expenses to replace the taken water would have been comprised of this same fixed SWP price, the price paid for a unit of Drought Water Bank water, and the variable water costs associated with the delivery of the water. In order to restore plaintiffs to the financial

³¹(...continued)

argued, because changes in hydrological conditions throughout the year (and concomitant changes in prices) made the date chosen for valuation critical.

position they would have been in the absence of the taking, then, we are required to grant them only the price paid for the Drought Water Bank water.

We therefore conclude that plaintiffs are entitled to \$5,612,288.50 in compensation for their proportional share of the Table A water loss in April 1992 (\$68.38 x 82,075 acre-feet), \$103,200 for their Article 21 water loss in 1993 (\$3 x 34,400), \$8,019,975.28 for their Table A water loss in 1994 (\$66.34 x 120,892), and \$179,901 for their Article 21 water loss in 1994 (\$3 x 59,967), for a total of \$13,915,364.78, plus interest from the date of taking.

III. The Appropriate Rate of Interest

Having established the amount of compensation owed plaintiffs, we are left with the lone task of determining the appropriate rate of interest to be applied to this recovery. Plaintiffs urged that we employ the operating loan rate then prevailing in the Kern County/Tulare service area, an amount they identified as 1.5 percent above the prime rate published by the Federal Reserve. This is the appropriate rate, plaintiffs explained, because their water users, like most farmers, operated their businesses on credit and would have been required to assume additional loans to replace the water lost. Only by receiving this loan rate as interest on their award, plaintiffs maintained, would they be afforded the full value of their just compensation.

In response, defendant referred us to a number of cases applying the interest rate set forth by Congress in 40 U.S.C. § 258e-1 to inverse condemnation cases. In Petro v. United States, 47 Fed. Cl. 136 (2000), for instance, this court noted the “strong judicial policy in just compensation cases which favors uniform interest rates in order to avoid discrimination among litigants,” *id.* at 154, before concluding that the 1-year Treasury bill rate was the appropriate measure of interest in the taking of a right to sand and gravel.

Defendant’s position, we believe, is the correct one. We agree, as an initial matter, with the rationale set forth in Petro, favoring the use of a uniform system for calculating interest in the area of Fifth Amendment takings. Absent an indication that plaintiffs will not be made whole by the application of the statutory rate, we see no reason to resort to case-specific inquiries that lead to the disparate treatment of litigants. Plaintiffs offered no evidence that they in fact took out such loans or that the loans remain outstanding, thereby warranting the continued payment of interest at that operating loan rate. And while just compensation may mandate that the property owner be put in as good a position pecuniarily as it would have been had the taking not occurred, *id.* at 151 (citing United States v. Miller, 317 U.S. 369, 373 (1943)), that principle, we conclude, requires only that plaintiffs be given the interest rate afforded by statute.

Under the formula set forth in 40 U.S.C. § 258e-1, the calculation of interest includes the average of the 52-week Treasury bill rate for the period prior to December 21, 2000, and the weekly average 1-year constant maturity Treasury yield for the period after this date.³²

CONCLUSION

For the reasons set forth above, the court concludes that plaintiffs are entitled to damages in the amount of \$13,915,364.78, plus interest thereon to be calculated pursuant to the formula set forth in 40 U.S.C. § 258e-1. On or before February 2, 2004, the parties shall file a joint statement proposing the amount due plaintiffs, including interest, consistent with this decision.

³² The statute originally provided for an interest rate measured in the first year by the Treasury bill rate, with the interest on any period in excess of a year measured by the amount of the principal plus accrued interest, also at the Treasury bill rate. 40 U.S.C. § 258e-1. A December 21, 2000, amendment, however, specified that the interest rate would be based upon “the weekly average 1-year constant maturity Treasury yield, as published by the Board of Governors of the Federal Reserve System, for the calendar year preceding.” Pub. L. No. 106-554, § 307, 114 Stat. 2763 (2000).