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SUPREME COURT, U.S.

In The

Supreme Court of the United States

STATE OF KANSAS,

Plaintiff,

v.

STATE OF COLORADO,

Defendant,

and

UNITED STATES OF AMERICA,

Defendant-Intervenor.

ARTHUR L. LITTLEWORTH, Special Master
THIRD REPORT

August 2000

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SECTION VIII

SECONDARY ECONOMIC DAMAGES

The Kansas claim includes secondary or indirect losses to the economy of the state as a whole. These are damages that result from the direct impacts of depletions of usable Stateline flows, namely, crop losses and increased pumping costs within the ditch service areas, and additional regional pumping costs caused by lower groundwater levels. If any change is made in these direct impacts, the secondary damages will also be affected. Kansas estimates its secondary economic losses at $3,793,486. Kan. Exh. 1092, Table D6. This amount includes both historic and projected future damages, each brought to a 1998 dollar value, and includes prejudgment interest for the historic period of 1950-94.

Colorado does not have an estimate of secondary damages. While Professor Wichelns acknowledges that "there may have been some secondary economic effects" due to depletions of surface supply, he believes they would have been "very, very small." RT Vol. 193 at 81. In his opinion, there is no method to estimate such effects accurately, and they should not be addressed. *Id.* at 97.

Kansas employed two specialist experts to assist in calculating secondary damages, Professor Joel R. Hamilton and Dr. M. Henry Robison. Both hold impressive credentials.[17] Colorado chose not to engage a separate

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[17] Hamilton's qualifications are found in Kan. Exh. 938. He is a Professor of Agricultural Economics and Statistics at the University of Idaho; has international experience in China, Sri Lanka, Pakistan, India, Eastern Europe, and Australia. He

expert for secondary damages, and Professor Wichelns who was Colorado's chief economic expert on all other issues had only limited experience with input-output models. Rather, Colorado chose to rely primarily on vigorous cross-examinations of Professor Hamilton and Dr. Robison, and upon a legal objection made to all of Kansas' expert testimony on secondary economic impacts,

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testified for the State of New Mexico on secondary economic damages in *Texas v. New Mexico*. He has written numerous peer reviewed articles on secondary economic impacts, many of which involve the kinds of issues present in this case. Most recently, as Chair of the Independent Economic Analysis Board of the Northwest Power Planning Council, he provided technical review and oversight of the economic studies on proposals to "breach" four dams on the lower Snake River. These studies are being conducted by the U.S. Army Corps of Engineers as part of a potential salmon recovery project. Breaching the dams would essentially eliminate water storage, and reduce the water supplies for agriculture and hydro power. RT Vol. 206 at 33-34. The input-output model being used to assess secondary economic impacts from these proposals is IMPLAN, the same model used by Kansas experts in this case, and the model looks 100 years into the future. Kan. Exh. 1084; RT Vol. 206 at 35-36, 72-73.

Dr. Robison is President of Economic Modeling Specialists, Inc. His qualifications appear in Kan. Exh. 961. He is the person who constructed the regional IMPLAN model used in this case to assess secondary economic impacts in Kansas. He has constructed hundreds of IMPLAN models for the U.S. Forest Service and for the Department of Commerce, and currently has a major assignment for the Federal Highway Administration. He has also assessed secondary economic impacts, using IMPLAN, for the States of Idaho, Utah, Colorado and New Mexico, and for many cities and regional governmental agencies. His writings in peer reviewed journals address many of the issues involved in this case.

based upon the standards in *Daubert* and *Kumho Tire Co.*[18] The Colorado objection was overruled by written Order dated May 1, 2000, and included as Exhibit 8 in the Appendix.

In assessing secondary impacts to the economy of Kansas as a whole, the Kansas experts used an input-output form of analysis that is generally recognized in the field of economics. Specifically, they employed an input-output model known as IMPLAN. This is a national level model originally developed by the U.S. Forest Service and now maintained by the Department of Commerce. Kan. Exh. 892, Section D at 5; RT Vol. 186 at 57, 61-62. It has now been coupled with county level economic data made commercially available by the Minnesota IMPLAN Group, located at the University of Minnesota. Kan. Exh. 962, RT Vol. 186 at 59. Dr. Robison, personally, has constructed hundreds of IMPLAN models to assess secondary economic impacts for various departments of the federal government, for several states, and for numerous local agencies. RT Vol. 186 at 50-52; Kan. Exh. 961. IMPLAN is the "most widely used" model for assessing secondary economic impacts. RT Vol. 185 at 80; RT Vol. 186 at 26. More information on input-output modeling appears in my Order on Colorado's *Daubert* motion, included as Exhibit 8 in the Appendix.

Dr. Robison constructed the model used by Kansas in this case. It traces the ripple effects of the depletions

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[18] *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 125 L.Ed.2d 469, 113 S.Ct. 2786 (1993); *Kumho Tire Co., Ltd. v. Carmichael*, 526 U.S. ___, 143 L.Ed.2d 238, 119 S.Ct. 1167 (1999).

within the ditch service areas, and upon the adjacent region, throughout the statewide economy. Some of these impacts are regarded as "gains" while some are "losses." Increased pumping expenses and less net farm income within the ditch service areas are adverse to one sector of the economy, but advantageous to the segment that profits from increased well pumping.[19] The model determines the net effects, and in this case calculates, overall, net losses to the Kansas economy. Kan. Exh. 892, Section D at 9-12; RT Vol. 206 at 16-17. A summary of the gains and losses appears in Kan. Exh. 1092, Table D6.

It is ironic that professional economists treat the economic activity associated with the additional use of groundwater, that is, with a permanent exhaustion of a natural resource, as an economic "gain" which is to be offset against an acknowledged "loss" of net farm income. Nonetheless, this appears to be an accepted practice, and in this case represents a conservative approach to Kansas' damages.

Secondary economic impacts are also affected by a concept known among economists as "opportunity costs."[20] This term refers to the "next best alternative employment of a resource," and is a method for reducing

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[19] Dr. Robison testified, "It's the old irony with economists. Even a tornado benefits windowpane sellers. And there's no doubt that if you deprive the Kansas economy of water, you'll benefit pump dealers." RT Vol. 186 at 120.

[20] This is slightly different from the use of the term in connection with prejudgment interest, where it relates to the investment opportunities of funds which a person should have had.

gross secondary impacts to the net gains or losses affecting an economy. RT Vol. 185 at 131, 144. In this case, the Kansas experts determined that opportunity costs offset all but 20 percent of the secondary impacts. That is, 80 percent of secondary impacts were assumed to represent factors moving to or from the next best opportunities elsewhere in the economy. Kan. Exh. 892, Section D at 7. Only 20 percent of the total secondary impacts were counted as net gains or losses. *Id.*; RT Vol. 185 at 124. Some economists have argued that this is "too restrictive," and that a larger percentage should be used to determine net secondary impacts. Kan. Exh. 947; RT Vol. 185 at 116-18.

On cross-examination, however, Colorado suggested that the 20 percent factor should be lower, or at least that it was not proven with reasonable certainty. Colorado offered no figure of its own. While the 20 percent factor is based upon the analyst's judgment, there is ample evidence to support its use. RT Vol. 206 at 88. The seminal work on the subject is a book by Haveman and Krutilla evaluating opportunity costs for the kinds of resources used in water projects. Kan. Exh. 949; RT Vol. 185 at 105. Their study involved some 100 projects in all parts of the country. RT Vol. 185 at 105-108. Opportunity costs ranged from 69 to 94 percent; that is, net secondary impacts fell between 6 and 31 percent. Kan. Exh. 949, Table 21; RT Vol. 185 at 147. Support for 20 percent can also be found in *Texas v. New Mexico*, where experts for both states used 20 percent (RT Vol. 185 at 120; RT Vol. 206 at 24); the Colorado-Big Thompson project, 20 percent (RT Vol. 185 at 131); the State of Washington study in regard to a prohibition on grass seed burning, low of 20 percent (Kan. Exh.

1085; RT Vol. 186 at 33); Bergmann and Boussard international study in France, 10-20 percent (Kan. Exh. 1004; RT 206 at 9-10); Bureau of Land Management Study on making additional land available for agricultural irrigation, 10-20 percent (Kan. Exh. 944; RT Vol. 185 at 96).

In the final analysis, Colorado argues that the Kansas evidence on secondary economic impacts is not sufficiently reliable or certain to support a damages award. Colo. Closing Br. at 102. It is true that the Kansas damage claim is an estimate, and involves the judgment of its experts. But the law does not require that scientific testimony be known "to a certainty." *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 125 L.Ed.2d 469, 113 S.Ct. 2786 (1993). Although "good grounds" must support an expert's testimony, the process followed is also important. *Id.* at 590. Here, the Kansas experts used a methodology, and a specific input-output model, that have been "widely adopted and widely accepted" for measuring secondary economic impacts, and constitute the "most reliable" approach that can be used. RT Vol. 186 at 26; RT Vol. 187 at 50; RT Vol. 206 at 10-11; Kan. Exh. 1010. The Kansas experts testified that the results provide a "reasonable estimate" of secondary impacts and a "reasonable quantification" of damages. RT Vol. 206 at 16, 38; RT Vol. 187 at 50-52. The very input-output model, and the very people, used by Kansas to assess secondary impacts here are currently being used extensively by the federal government for the same purpose. The approach of the Kansas experts was conservative and professional. We can anticipate that their testimony will be carefully examined in the profession because of the time span over which the input-output analysis has been used. However,

there is now evidence the Corps of Engineers is using IMPLAN to look ahead 100 years. Kan. Exh. 1084; RT Vol. 206 at 35-36, 72-73. And current models are much more accurate than those used even ten years ago. RT Vol. 187 at 37.

A. Conclusion.

I find that the weight of the evidence supports the Kansas claim for secondary economic damages. They may have to be recalculated, depending upon any revisions to the underlying damages, but the methodology used by the Kansas experts should be employed in making any such final damage estimates.