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Report to the Chairman, Environment,
Energy, and Natural Resources
Subcommittee, Committee on Government
Operations, House of Representatives

June 1988

WATER RESOURCES

Issues Concerning the Arkansas River Basin Operation Plan



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Resources, Community, and
Economic Development Division

B-221499

June 23, 1988

The Honorable Mike Synar
Chairman, Environment, Energy, and
Natural Resources Subcommittee
Committee on Government Operations
House of Representatives

Dear Mr. Chairman:

Our July 17, 1987, report to you provided information on seven issues relating to the Corps of Engineers' efforts to deal with the significant flooding that occurred as a result of record-level rainfall during 7 days in late September and early October 1986 in northeastern Oklahoma.¹ This report addresses three additional issues you asked us to examine regarding the 11 reservoirs in the Arkansas River Basin where most of the severe flooding occurred: (1) whether the Corps' operation plan for the Basin accurately reflects authorized purposes and actual uses of these reservoirs, (2) the Corps' methodology for estimating benefits and damages resulting from a July 1986 modification to the operation plan that called for slowing the rate of water release after flood events, and (3) the Corps' compliance with the Administrative Procedure Act in adopting the modification, especially whether the Corps provided sufficient opportunity for public comment.

Our work showed that:

- While flood control is a legislatively authorized purpose for all 11 reservoirs, navigation is an authorized purpose for only 3. Nevertheless, the Corps' plan calls for operating the other eight reservoirs for navigation purposes as well. Although reservoirs can be operated for multiple purposes, we believe the Corps does not have sufficient authority to operate reservoirs for the benefit of a purpose not specifically authorized by legislation unless it can be shown that such purpose is not detrimental to an authorized purpose. The compatibility of currently authorized and unauthorized uses is being determined as part of a comprehensive Corps study of water resource concerns in the Arkansas River Basin. The study is scheduled for completion in 1990.
- The Corps' analysis of the benefits and damages resulting from the July 1986 modification to the operation plan used incomplete data, resulting

¹Water Resources: Corps of Engineers Management of 1986 Flooding in Northeastern Oklahoma (GAO/RCED-87-173BR, July 17, 1987).

in understated hydrologic and economic estimates. The Corps study due in 1990, however, will be based on updated hydrologic and economic data.

- The Corps did not have to comply with the Administrative Procedure Act requirements for public notice and comment because the modification involved "public property," which is exempt from the act. The Corps, however, solicited comments from specific organizations and individuals having an interest in the modification. The Corps has also established a coordination committee comprised primarily of Oklahoma and Arkansas state officials and interest groups to recommend necessary changes to the plan. This committee found no basis for changing the plan at this time and endorsed its temporary use pending the results of the Corps' study.

We are recommending that, if information developed as part of the Corps' study indicates that releases for navigation purposes are detrimental to flood control, the Secretary of the Army not use the reservoirs in this manner unless specific legislative authority is obtained.

Background

Flows on the main stem of the Arkansas River are controlled primarily by 11 projects: Copan, Hulah, Oologah, Kaw, Keystone, Pensacola, Markham Ferry, Fort Gibson, Tenkiller, Eufaula, and Wister. Together, these projects can store about 7.6 million acre-feet of water for flood control. These dams and reservoirs, built and operated by the Corps of Engineers, were authorized by various acts of Congress. The legislation specifies that each project has certain specified purposes such as flood control and hydropower, but the authorized purposes are not the same for every project.

The Corps initiated a study of the Arkansas River Basin System in January 1986 to address concerns about the impact of high-flow days on navigation and farming interests. The study's objective was to develop a reservoir operation plan that would minimize the number of high-flow days without causing significant adverse impacts to other users of the reservoirs, the river, or the environment.

As a result of the study, the Corps adopted a "fine tuning" modification of the Arkansas River Basin Water Control Master Manual (system operation plan) effective July 1, 1986. The modification affects the regulation of flood control storage on all 11 projects. Under the modified plan, the rate of water flow released from the reservoirs after flood events is slowed whenever the water levels in the reservoirs recede to a certain

point. The slower flows help reduce shoaling (shallow water caused by shifting sediment) in the navigation channel and enable navigation to resume earlier. However, the slower flows also cause the flood waters in the reservoirs to recede more slowly. In the event of further flooding, less reservoir storage space is available to contain the additional flood waters, which may be detrimental to the reservoir's flood control function.

As noted in our July 1987 report, the modification did not adversely affect the September-October 1986 flooding because it was not invoked until November 11, 1986.

Reservoirs Used for an Unauthorized Purpose

You asked us to determine whether the modified operation plan accurately reflects the authorized purposes and priority uses of each of the 11 reservoirs located in the area where most of the severe flooding occurred. In our opinion, the Corps lacks sufficient authority to operate 8 of the 11 reservoirs in the Basin for navigation purposes when such operation is to the detriment of a purpose included in the authorizing legislation.

The River and Harbor Act of 1946 authorized the construction of projects on the Arkansas River and its tributaries in accordance with a multipurpose plan recommended in a September 1945 report by the Corps' Chief of Engineers. The report did not recommend that each of the reservoirs serve the same purposes. It carefully considered the uses of each individual reservoir, including multiple purposes where feasible.

The 1946 act includes the authorized purposes for 7 of the 11 reservoirs—the Oologah, Keystone (originally named Mannford), Eufaula, Markham Ferry, Fort Gibson, Tenkiller, and Pensacola. Flood control is an authorized purpose for all seven. Each of the seven reservoirs has at least one additional authorized purpose, but navigation is authorized for only three. (See table 1.)

Similarly, the Flood Control Act of 1936 authorized flood control and two other purposes for the Hulah Reservoir, the Flood Control Act of 1938 authorized the Wister Reservoir for flood control and water supply, and the Flood Control Act of 1962 authorized the construction of the Copan and Kaw Reservoirs for flood control and four other purposes. None of these three acts, however, authorized navigation. (See table 1.) In 1971, the navigation features of the Arkansas River system were named the McClellan-Kerr Arkansas River navigation system by

Public Law 91-649. The act, however, did not add or change any project authorizations.

Table 1: Authorized Project Purposes

Project	Flood control	Navigation	Hydropower	Recreation	Water quality	Water supply	Fish and wildlife
Copan	X			X	X	X	X
Hulah	X				X	X	
Oologah	X	X			X		
Kaw	X			X	X	X	X
Keystone	X	X	X			X	X
Pensacola	X		X				
Markham Ferry	X		X				
Fort Gibson	X		X				
Tenkiller	X		X			X	
Eufaula	X	X	X			X	
Wister	X					X	

Source: U.S. Army Corps of Engineers.

Since navigation is authorized for only 3 of the 11 reservoirs, we determined if the Corps' discretionary authority permits it to operate a reservoir for a purpose not specifically authorized in the enabling legislation. We identified four court cases that are relevant and establish precedent.²

The cases indicate that changes in the operation of a dam and reservoir may properly be within the Corps' discretionary authority only if such changes are also within the scope of the project's authorized purposes. Since the operation plan benefited navigation, which is not in the authorizing legislation for 8 of the 11 reservoirs, it is our opinion that the Corps does not have the authority to operate the 8 reservoirs for this purpose if it is to the detriment of an authorized purpose. The degree to which navigation and other uses are compatible is being determined in an ongoing Corps study discussed later in this report.

On May 2, 1988, the Assistant Secretary of the Army (Civil Works) provided us with the opinion by the Corps' Chief Counsel on the use of the 11 reservoirs for navigation purposes. According to the Chief Counsel,

²United States v. 2,606.84 Acres of Land in Tarrant County, Texas 432 F.2d 1286 (5th Cir. 1970), cert denied, 402 U.S. 916 (1971); Creppel v. U.S. Army Corps of Engineers 670 F. 2d 564, 573 (5th Cir. 1982); Britt v. U.S. Army Corps of Engineers 769 F. 2d 84 (2d Cir. 1985); and State of Missouri Ex Rel. Ashcroft v. Department of the Army 672 F. 2d 1297 (8th Cir. 1982).

the Arkansas River Basin projects were developed as integral parts of comprehensive, multipurpose plans under which the Corps is allowed to use its discretion in modifying the plans and operations, thus supporting the use of all the reservoirs for the benefit of navigation. The Corps' analysis chiefly relied on the Ashcroft and Tarrant County cases to support the system modification. However, we believe these cases indicate that while the Corps has broad authority to carry out project purposes, it cannot use the projects for unauthorized purposes when such use is to the detriment of authorized purposes.

Corps Study Used Incomplete and Obsolete Data

You asked us to determine the methodology the Corps used to estimate benefits and damages resulting from the July 1986 modification to the operation plan. The Corps used computer modeling to simulate the effects of system changes under different scenarios using events that occurred during the 35-year period from 1940 to 1974. The resulting cost comparisons the Corps made between the proposed modified plan and the system operation plan then in use, therefore, were based on incomplete data.

Much of the responsibility for the Corps' 1986 study of the Arkansas River Basin System Operation Plan was assigned to the Corps' Tulsa District Hydrologic Modeling Center. With computer modeling, the Center can mathematically simulate the operation of a system of reservoirs to evaluate flood control, hydropower, water supply, flow requirements, and navigation parameters from hydrologic and economic viewpoints.

Corps officials advised us that their study was intended to show comparative results of the operation plan used by the Corps during the period 1979-86, versus the proposed modified plan. The Center generated 27 computer runs that simulated the effects of changing the system operation plan under seven separate scenarios.

The validity of the outputs obtained from the Center's computer simulations depended heavily on the validity of the hydrologic and economic data inputs. The data used, however, were incomplete. For example, the hydrologic (rainfall and flood events) data were from the 35-year period ending in 1974. The economic data used to assess flood damages to existing structures were developed from field survey reports completed in the 1950s and 1960s which would not include the structures built in the Arkansas River Basin in the last 20 to 30 years. Corps officials agreed that, to the extent such structures are not included, the estimates are understated. According to the Corps, these data were used because

they were the most recent hydrologic and economic information available in the Center's computerized data base.

Reservoir area damage comparisons were also understated and not reflective of current conditions. According to the Chief, Tulsa District Reservoir Control Section, the comparisons were based on data collected during a 30-day period in September 1975 by project managers at 5 of the 11 reservoirs in the Arkansas River Basin System—Keystone, Oologah, Tenkiller, Fort Gibson, and Eufaula—as part of a Corps study. The data collected represented each project manager's best estimate of possible reservoir area damages, but the accuracy and completeness of each of the estimates appear questionable. For example, a Fort Gibson reservoir engineer stated that his input did not include estimates for damage to concession facilities and loss of revenue due to high water. Nevertheless, the Corps used these data 11 years later in 1986 as part of the data base to compute reservoir area damage cost comparisons.

Concerning navigation benefits, Corps district officials told us that they gathered data in 1986 from operators of tugboats, towboats, and barges to determine average operating costs for various types and sizes of vessels at various water flow levels. We could not evaluate the vessel operators' data, however, because the Corps could not locate the information.

Corps Study Will Address Water Resource Concerns

On March 11, 1982, the House Committee on Public Works and Transportation adopted a resolution that requested the Corps, in cooperation with the states of Arkansas and Oklahoma and other entities, to determine whether the operation of the Arkansas River Basin System should be modified. To evaluate the potential for improvements to the system, the study is to include a comprehensive review of the storage, conservation, treatment, and conveyance of water in the Basin for municipal, industrial, agricultural, and other uses. This study will address additional operation plans, modifications to existing projects to increase storage, storage re-allocation, potential reservoir and levee projects, and the reconstruction of existing levees in Arkansas. Corps Southwestern Division officials told us that, as part of this comprehensive study, the Hydrologic Modeling Center has updated its computerized data base to include hydrological and economic data from 1940 through 1986; thus the September-October 1986 flood data will be included.

The Corps has completed a draft report that discusses the general issue of how navigation should fit into the operation plan for the Basin. The

draft has been sent for comment to various interested parties in Oklahoma and Arkansas, and the comments are to be discussed in a June 1988 meeting with the Arkansas River Basin Coordination Committee. The Corps plans to incorporate this information into the comprehensive report, currently scheduled for issuance in 1990.

Opportunity for Public Comment

You asked us to determine whether the Corps complied with the applicable provisions of the Administrative Procedure Act in adopting the July 1986 modification, particularly with regard to providing sufficient opportunity for public comment. We found that the modification involved "public property," which is exempt from the act's notice and hearing requirements. The Corps, however, did solicit comments from interested organizations and individuals.

In our opinion, the Corps' 1986 modification was not subject to the public notice and hearing requirements of the act (Section 553, Title 5 of the United States Code). The act requires federal agencies to publish a general notice of proposed rulemaking in the Federal Register, and afterwards to give interested persons the opportunity to participate in the rulemaking. However, federal agencies need not comply with section 553 when the rulemaking action involves a matter relating to agency management, personnel, loans, grants, benefits, contracts or public property. We consider the Arkansas River Basin System to be "public property" and therefore not subject to section 553 requirements.

Corps Requested Public Comments

The Corps, however, solicited public comments on the proposed draft of the operation plan modification under its Engineering Regulation 1110-2-240, which provides division commanders with general guidance on how reservoir operation plans will be developed. It suggests close coordination with all basin interests that are or could be affected by, or have an influence on, project regulation, including all appropriate international, federal, state, regional, and local agencies. Division commanders are authorized to approve operation plans, but the regulation does not specify how the notification process should be carried out, nor who should be contacted prior to adopting an operation plan modification. Such decisions are left to the commanders' discretion.

Before it formulated the modification, the Corps met with a group representing area navigation, farming, and flood control interests in January 1986. In March 1986 it met again with this same group and others to

present its proposed modification and formally solicit their written comments. In April 1986 the Corps issued its notice of intent to modify the system operation plan and solicited comments from 67 individuals who had interest in and knowledge of reservoir operations. It chose these individuals under its discretionary authority.

The Corps received written comments from 4 respondents from its initial meetings with interested parties and from 17 respondents as a result of the notice of intent. Twelve of the respondents expressed various concerns about the effects of the modification and/or believed there was a need to reevaluate all basin operations. We were able to interview 8 of the 12 respondents that expressed concern to determine how they perceived the Corps' responsiveness. Three considered the Corps' response adequate, one said that he considered the Corps' response inadequate but that the Corps' current comprehensive study will address his concerns, and four individuals could not recall the Corps' response. (App. I gives a more detailed account of the Corps' efforts to solicit comments and the nature of the comments.)

In July 1986 the Corps adopted essentially the same modification as proposed in its April 1986 notice of intent. However, in announcing its adoption of the modification, the Corps cited two specific efforts it had undertaken to address concerns expressed over (1) the perceived permanency of the modification and (2) the need for a complete reevaluation of basin operations. The Corps stated that it established an Arkansas River Basin Coordination Committee, comprised primarily of Oklahoma and Arkansas state officials and interest groups (representing water, recreation, agriculture, fish and wildlife, regional development, and navigation), to periodically review and advise the commander regarding operation of the modified plan. The committee was to recommend necessary changes to the plan if unforeseen problems occurred. The Corps also summarized plans for its comprehensive study of the Arkansas-Oklahoma area of the Arkansas River Basin, including a complete reevaluation of the area, focusing primarily on navigation and water flow management problems.

The Arkansas River Basin Coordination Committee met in January 1987 to assess the modified operation plan in the context of the September-October 1986 flood. The committee found no basis for changing the plan and endorsed a temporary continuation of its use until the comprehensive study either confirmed its continuation or recommended abandonment or modification as appropriate.

Conclusions

While reservoirs in the Arkansas River Basin System are intended to operate within a complex river system serving multiple purposes, not every reservoir was authorized for every possible purpose. Flood control is an authorized purpose for all 11 reservoirs in the system, but navigation is authorized for only 3 reservoirs. Under the operation plan, however, the Corps operates the other eight reservoirs for navigation purposes that are not legislatively authorized. In our view the Corps does not have sufficient authority to operate the reservoirs for purposes not specifically authorized by legislation unless it can be shown that such purposes are not detrimental to authorized purposes. Accordingly, we believe the Corps could continue to use the eight reservoirs for navigation if it can show that such use is not detrimental to authorized purposes. If not, the Corps cannot properly continue the navigational uses in the absence of specific legislative authority.

Slowing the rate of water flow from the reservoirs after flood events to enable navigation to resume earlier may be detrimental to their flood control function because less storage space is available in the event of further flooding. As the Corps' study due to be issued in 1990 progresses, the Corps should have information available before then on whether navigation can be compatible with flood control purposes or is detrimental to such purposes.

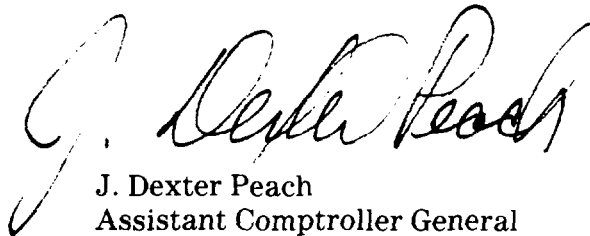
Recommendation

If the Corps' information indicates that the operation of the Arkansas River Basin operation plan for navigation is not detrimental to the reservoirs' flood control functions, the Corps can continue the navigational uses in the current operation plan. If the Corps' information shows detriment, we recommend that the Secretary of the Army direct the Corps' Chief of Engineers to discontinue the reservoirs' use to benefit navigation unless the Corps can obtain legislative approval to add navigation as an authorized purpose for the eight reservoirs.

Our work included (1) reviewing authorizing legislation, court decisions and case law, the Corps' cost comparison of the plan modification, and Corps regulations and (2) discussions with Corps, state, and private interest group officials. (A more detailed description of our scope and methodology is contained in app. II.) As you requested, we did not obtain official agency comments on a draft of this report. However, we discussed the information in the report with Corps officials and made changes where appropriate. As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of

this report until 30 days from the date of this letter. At that time, we will send copies to the Secretary of Defense, the Secretary of the Army, and other interested parties. Major contributors to this report are listed in appendix III.

Sincerely yours,



J. Dexter Peach
Assistant Comptroller General

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Abbreviations

GAO General Accounting Office
RCED Resources, Community, and Economic Development Division

Details of the Comments Received on the Modification

In a January 29, 1986, meeting with navigation, farming, and flood control interests from Oklahoma and Arkansas, the Corps' Southwestern Division Commander agreed to study the system operation plan for regulating the flow of water in the Arkansas River Basin. The meeting attendees included individuals representing the Oklahoma Tourism and Recreation Department, the Oklahoma Water Resources Board, the Arkansas Waterways Commission, the Arkansas Basin Development Association, two Oklahoma port authorities, five Arkansas state and federal elected legislators, and seven Corps officials.

On March 14, 1986, the Corps met with essentially the same group, plus a representative of the Red-Ark Development Authority and a member of the press, to discuss the Corps' proposal to change the system operation plan for regulating water releases. On March 28, 1986, the Corps sent copies of a draft document discussing its proposed change to participants of the two meetings. The Corps asked recipients for their reaction to the proposal but directed the recipients not to circulate the draft because the Corps wanted to obtain comments from other interested parties later on.

The Corps received four written responses to the draft, all from interested parties in Oklahoma. Each respondent expressed concern that the Corps did not have sufficient information about the positive and/or negative impacts of the proposed change, and three suggested the Corps conduct additional studies or a complete reevaluation to obtain more data concerning the impacts of the proposed modification. Two of the respondents stated they would support the plan for an interim period not to exceed 18 months if the Corps would conduct a complete basin reevaluation and exempt Wister Lake and Eufaula Lake from any change during the interim period.

Two comments in particular merit specific mention. The Executive Director of the Oklahoma Water Resources Board questioned the Corps' authority to adopt a change benefiting navigation because only 3 of the 11 reservoirs affected by the modification include navigation as an authorized purpose. Also, the Executive Director of the Red-Ark Development Authority wanted to know when the total cumulative impact of a number of small operation plan changes made under the Corps' discretionary authority would be evaluated. He was concerned that relatively small incremental changes made over several years may be permissible under the Commander's discretionary authority, but when considered collectively may constitute a "significant" change that requires compliance with the rule-making provisions of the Administrative Procedure

**Appendix I
Details of the Comments Received on
the Modification**

Act. Although the Corps made several technical and editorial changes, it did not make any substantive changes to the proposed modification that it circulated for comment.

The Corps sent copies of its April 16, 1986, Notice of Intent to modify the system operation plan to a total of 67 individuals and agencies who had interest in and knowledge of reservoir operations, and to congressional delegations representing Oklahoma and Arkansas. The mailing list was based on input received from the Corps Commanders of the Tulsa and Little Rock Districts. The Tulsa District Commander's proposed mailing list was limited to state and federal government agencies and congressional delegations, lake associations, and port authorities and did not include city governments, homeowner associations, and the news media. The Little Rock District's mailing list was similar to Tulsa's. Recipients were given 30 days to comment.

The Corps received 17 written responses. Five expressed no objection to implementation of the proposed modification and 12 expressed various concerns. Some reiterated their earlier concerns relating to the permanency of the plan, whether the entire basin should be reevaluated, the cumulative effect of small incremental changes, and the Corps' use of insufficient data for its analyses. Others voiced concern over the Corps' need to address the impacts of the modification on tourism, recreation facilities, fish and wildlife, the environment, and the economy.

Objectives, Scope, and Methodology

In response to your request of October 8, 1986, and discussions with your office, we addressed three issues relating to the 11 reservoirs in the Arkansas River Basin: (1) whether the Corps' Arkansas River Basin Operation Plan accurately reflects the authorized purposes and priority uses of each of the 11 reservoirs; (2) the Corps' methodology for estimating benefits and damages resulting from a July 1986 modification to the operating plan that called for slowing the rate of water release after flood events; and (3) whether the Corps complied with the Administrative Procedure Act in adopting the modification, particularly with regard to providing an opportunity for public comment.

We reviewed the authorizing legislation for each of the 11 reservoirs—Copan, Hulah, Oologah, Kaw, Keystone, Pensacola, Markham Ferry, Fort Gibson, Tenkiller, Eufaula and Wister—to obtain the purposes for each of the projects. We reviewed applicable court decisions and case law to determine the extent of discretionary authority available to the Corps in authorizing and implementing changes to reservoir system operating plans.

We obtained and analyzed the documentation used by the Corps to compute the damage and benefits that would result from the modification. We visited the Corps' Hydrologic Modeling Center in Tulsa, Oklahoma, to obtain an understanding of the methodology used by the Center to generate computer simulations of the effects of changing the Arkansas River Basin Operation Plan under various scenarios. We obtained detailed briefings and held extensive discussions with Southwestern Division Corps personnel in Dallas, Texas, and Corps District personnel in Tulsa, Oklahoma, and Little Rock, Arkansas, who participated in drafting the modification and analyzing its impact. We also discussed the modification with officials of three Oklahoma state agencies, four Arkansas state agencies, and representatives of six private interest groups in Oklahoma.

We researched the statutory applicability of the Administrative Procedure Act and relevant case law to determine whether the public notice and hearings provisions of the act should have been followed. We reviewed the Corps' regulations and methodology for obtaining public comments and analyzed the comments received and their disposition by the Corps. We interviewed eight state officials and representatives of private industry regarding their concerns with the modification and the Corps' responsiveness to those concerns.

Appendix II
Objectives, Scope, and Methodology

We performed our work during the period from September 1987 to March 1988 in accordance with generally accepted government auditing standards.

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