DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
WASHINGTON

In Reply Refer To:
ENGWD 3 July 1951

Honorable Michael W. Straus
Commissioner of Reclamation
Bureau of Reclamation
Department of the Interior
Washington, D.C.

Dear Mr. Straus:

Reference is made to your letters of 30 January 1951 to the Secretary of the Army and to the Chief of Engineers, enclosing for the information and comments of the Department of the Army, in accordance with Section 1 of the Flood Control Act of 1944, copies of your report dated December 1950 on the Colorado River storage project and participating projects in the upper Colorado River Basin. Reference is also made to subsequent letters furnishing copies of individual reports on the participating projects. I have been directed by the Secretary of the Army to furnish you the views of the Department of the Army on your report. You state in your letter to the Secretary of the Army that your report will be sent to the President and to the Congress under the provisions of Section 9a of the Reclamation Project Act of 1939.

Your report recommends a combination of dams, reservoirs, power plants, and other appurtenant structures in the upper Colorado River Basin which together make up what you refer to as the "Upper Colorado River storage project and participating projects." Some of the participating projects are located outside the physical limits of the upper Colorado River Basin. The purpose of the structures recommended in your report would be primarily power and irrigation and incidentally river regulation, fish and wildlife benefits, recreation, sediment control, flood control, and mineral development.

The main storage project consists of ten dams and reservoirs totaling in cost $1,139,100,000. The report also recommends twelve participating projects, including two already authorized, totaling in cost $383,188,800. The total cost of the plan recommended for approval, therefore, is $1,422,288,800, including the cost of the two participating projects already authorized, $12,177,000. One of the participating projects, the Central Utah Project, is included only to the extent of its initial phase, estimated at $322,915,000.
The remaining cost of the Central Utah Project, after the initial phase, is shown in your separate report on the Central Utah Project to be $812,085,000. Adding the cost of the remainder of the Central Utah Project to the cost of the plan recommended for approval in your report gives a grand total of approximately two and one-quarter billion dollars. In addition, mention is made in the report of certain dependent projects which may be authorized subsequent to the authorization of the storage and participating project. The additional cost of these dependent projects is not given. In your recommendation you ask approval of the entire plan ($1,432,288,800) and immediate authorization for construction, operation, and maintenance of five of the dams and reservoirs in the storage project and all the participating projects. The cost of the five dams and reservoirs recommended for immediate authorization and the ten participating projects not yet authorized is $996,000,000.

In addition to the authorization for the project works, your report requests authority for the Secretary of the Interior to establish an Upper Colorado River Account which, in general, is to be credited with power revenues and charged with the costs allocated to power and the costs of that portion of the irrigation allocation to local interests which cannot be paid by local interests. The account is also to be charged with certain special funds to be available for expenditure by the Secretary of the Interior. Your report also recommends certain provisions to be applied to several individual projects, including the Shiprock Indian irrigation project and Florida and Pine River extension projects. The report recommends the inclusion of recreational facilities in the plan of improvement.

My major comments on the report concern, first, the economic justification of the individual units of the over-all plan, which are reported upon separately, particularly the participating projects; and, second, the unrestricted subsidization of irrigation projects by power revenues.

With respect to the economic justification of the individual units, there is no information in the report which would enable a check on the evaluation of benefits from the irrigation projects. A study of the individual reports on the participating projects which you have furnished appears to reveal questionable methods of economic analysis of secondary benefits. Although the benefit-cost ratios of these participating projects are shown to be in excess of unity, data to support these ratios are missing both from the main report and from the individual project reports. However, the principles stated to be the basis for computation of benefits are not believed to represent an accurate approach to such analyses. The inclusion of relatively large secondary benefits based
on the theory that the handling and processing of agricultural goods and the increase in associated goods and services are a benefit to the irrigation project to the extent reflected in your analysis is not concurred in. It may also be stated that the same theory of secondary benefits applied to power production, which you use, is considered unrealistic. For example, after determining that the direct power benefit from the storage project based on the sale of energy amounts to $35,359,000 a year, the report goes on to estimate that an additional $23,725,000 secondary power benefits (amounting to 67 percent of the direct benefit) would result from the following elements:

a. A saving in production cost realized by utilities purchasing project power for resale.

b. A proportionate share of the retailing benefits arising from resale of project power to the consumer at higher rates.

c. A proportionate share in the increased value of goods and services produced by utilization of project power.

Although substantiating data have not been made available for a definitive analysis of the benefits from the over-all plan and from the individual units, it is my opinion that these benefits are unrealistically high. The effect of reanalyzing the project and its component parts on the benefit-cost ratios cannot be determined with the information available.

My second concern is with the extent of subsidization of irrigation projects from power revenues, an integral part of the so-called "basin account." Although there are undoubtedly instances in which it would be to the national advantage to assist in the development of irrigation projects, the general formula embodied in the basin account proposed in your report would permit subsidization of any irrigation projects which come within the qualifications set up in your recommendations for the evaluation of participating projects. An examination of these requirements indicates that the minimum requirement with respect to reimbursement contemplates payment on the part of the irrigators of only the operation, maintenance, and replacement cost allocated to irrigation plus a part of the construction cost allocated to irrigation. Since the part of the construction cost is not defined, it would appear that there would be no restriction toward development of a project in which the undefined part of the repayment of the construction cost by the irrigators could be so small as to be negligible. This range of subsidy appears too wide to provide a proper safeguard for the interests of the United States. It should also be pointed out in this connection that the qualification with respect to economic justification of participating projects may not have the force intended, since, as pointed out
in a previous paragraph, the basic principle upon which the economic analyses in your report are predicated should in my opinion be subjected to further study.

In addition to the two basic issues discussed previously, I have certain general and specific comments to make.

The report is actually a preliminary treatment of a plan to provide regulatory storage capacity and power production facilities for the upper Colorado River Basin without full development of sufficient fundamental data for the comprehensive planning of such a system. There are unresolved questions of water rights, the allocation of water, and the optimum future development of the upper basin which would appear to make it impracticable to develop a plan of this magnitude at this time which would not be subject to future modification of such a large nature that the fundamental purpose of preparing a comprehensive plan would be defeated. For example, the question of providing storage for the treaty allocation to Mexico of 1,500,000 acre-feet per year is not covered by the report in a sufficiently firm manner to indicate the effect on the storage proposed. Although I am fully in sympathy with the objective of long-range planning and I realize the necessity of such planning in the development of our water resources, I believe that authorization of such plans should be sought only after the basic elements have become reasonably firm. When major questions remain unresolved, premature authorization may actually hamper and restrict future planning.

It is estimated in the report that full utilization of the water apportioned to the upper basin will not be realized for an estimated 75 years. At that time, the storage project will be operated primarily to supply the lower basin with its apportioned amount. In other words, it would appear that full utilization of the storage project potentialities, in so far as river regulation is concerned, would not be required for 75 years and, therefore, that the primary purpose of the project during its earlier life would be to provide power revenues to subsidize irrigation. Construction of ten participating projects would not affect this conclusion, since the stream depletion caused by these projects would only be approximately 400,000 acre-feet a year, which is only a fraction of the surplus now available.

With respect to the estimated value of power used in justification of the project, it appears that in addition to the questions raised previously with regard to the assumed large secondary benefits there may also be a question with regard to the direct benefits based upon the value used of 5.5 mills per kilowatt-hour. According to the report,
this value was based on the cost of producing energy at steam electric coal-burning plants at the principal load centers in each division of the project market area. However, as set forth in the report, the project market area will be, for a time at least, in the lower Colorado River Basin and in southern California. The report does not clearly show that the rate of 5.5 mills per kilowatt-hour would yield a sufficient return to the project to warrant construction of the necessary transmission facilities to the lower Colorado River Basin and southern California or that a market would exist for the quantity of power estimated for sale in that area at the rate of 5.5 mills per kilowatt-hour.

In view of the foregoing discussion, it appears that your report on the upper Colorado River storage project and participating projects is insufficiently advanced to permit satisfactory comments to be made on the engineering and economic justification of the plan at this time. Substantiating data are not available to permit reaching conclusions with respect to the justification of the project units or the project as a whole at this time. In addition, some of the basic premises and assumptions used in the economic analysis appear to be questionable, and the effect of modification of these premises may be of major importance in the computation of the benefit-cost ratio. The questions of policy brought up by your report regarding subsidization of irrigation projects which cannot be paid for by irrigators under existing reclamation law is a matter which should require the most careful consideration because of its far-reaching implications in the field of Federal public works. In conclusion, therefore, I am unable to concur in the recommendations in your report at this time with respect to the approval of the over-all plan and the immediate authorization of the initial phase proposed.

The opportunity to review your report and your courtesy in furnishing copies of the individual reports on the participating projects are appreciated.

Sincerely yours,

LEWIS A. PICK
Major General
Chief of Engineers