To the Editor:

The enclosed press release, maps, and physical data on the potential Colorado River Storage Project and Participating Projects may prove valuable as source material in future reporting of the Upper Colorado River Basin development.

Although the project report has been approved by the Secretary of the Interior there will not be enough copies for general distribution until and if the report is printed as a Senate Document. The accompanying fact sheets should give you sufficient data, however, until reports are available upon request.

As you know the report is now being reviewed by federal agencies and the governors of the basin states. Under the Flood Control Act of 1944, they have approximately until May 1, 1951, to submit their comments to the Secretary of the Interior for subsequent submission with the report to the President and the Congress.

E. O. Larson
Regional Director
A plan for development of the water and power resources of the Upper Colorado River Basin, which drains portions of five Rocky Mountain States, has been approved by Secretary of the Interior Oscar L. Chapman and sent to the Colorado River Basin States (Utah, Colorado, Wyoming, New Mexico, Arizona, Nevada, and California) for comment. The plan is in the form of a Bureau of Reclamation Planning Report entitled "The Colorado River Storage Project and Participating Projects, Upper Colorado River Basin."

The Report, which also goes to other Federal Agencies for review and comment, envisions the eventual construction by the Bureau of Reclamation of 10 dams and reservoirs with storage capacity of 48.5 million acre-feet of water and 1,622,000 kilowatts of hydroelectric capacity and numerous participating irrigation projects. Only five of the 10 dams are recommended for authorization at the present time. More than two million acres of irrigable land would eventually be benefited. Total cost of the Storage Project, the bulk of which would be repaid from power revenues, is estimated at $1,139,000,000. The Departmental Report was sponsored by the Bureau of Reclamation under the direction of Commissioner Michael W. Straus with the assistance and cooperation of other departmental agencies.

"The comprehensive plan for the Upper Colorado River Basin provides a blueprint for one of the few remaining great basin areas of the West which are not already well on the way to full use of their water resources", Secretary Chapman said. "The 48.5 million acre-feet of storage space provided
for in the plan compares with present available reservoir storage of less than two million acre-feet. The hydroelectric capacity of 1,622,000 kilowatts compares with less than 125,000 kilowatts of existing capacity in the Upper Basin, including internal combustion and stream plants as well as hydroelectric plants.

"Now that the Upper Basin Compact which apportions the available water among the states, is in force, urgently needed irrigation projects may be undertaken to turn dry land into productive farms and to supplement the meager water supply on several hundred thousand acres of presently irrigated land. An urgent need also exists for the hydroelectric power made possible by the storage reservoirs to permit utilization of the Upper Basin's natural resources including timber and vast deposits of coal, petroleum, oil shale, phosphate and other minerals."

Secretary Chapman added that virtually all costs of the project would be paid from the sale of power from hydroelectric plants in the Upper Basin above Lee Ferry, Arizona, the dividing line between the Upper and Lower Basin. The Blue Mesa Dam on the Gunnison River in Colorado is at the highest proposed elevation of any of the Upper Basin structures, with the crest elevation at 7,635 feet, almost a mile and a half above sea level. Foundation of the lowest dam, Glen Canyon, just above Lee Ferry, Arizona, is 3,015 feet. The proposed 10 dams would have a total height of 4,676 feet, well over four-fifths of a mile high, or eight times the height of the Washington monument.

The Colorado River drains or is contiguous to 7 states, all of which have limited precipitation (most of which falls in the winter) and long dry summers which make irrigation and conservation of available water resources a necessity for economic survival growth.
The Colorado River Compact of 1922 apportioned the waters of the Colorado River between the Upper and Lower Basins with Lee Ferry, Arizona, as the dividing point. The Upper Colorado River Compact of 1948, which was approved by the Eighty-First Congress, apportions the waters of the Upper Basin among the states of the basin and clears the way for upstream development.

"The states of the Upper Basin," Acting Commissioner of Reclamation Godrich W. Lineweaver said, "can realize the use of their apportioned water only when extensive river regulation is provided to assist them in meeting the downstream delivery of 75,000,000 acre-feet in a 10-year period as provided by the Colorado River Compact. This regulation can only be obtained by means of large reservoirs holding over great quantities of water from years of high runoff to years of low runoff. Judging from past records, these cycles might be as long as 20 to 25 years. Therefore these reservoirs must be ready to store water many years ahead of the actual time of need for irrigation purposes.

"In view of the existing national emergency, consideration should also be given to the suitability of the power features of the storage project as they relate to the national defense."

For these reasons, Lineweaver added, the Bureau of Reclamation recommended to Secretary Chapman in the report that five of the storage dams and 11 associated irrigation projects be proposed for initial authorization. The five storage projects are Echo Park and Flaming Gorge on the Green River, Glen Canyon on the Colorado, Navajo on the San Juan and Whitewater on the Gunnison. These five dams and reservoirs would provide 38,480,000 acre-feet of storage capacity and 1,150,000 kilowatts of hydroelectric generating capacity.
The initial participating irrigation projects would be the Emery County and the first phase of the Central Utah project, Utah; Florida, Silt and Smith Fork in Colorado; the Pine River extension in Colorado and New Mexico; Hammond, New Mexico, and LaBarge, Lyman and Seedskadee in Wyoming. In addition, the report proposes that the already authorized Eden, Wyoming and Paonia, Colorado, projects be included in the plan of development.

The report also proposes that the Shiprock Indian Reclamation project on the San Juan River in New Mexico be authorized for construction and that it receive assistance for the Upper Colorado River Account in the same manner and to the extent as other participating projects.

Other possible storage dams and reservoirs which would be left for future authorization include the Cross Mountain, on the Yampa River, the Gray Canyon on the Green River and Split Mountain on the Green River. Physical details of each of the 10 dams, reservoirs and hydroelectric plants and the participating projects are contained in an appendix to this announcement.

The power program contemplates an estimated annual firm energy generation when all 10 hydroelectric plants are installed of approximately 9 billion kilowatt hours. Energy produced in the first 70 years of project operations would be equal to that produced by burning either 225 million tons of coal, 856 million barrels of oil or 5.6 trillion cubic feet of natural gas.

The report proposes that firm energy be sold at an average rate of 5.5 mills a kilowatt hour and energy produced in advance of firm market needs be sold at 3 mills per kilowatt hour. A transmission grid would interconnect all plants to permit integrated operation of the project power plants and other power systems.
The storage project is economically justified by a benefit to cost ratio of 1.8 to 1. Net revenue from the storage project will repay all reimbursable costs of the storage project within 50 years after completion and will aid in the return of irrigation costs by the establishment of an Upper Colorado River Basin account. Estimates indicate that credits to this account would exceed charges by more than $600 million in the first 70 years of operation.

Sediment control was a major factor in the planning of the Colorado River Storage Project and it was definitely determined that silt would not hinder the payout capacity of the projects. A total capacity of 20,000,000 acre-feet would be provided in the reservoirs to accommodate sediment which would be deposited in the next 200 years according to present rates. More than three-fourths of the sediment will enter the river below all potential reservoirs except Glen Canyon and the bulk of the sediment storage space has been reserved in that reservoir. Although all planning was predicated on present rate of sedimentation, it was pointed out that improved land management practices would extend the period of protection against sediment encroachment considerably. Even after the space allocated to sediment has been filled, the dams and reservoirs would still have a useful life of several hundred years.

A special fund would be financed out of power revenue for further studies and investigations relating to the development, conservation and utilization of the waters of the Upper Colorado River Basin.

Further investigations are also recommended for the development of associated benefits from the river program by other agencies within the Department of the Interior. These include the Fish and Wildlife Service,
National Park Service, Bureau of Land Management, Bureau of Mines and Bureau of Indian Affairs.

The director of the National Park Service has advised that the recreational planning and construction program and the archeological, wildlife and geological programs, incident to the construction of dams and reservoirs in Dinosaur National Monument, are estimated to cost $18,354,000.

The report and the substantiating materials are presentations of all agencies in the Department of the Interior, assembled under the sponsorship of the Bureau of Reclamation. Important contributions were made by the Upper Colorado River Compact commission and states of the Upper Colorado River Basin as well as the Federal Power Commission and other federal agencies. A statutory time of 90 days is provided for the review and comments of the states and other federal agencies.
PHYSICAL DATA ON STORAGE UNITS AND PARTICIPATING PROJECTS RECOMMENDED IN THE PLAN FOR UPPER COLORADO RIVER BASIN

The report on the Colorado River Storage Project and associated participating projects lists 10 dams, reservoirs, and hydroelectric plants which are proposed for eventual construction to provide 48.5 million acre-feet of storage space and with installed hydroelectric capacity of 1,622,000 kilowatts.

The report, which was prepared by the Bureau of Reclamation, was approved January 31, 1951, by Secretary of the Interior Oscar L. Chapman and forwarded to the Colorado River Basin states and to interested Federal agencies for comment.

Five of these units are recommended for authorization of which three would be started as soon as possible and the remaining two at a later date. Physical data on the proposed storage units follows:

**Recommended for authorization and early construction**

1. **Echo Park Dam** to be located on the Green River about three miles east of the Utah-Colorado state line and three miles downstream from the confluence of the Green and Yampa Rivers in the tri-corner area of Wyoming, Colorado, and Utah. It would be a concrete, curved, gravity type structure rising 690 feet from bedrock. Hoover Dam, the world's highest, is 726 feet high. The reservoir would have storage capacity of 6,460,000 acre-feet including 5,460,000 acre-feet of live storage. When filled to capacity, the reservoir would have a surface area of 43,000 acres and would extend 63 miles up the Green River and 44 miles up the Yampa. The power plant, located at
the toe of the dam, would consist of four 50,000-kilowatt units or a total capacity of 200,000 kilowatts. The plant would have a mean operating head of about 475 feet. Construction cost is estimated at $165,400,000.

**Glen Canyon Dam** to be located on the Colorado River in northern Arizona about 13 miles downstream from the Utah-Arizona state line and 15 miles upstream from Lee Ferry, the dividing point between the upper and lower basins. The dam would be a concrete, curved, gravity type structure rising 700 feet from bedrock. The reservoir, which would be the final regulating storage point for deliveries to fulfill lower basin commitments under the compact, would have capacity of 26,000,000 acre-feet including 20,000,000 acre-feet of active capacity. The reservoir, when filled, would have a maximum water surface of 153,000 acres and would extend about 186 river miles up the Colorado, nearly to the mouth of the Green River, and 71 river miles up the San Juan. The reservoir would be the principal sediment repository in the upper basin. In 200 years, at present rate of sediment flow in the river, silt deposits would fill all inactive storage space and reduce the active storage space by half. The power plant would be located near the toe of the dam and would consist of seven generating units with a total installed capacity of 800,000 kilowatts. The plant would have a mean power head of 480 feet. Total cost is estimated at $363,900,000.

**Whitewater Dam** would be located on the Gunnison River 9½ miles southeast of Grand Junction, Colorado. It would be 15 miles upstream from the confluence of the Gunnison and Colorado Rivers. The dam would be an earth-fill embankment rising 335 feet above bedrock. Three dikes would be necessary in low saddles on the north side of Kannah Creek, four miles upstream from the dam. The reservoir would have a capacity of 850,000
acre-feet including an active capacity of 470,000 acre-feet. When filled to capacity, the reservoir would have a water surface of 10,250 acres and would extend about 35 miles upstream to a point four miles west of Delta, Colorado. The power plant, at the toe of the dam would consist of three generators with a total installed capacity of 48,000 kilowatts. The plant would have a mean power head of 220 feet. Total cost is estimated at $40,000,000.

**Recommended for authorization and later construction**

**Navajo Dam Site** is on the San Juan River in northwestern New Mexico, about 19.5 river miles upstream from Blanco and 34 miles east of Farmington, New Mexico. It is 3.5 miles downstream from the confluence of the Pine and San Juan Rivers. The dam would be an earth-fill structure 360 feet high and the reservoir would have a total capacity of 1,200,000 including an active capacity of 1,050,000 acre-feet. When filled to capacity, the reservoir would have a water surface of 10,800 acres and would extend 33 miles up the San Juan River to 3.5 miles beyond the town of Arboles, Colorado. The power plant would have three units with combined installed capacity of 30,000 kilowatts and operate under a mean head of 275 feet. Total cost is estimated at $63,000,000.

**Flaming Gorge unit** includes the Ashley Dam which would be located on the Green River 32 air miles north of Vernal, Utah, and the same distance downstream from the Utah-Wyoming border. Ashley Dam would be a concrete, gravity, type structure rising 491 feet from bedrock. Flaming Gorge reservoir, created by the dam, would have total storage capacity of 3,940,000 acre-feet including active capacity of 2,950,000 acre-feet. When filled, the reservoir would have a water surface area of 40,800 acres and would extend 91 miles upstream, to within 3 or 4 miles of the town of Green River, Wyoming. The
power plant would consist of three units with a total installed capacity of 72,000 kilowatts operating under a mean head of 395 feet. Estimated cost of construction is $382,700,000.

Storage Units Recommended for later authorization

Cross Mountain Dam would be located on the Yampa River four miles north of the settlement of Cross Mountain and about 50 miles west of Craig, Colorado. The dam would be a concrete, gravity structure rising 355 feet from bedrock. The reservoir would have 5,200,000 acre-feet of storage capacity including 4,200,000 acre-feet of active storage. When filled, the reservoir would have a surface area of 52,200 acres and extend upstream about 75 river miles, nearly to the town of Craig. The power plant would be located about three miles downstream from the dam with the water conducted from reservoir to power plant through a tunnel cut through rock on the south side of the river. The tunnel would be 17.5 feet in diameter and 11,700 feet in length. Two generators would give the plant a 60,000 kilowatt installed capacity and it would operate under a mean head of 400 feet. About 150 feet of this head would be obtained by placing the power plant downstream. Estimated construction cost of $51,000,000.

Curecanti unit would include Blue Mesa Dam on the Gunnison River about 3 1/2 miles downstream from Sapinero, Colorado. The dam would be a concrete gravity structure rising 510 feet from bedrock. The Curecanti Reservoir would have a capacity of 2,500,000 acre-feet including 2,010,000 of active storage. When filled to capacity, the reservoir would cover 18,200 acres and extend about 30 river miles upstream to within a mile of Gunnison, Colorado. The power plant at the toe of the dam would consist of three generating units with a total installed generating capacity of 54,000 kilowatts, operating under a mean head of 425 feet. Estimated construction cost is $80,400,000.
Crystal Dam would be located on the Gunnison River about 14 miles east of Montrose, Colorado, and only a short distance downstream from Blue Mesa Dam of the Curecanti unit. It would be a concrete gravity type structure 355 feet high from bedrock but creating only a comparatively small storage reservoir of 40,000 acre-feet capacity. Crystal reservoir would be essentially a re-regulating reservoir for the Curecanti Unit, taking advantage of the sharp drop in the Gunnison River and permitting irregular releases of water from Curecanti reservoir. The power plant at the toe of the dam would include three generating units with a total capacity of 48,000 kilowatts, operating under a constant head of 300 feet. Estimated construction cost is $37,900,000.

Gray Canyon Dam would be located on the Green River in Utah about 22 miles upstream from Green River, Utah. The site, formerly known as the Rattlesnake site, is about four miles upstream from the mouth of the Price River and immediately downstream from the mouth of Rattlesnake Creek. The dam would be a concrete, gravity type structure rising 575 feet from bedrock. The reservoir would have a capacity of 2,000,000 acre-feet including active capacity of 1,393,000/feet. When filled, the reservoir would have a water surface of 10,750 acres and would extend about 53 miles up the Green River. The narrow canyon through which the Green River flows at this point would confine the reservoir to a maximum width of about half a mile. The power plant would be located at the toe of the dam and would consist of four units with a total installed capacity of 210,000 kilowatts. It would operate under a mean head of 400 feet. Cost of construction is estimated at $178,400,000.

Split Mountain Dam would be located on the Green River 21 river miles below the potential Echo Park dam and near the lower end of Split Mountain canyon. The dam would be a concrete, gravity type structure rising 305 feet
from foundation. The reservoir would have a total capacity of 335,000 acre-feet all of which would serve solely to provide a head for the power plant and regulation of releases from the Echo Park unit. The plant would have 10,000 kilowatts capacity. The reservoir would extend upstream nearly 21 miles to the base tailrace at the Echo Park Dam and it would be operated in conjunction with that power plant. The reservoir would cover only 4,250 acres, being confined largely within the narrow walls of Split Mountain Canyon where the Green River pours through a narrow gap in the mountains. Estimated construction cost is $76,400,000.

**Participating Projects**

Of the several score of potential irrigation projects using Upper Colorado River system water, 11 are recommended for authorization, one for re-authorization, and provision is made for one additional project which is already authorized to be included under the proposed Basin Account. Physical data on the participating projects follows:

**Authorized Project**

**Eden Project, Wyoming**—The Big Sandy Dam, the principal feature of the Eden Project is under construction on Big Sandy Creek, 35 miles north of Rock Springs, Wyoming to impound 40,000 acre-feet of water. The reservoir will provide a supplemental water supply for 9,000 acres of land now irrigated and a full irrigation supply for 11,000 acres of arable dry land. The Means Canal will be constructed to convey reservoir water to the existing Eden Canal and lateral system which will be enlarged and extended.

Construction of the Eden Project, approved by the President September 18, 1940, was stopped by order of the War Production Board in December 1942. Completion was authorized by the Act of June 26, 1949, (Public Law 132, Eighty-first Congress, First Session) and construction is now under way.
The authorizing act provides "That of the construction costs of the irrigation features of the project not less than $1,500,000 for the project of twenty thousand irrigable acres, or a proportionate part thereof based on the actual irrigable acres..., shall be reimbursable by the water users in not to exceed sixty years..."

Re-authorization recommended

Paonia Project, Colorado. The Paonia Project provides for construction of a dam at Spring Creek "B" site on Muddy Creek, a tributary of the North Fork of the Gunnison River. The dam will form a reservoir of 18,000 acre-foot capacity in west-central Colorado near Paonia. The reservoir will provide supplemental water for 14,830 acres now irrigated with only a partial water supply and a full supply for 2,210 acres not heretofore irrigated. Work is nearing completion on the enlargement and extension of the Fire Mountain Canal which will distribute project water. Land served from the extension will include land now irrigated from Minnesota Creek and land on Rogers Mesa now irrigated from Leroux Creek. Leroux Creek water will then be diverted higher upstream and used for irrigation on Redlands Mesa.

Projects Recommended for Authorization

Central Utah Project, Utah.—The comprehensive Central Utah Project, a large multiple-purpose development, is of such magnitude that it has been planned in two parts—the initial phase, a unified portion that could operate independently, and the ultimate phase. Only the initial phase is included in the group recommended for initial participation in the Upper Colorado River Account.

The initial phase would intercept the flow of streams on the south slope of the Uinta Mountains as far east as Rock Creek and would convey the
water westward by gravity flow for use in the Bonneville Basin. Water for replacement and expanded irrigation in the Uinta Basin would be provided by storage on local streams. Several regulatory reservoirs would be required in both the Bonneville and Uinta Basins, the principal one being the enlarged Strawberry Reservoir on the Strawberry River. By construction of Soldier Creek Dam the capacity of the existing reservoir would be increased from 283,000 acre-feet to 1,370,000 acre-feet. The initial phase would provide for the irrigation of 29,600 acres of new land and 165,800 acres now irrigated but in need of more water or improved water regulation. It would also provide 48,800 acre-feet of water annually for municipal, industrial, and related uses. It would generate each year approximately 359,100,000 kilowatt-hours of firm energy and 3,400,000 kilowatt-hours of secondary energy.

**Emery County Project, Utah.**—Irrigation water would be furnished to 24,080 acres of land under existing canals diverting water from Cottonwood Creek and Huntington Creek in east-central Utah near Castle Dale. Supplemental water would be provided for 20,450 acres of the land and a full new supply would be provided for 3,630 acres. The irrigation water would be made available through storage of surplus spring run-off at a 57,000 acre-foot reservoir at the Joes Valley site on Cottonwood Creek. Water for lands in the Huntington Creek area would be conveyed by canal from Cottonwood Creek.

**Florida Project, Colorado.**—Lemon Reservoir, with a capacity of 23,300 acre-feet, would be formed by the Lemon Dam on the Florida River in Southwestern Colorado, southeast of Durango. This reservoir would regulate the Florida River run-off to provide an irrigation water supply for 18,950 acres, including 12,650 acres now irrigated with only a partial supply and 6,300 acres not now irrigated. Approximately 1,000 acres of the land in the
project area are Indian owned. The regulatory storage provided for irrigation would reduce floods which nearly every year cause extensive damage along the river course.

Hammond Project, New Mexico.—The Hammond project would divert natural flow of the San Juan River to provide an irrigation supply for 3,670 acres of presently unirrigated land along the south side of the river near Bloomfield, New Mexico. The water would be diverted from the river by a low diversion dam and conveyed to the project land by a gravity canal. A pumping unit would be installed to lift water 49 feet from the gravity canal to two highline laterals that would serve about 1,110 acres of the project land.

LaBarge Project, Wyoming.—Unregulated natural flow of the Green River would be diverted for the irrigation of 7,970 acres of land located west of the river between Big Piney and LaBarge in southwestern Wyoming. Only 300 acres of the land are cultivated and partially irrigated at present. The principal construction feature would be a canal 38 miles long, mostly of earth section.

Lyman Project, Wyoming.—Water would be stored in an offstream reservoir of 43,000 acre-foot capacity at the Bridger site on Willow Creek to furnish supplemental irrigation water for 40,600 acres of land along Black Fork near the town of Lyman in southwestern Wyoming. The reservoir would be fed by canals from Black Fork and West Fork of Smiths Fork.

Seedskadee Project, Wyoming.—This project would irrigate 60,720 acres of presently unsettled land located along both sides of the Green River in southwestern Wyoming, about 35 miles east of Kemmerer. The land would be irrigated by gravity diversions from the Green River. Two drops in distribution canals would drive turbines to lift water to higher land. No reservoir storage would be required.