REPORT

OF

POLICY AND REVIEW COMMITTEE
GUNNISON RIVER STORAGE

to the

COLORADO WATER CONSERVATION BOARD

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April 3, 1952

Approved by Colorado Water
Conservation Board
May 5, 1952
Clifford H. Stone, Director

REPORT OF POLICY AND REVIEW COMMITTEE
GUNNISON RIVER STORAGE

To

THE COLORADO WATER CONSERVATION BOARD

April 3, 1952

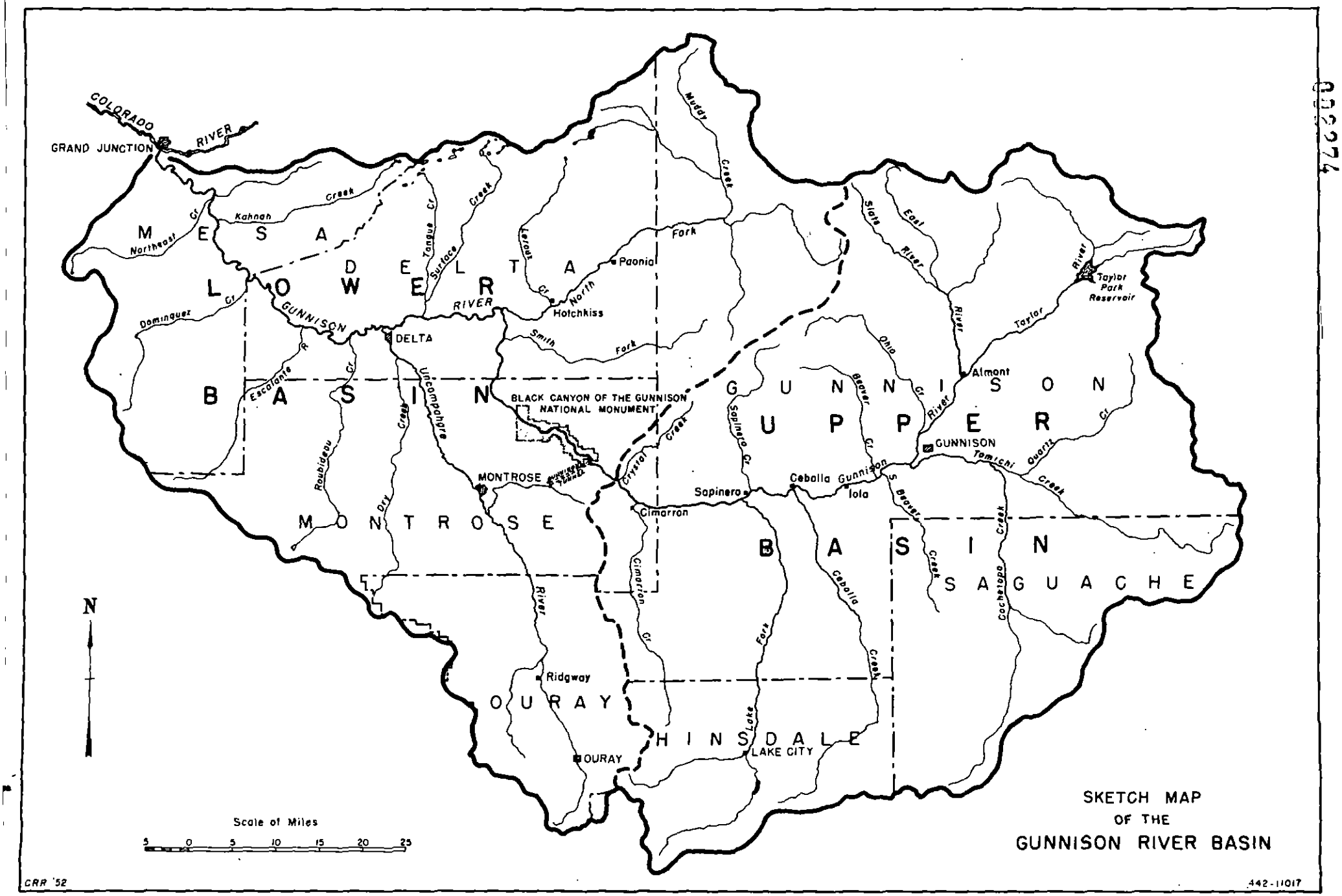
The Policy and Review Committee--Gunnison River Storage hereby submits its report and recommendations to the Colorado Water Conservation Board as follows:

I. Authority for Report. The Colorado Water Conservation Board, at a regular meeting, held on the 12th day of June, 1951, took the following action, namely:

> "Thereupon, it was moved by Judge Dan H. Hughes, and seconded by John W. Beaty, that the Colorado Water Conservation Board authorize the creation of a Policy and Review Committee to make further studies on, and consider policies in relation to, storage in the Gunnison River Basin and the location of storage units in that basin, as a part of the Colorado River Storage Project Plan, such committee to consist of one representative each from the counties of Gunnison, Montrose and Delta, one representative appointed by the Colorado River Conservation Board, the Director of the Colorado Game and Fish Commission, and the Director, Attorney, Consulting Engineer and Chief Engineer of the Colorado Water Conservation Board; and that such Committee is empowered to make such studies, perform the functions, as above mentioned, and prepare a report and recommendations for submission to the Colorado Water Conservation Board for final action in the matter."

Pursuant to this action, the personnel of the Policy and Review Committee was set up as follows: Ed L. Dutcher, representing Gunnison County; George Cory, representing Montrose County; F. M. Peterson, representing Delta County; Silmon Smith, representing the Colorado River Water Conservation District; Cleland N. Feast, Director of the Colorado Game and Fish Department; R. M. Gildersleeve, Chief Engineer, Royce J. Tipton, Consulting Engineer, Jean S. Breitenstein, Attorney, and Clifford H. Stone, Director, of the Colorado Water Conservation Board. Mr. Stone was made Chairman of the Committee.

II. Gunnison River Basin. The Gunnison River Basin is located at the base of the Continental Divide in west-central Colorado. It is one of the heaviest water-producing areas tributary to the Colorado River. Comprising only one-thirteenth of the tributary watershed, it yields more than one-seventh of the total runoff of the Colorado River at Lee Ferry. The area of the Basin is 8,020 square miles bounded on the east and southeast by the Sawatch and Cochetopa mountain ranges which form part of the Continental Divide chain. On the north the Basin is bounded by the Elk Mountains and the Grand Mesa.


COLORADO RIVER
GRAND JUNCTION
Kahnah Creek
Northeast Cr
Tongue Cr
Surface Creek
Muddy Creek
Leroux Cr
North Fork
Paonia
Hotchkiss
Dominguez Cr
GUNNISON RIVER
DELTA
Smith Fork
Escalante Cr
Uncompahgre Creek
Roubideau Creek
Dry Creek
BLACK CANYON OF THE GUNNISON NATIONAL MONUMENT
Crystal Creek
MONTROSE
Sapinero
Cimarron
Ridgway
OURAY
LAKE CITY
Slate River
East River
Taylor River
Taylor Park Reservoir
Ohio Creek
Beaver Cr
Almont
Sapinero Cr
GUNNISON
Tomichi Creek
Quartz Cr
Ceballa Gunnison
Iola
S Beaver Creek
Cimarron Cr
Cimarron River
Fork Creek
Cebolla Creek
Cochetopa Creek
Lake Fork
MESA
LOWER DELTA
BASIN
MONTROSE
UPPER GUNNISON
BASIN
SAGUACHE
OURAY
HINSDALE
N
Scale of Miles
5 0 5 10 15 20 25
SKETCH MAP
OF THE
GUNNISON RIVER BASIN
CRR '52
442-11017

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The southwestern boundary is formed by the San Juan Mountains and the Uncompahgre Plateau. The western termination of the basin occurs in the Grand Valley where the Gunnison River joins the Colorado River.

Principal tributaries of the Gunnison River (noted for the purposes of this report) are the East River and the Taylor River which join about ten miles north of the City of Gunnison to form the Gunnison River; the Ohio Creek and Tomichi River which join the Gunnison River near the City of Gunnison; North Beaver Creek and South Beaver Creek which join the Gunnison about six miles west of the City of Gunnison; the Cebolla Creek which joins the Gunnison about nineteen miles west of the City of Gunnison; the Lake Fork River which joins the Gunnison at Sapinero about twenty-seven miles west of the City of Gunnison, the Cimarron Creek which joins the Gunnison about forty miles west of the City of Gunnison; and Crystal Creek which joins the Gunnison a short distance above the Gunnison National Monument and below the confluence of Cimarron Creek and the Gunnison River.

The region tributary to the Gunnison River, including the Cimarron Creek and Crystal Creek basins, lying above the Black Canyon of the Gunnison National Monument, is referred to in this report as the "Upper Gunnison River Basin"; and the basin area below this division point is referred to as "Lower Gunnison River Basin." This is a natural division formed by the mountain ranges separating the Upper Gunnison drainage from the drainage area of the Uncompahgre and North Fork Rivers.

There is attached hereto a sketch map of the Gunnison River Basin showing both the Upper and the Lower Basins and principal tributaries of the Gunnison River, which should be visualized in reviewing this report.

III. Policy and Review Committee Procedure. The Committee held its first meeting and organized on the 28th day of September, 1951; the second meeting was held on the 14th day of December, 1951; and the third and final meeting was held on February 20, 21, 22 and 23 and, after a recess, on March 3, 1952.

Before an agreement was reached by the Committee at its final session on March 3, the following motion was unanimously adopted:

> "That any agreement reached by the Committee respecting storage of water in the Upper Gunnison River Basin, as a part of the Colorado River Storage Project, is predicated upon the premise that there shall not be any material change in the location and capacity of the reservoir storage in the Upper Gunnison Basin, under the plan approved by the Committee, either by the State of Colorado, acting through the Colorado Water Conservation Board, the Bureau of Reclamation, or the Secretary of the Interior, without resubmittal to and favorable comments by, the affected local interests in the counties of Montrose, Delta and Gunnison and by the Colorado River Water Conservation District Board."

It was understood in the adoption of this motion that its provisions do not extend to engineering details and designs for construction to accomplish the storage approved by the Committee.

An agreement on the general substance and recommendations of a report to the Colorado Water Conservation Board was reached on March 3. It was understood that the Chairman of the Committee should prepare a preliminary draft of report for submission to, and review by, each member of the Committee before being put in final form. The report herewith submitted, accordingly, has been reviewed and is in the form as revised and agreed upon by all members of the Committee. It represents a unanimous report and recommendations.

At the first meeting of the Committee, George Cory and F. M. Peterson, representing Montrose and Delta Counties, respectively, presented an extensive study which had been prepared by them on behalf of Montrose and Delta Counties to show their appraisal of need, desirability from an economic point of view, benefits and detriments which would result from the construction of the proposed Curecanti Reservoir with a storage of 2,500,000 acre-feet of water in the Upper Gunnison Basin. It was evident that such a report, because of its nature involving extensive supporting data, required further study and analysis. The Committee, accordingly, asked Messrs. Cory and Peterson to make a digest of the report for transmittal to the members of the Committee. This was done and a copy of such digest is attached hereto as Appendix A.

During the third meeting of the Committee, the Cory-Peterson report was reviewed in detail by its authors and discussed by the Committee. This presentation by the representatives of Montrose and Delta Counties, because of its exhaustive nature and consideration of many physical and economic factors, was of real assistance to the Committee. It represented a desire to secure adequate consideration by the Committee of all phases of the problems involved which the Montrose and Delta County people believed supported the Curecanti storage proposed by the Bureau of Reclamation in its report.

In the review and appraisal of the Cory-Peterson report, it was necessary, before reaching final conclusions, to consider facts and figures urged by Ed L. Dutcher, representative of Gunnison County, and which had been presented to the Colorado Water Conservation Board at its meeting of September 28, 1951, by those who appeared in behalf of the people of Gunnison County in opposition to the 2,500,000 acre-foot Curecanti Reservoir. These statements presented an appraisal of detriments to Gunnison County, where the water would be stored and valuable land inundated, and required careful consideration.

In like manner, the Committee considered a report prepared by the staff of the Colorado Water Conservation Board (heretofore presented to the Board) which covered:

1. The amount and classification of lands which would be inundated by the large Curecanti Reservoir.

2. An inventory of the livestock within the 2,500,000 acre-foot Reservoir Basin.

3. The amount of real estate within that reservoir basin and its value, as estimated by the owners.

4. An estimate of the amount of tax revenue which might be lost to Gunnison County and its taxing subdivisions, as a result of the inundation of lands and the removal of personal property.

Certain of the Gunnison County facts, data and information submitted in written form are attached hereto as Appendix B, and the report prepared by the staff of the Colorado Water Conservation Board is attached hereto as Appendix C. All of the statements made to the Board by the Gunnison Watershed Conservation Committee are not available in written form. They were heard by the Board at its meeting on June 11 and 12, 1951. However, all of the information submitted by the representatives of the Gunnison Watershed Conservation Committee to the Colorado Water Conservation Board on June 11 and 12, 1951 was considered as, and made a part of, the proceedings of the Committee. Accordingly, the Committee requests that the Colorado Water Conservation Board, in reviewing and acting upon this report, consider such facts, data and information as if made a part hereof by attachment of appropriate appendices.

At the first meeting of the Committee a statement was also presented by W. A. Groom, President of the Redlands Water and Power Company, supporting the need for storage in the Gunnison River Basin. A copy of this statement is attached hereto as Appendix D.

The Committee, at its first meeting, decided that certain additional studies for its information should be undertaken. Accordingly, Region 4 of the Bureau of Reclamation and the staff of the Colorado Water Conservation Board were asked to undertake studies to aid in answering the following five items:

1. Relative feasibility of placing a part or all of the proposed Curecanti storage at other sites in the Gunnison River Basin keeping total storage the same amount. This shall include such reservoir storage as may flood Black Canyon National Monument or a portion thereof. The studies which would pertain to storage which would flood the Monument shall be made by the Colorado Water Conservation Board.

2. Relative effect of decreased storage capacity in the Curecanti Reservoir on power production of Gunnison Basin units of the Colorado River Storage Project.

3. Amount of regulatory storage required at the Curecanti Reservoir site to facilitate full irrigation development in the Gunnison River Basin from its mouth to headwaters.

4. Amount and location of storage needed to provide water for potential industrial development in the Gunnison River Basin.

5. Effect on Colorado River Storage Project Plan if the proposed holdover storage capacity at the Curecanti site were reduced or eliminated.

C. B. Jacobson of Region 4, Bureau of Reclamation, agreed to undertake these studies, except for that part of Item 1 above specifically assigned to the Colorado Water Conservation Board staff.

At the second meeting of the Committee, R. M. Gildersleeve, Chief Engineer of the Colorado Water Conservation Board, presented the report on storage possibilities on the Gunnison River which might inundate a portion of the Gunnison (Black Canyon) National Monument. This report covered potential storage effectuated by a dam below the National Monument. A copy of this report is attached hereto as Appendix E.

C. B. Jacobson of Region 4, Bureau of Reclamation, presented a report on the other items covered by the Committee's request for studies made at its first meeting. This report is dated December 12, 1951 and presents Plans A, B and C, and is attached hereto as Appendix F. Plan A contained in the report is the same as the Colorado River Storage report of the Bureau of Reclamation.

During the discussion at the second meeting, there was presented to the Committee a list of potential reservoir sites in the Gunnison Basin compiled by the Water Board staff and the Grand Junction area office of the Bureau of Reclamation from Bureau reports and other sources, showing reservoir capacities, estimated dam and reservoir construction costs, based on 1949 prices, and unit costs per acre-foot of capacity. The list comprised 22 sites totaling 1,917,400 acre-feet, exclusive of the Curecanti Reservoir (2,500,000 acre-feet) and the Parlin site (2,550,000 acre-feet), and ranging in capacities from 1,000 acre-feet to 750,000 acre-feet, and in unit cost per acre-foot storage from $638 to $26. This list of reservoir sites is attached hereto as Appendix G.

It was agreed by the Committee at the second meeting that the storage provided in the Gunnison Basin must consider, among other things, the following in the interests of the State of Colorado:

1. Existing uses of water in the Gunnison Basin.

2. Water requirements, including storage, for projects, shown in the "Gunnison River Project Reconnaissance Report" of the Bureau of Reclamation.

3. Water required to provide supplemental water for presently irrigated land in the Gunnison River basin.

4. Water requirements for industrial purposes, particularly in connection with the processing of coal reserves for potential synthetic fuel production.

Following further discussion of ways and means of obtaining additional data, particularly with respect to other storage alternatives in the Gunnison Basin, it was concluded by the Committee at its second meeting that Region 4 be asked to furnish additional studies similar to the studies already made on the following combinations of gross storage:

Plan D --	Curecanti	330,000 acre-feet
	Taylor Park	Enlarge to a capacity within reasonable costs
	Crystal	510,000 acre-feet
	Gateview	308,000 acre-feet
	Whitewater	880,000 acre-feet
	TOTAL	*
Plan E --	Curecanti	940,000 acre-feet
	Whitewater	880,000 acre-feet
	Crystal	510,000 acre-feet
	TOTAL	*
Plan F --	Curecanti	330,000 acre-feet
	Whitewater	880,000 acre-feet
	Crystal	510,000 acre-feet
	TOTAL	*

*The remaining capacity required to bring the total of these combinations to a base comparable with the Bureau plan (total active capacity of 2,480,000 acre-feet) would be placed in the most favorable sites elsewhere in the Colorado River Basin in the State of Colorado.

Representatives of Region 4 agreed to undertake these studies for the information of the Committee.

Prior to the last meeting of the Committee, the Bureau made available to the Chairman of the Committee a copy of its proposed report, dated January 24, 1952, which had been requested by the Committee. This report was turned over to R. M. Gildersleeve, Chief Engineer, and Royce J. Tipton, Consulting Engineer of the Water Board, for review. Because of certain questions raised by this review, Mr. Jacobson came to Denver to discuss these matters with the engineers. Following the conference with Mr. Jacobson, further appraisal of Plan E was made by Mr. Gildersleeve and Mr. Tipton. The Bureau's January 24, 1952 report is attached hereto as Appendix H; and the Gildersleeve-Tipton appraisal of Plan E is attached hereto as Appendix I.

A summary of the work undertaken by the Committee at its last session (February 20, 21, 22, 23 and March 3) is:

1. About two days devoted to further presentation of the Cory-Peterson report, and appraisal of its contents through questions and discussion.

2. Consideration of facts and figures relating to similar subjects contained in the Cory-Peterson report, presented by the Gunnison County interests, and by the report, heretofore mentioned, prepared by the staff of the Colorado Water Conservation Board.

3. Presentation of effects on fish and wildlife from the storage of 2,500,000 acre-feet of water in the Curecanti Reservoir. This presentation was made by representatives of the Colorado Game and Fish Department, supplemented by statements of representatives of the Federal Fish and Wildlife Service. A summary of the presentation by the Colorado Game and Fish Commission is shown by Appendices J and K.

4. Presentation by C. B. Jacobson of Region 4, Bureau of Reclamation, on further studies relating to alternative storage possibilities in the Gunnison River Basin as requested by the Committee at its second meeting on December 14, 1951. (See Bureau letter of January 24, 1952, Appendix H mentioned above.)

5. Presentation of pertinent information and figures, prepared for inclusion in as yet unpublished reports, relating to quantities of water and storage thereof, required for the processing of coal reserves within the Gunnison Basin, as well as water and storage requirements for the processing of oil shale and coal reserves in the basin of the main stem of the Colorado River in Colorado.

6. Presentation by R. M. Gildersleeve, Chief Engineer of the Colorado Water Conservation Board, concerning Plan E (gross storage, Curecanti 940,000, Crystal 510,000 and Whitewater 880,000, or a total of 2,330,000 acre-feet gross storage in the Gunnison River Basin as part of the Colorado River Storage Project plan), as a substitute for Plan A presented in the Colorado River Storage Project by the Bureau of Reclamation.

7. Analysis, through discussion by members of the Committee, of the various studies, reports and materials which had been presented with a view of reaching final conclusions and recommendations for submission to the Colorado Water Conservation Board.

8. Consideration of protective measures to Montrose and Gunnison Counties submitted by the representative from Gunnison County.

9. Determination of final conclusions and agreement upon recommendations to the Colorado Water Conservation Board.

This agreement is accompanied by certain statements, placed in the record, by different members of the Committee. These statements are: By Silmon Smith, representative of the Colorado River Water Conservation District, Appendix L; by C. N. Feast, Director of the Colorado Game and Fish Department, Appendix M; by George Cory, representative of Montrose County, Appendix N; by F. M. Peterson, representative of Delta County, Appendix O; and by Ed L. Dutcher, representative of Gunnison County, Appendix P.

The Committee devoted two days of its third and last meeting, including the recess meeting on March 3, to a session which was open to interested Federal agencies, and three days to an executive session when only members

of the Committee were present, except that J. G. Will, Secretary-General Counsel of the Upper Colorado River Commission, was present at all sessions during the third and last meeting.

Representatives of Federal and other agencies who attended one or more meetings of the Committee, except executive sessions, are as follows:

Name	Address	Title	Meetings Attended
A. A. Batson	Denver	Director, Region 7 Bureau of Reclamation	1st
C. B. Jacobson	Salt Lake City	Engineer, Region 4 Bureau of Reclamation	1st-2nd-3rd
C. H. Jex	Grand Junction	Engineer, Region 4 Bureau of Reclamation	1st
L. E. Holmes	Salt Lake City	Region 4, Bureau of Reclamation	1st-2nd-3rd
Leon F. Maca	Denver	Hydrology Branch, Project Planning, Bureau of Reclamation	1st-2nd-3rd
R. A. Schmidt	Albuquerque	Fish & Wildlife Service	1st
A. B. Eustis	Denver	Fish & Wildlife Service	1st-2nd-3rd
R. W. Jennings	Grand Junction	Area Engineer, Region 4 Bureau of Reclamation	2nd
Richard D. Sias	Santa Fe	National Park Service	2nd-3rd
J. G. Will	Grand Junction	Secretary, Upper Colorado River Commission	2nd-3rd
J. R. Riter	Denver	Chief, Hydrology Branch, Project Planning, Bureau of Reclamation	3rd
Ben F. Powell	Pueblo	Area Engineer, Region 7 Bureau of Reclamation	3rd
H. R. Shepherd	Denver	Fish & Wildlife Service	3rd
Gilbert N. Hunter	Denver	Game Manager, Colorado Game and Fish Department	3rd
Wayne Seaman	Denver	Fish Technician, Colorado Game and Fish Department	3rd

The office of Region 4, Bureau of Reclamation, Salt Lake City, Utah, cooperated in a splendid manner in furnishing pertinent reports requested by the Committee. C. B. Jacobson, engineer of that office, rendered valuable aid to the Committee, not only in the preparation of reports but in appearing before the Committee and explaining and discussing them. The Committee expresses its appreciation of this cooperation and service.

Leon F. Maca, of the Hydrology Branch, Division of Project Planning, Bureau of Reclamation, served as Secretary of the Committee at its request. The Committee expresses appreciation for the splendid work Mr. Maca performed in attendance at meetings and in the preparation of Committee minutes.

Minutes of the meetings of the Committee are available in the office of the Colorado Water Conservation Board and may be inspected by any member of the Board who may wish to do so.

IV. Findings and Conclusions. On the basis of the studies and reviews made by the Committee, including consideration of studies made for the Committee at its request, and policy which, in the view of the Committee, should be applied, the following findings and conclusions are made by the Committee:

1. That general principles applicable to final solution of the problem of Gunnison River storage, as a part of the Colorado River Storage Plan, should comport with the following:

(a) Any storage in the Gunnison River Basin should be compatible with the requirements for the development of the entire Gunnison River Basin, including, but not limited to, the consumptive use of water for domestic and irrigation purposes (water for the irrigation of new lands as well as providing a dependable water supply for presently but inadequately irrigated land), water supplies for synthetic fuel production and other industrial uses, and, in connection therewith, the preservation of fish, wildlife and recreational values. The determination of such factors must be considered in relation to present and potential uses of water on the main stem of the Colorado River from Grand Lake to its confluence with the Gunnison River at Grand Junction, Colorado.

(b) Since storage of water in the Gunnison River Basin is proposed as part of the Colorado River Storage Plan to provide the necessary holdover storage to meet compact obligations of the Upper Division States under the Colorado River Compact of 1922, every effort should be made to secure the greatest total storage on the Gunnison River, where relatively low evaporation losses and relatively minor siltation problems are present, compatible with the best interests of Colorado and local affected areas in the utilization of the State's share of Colorado River water.

(c) The cost of storage facilities proposed for construction in the Gunnison River Basin, must comply with reasonable standards of financial feasibility in relation to, and as a part of, the Colorado River Storage Project plan.

(d) The objectives set forth in (a), (b) and (c) above should be attained without unnecessary and avoidable detriments and economic losses to areas which would be inundated by proposed reservoir storage. In the evaluation of Federal Reclamation project plans, consideration should be given to negative values, as well as to the benefits arising from such projects. Consistent with major project objectives, substantial losses to the existing economy of one area, where reservoir storage or other project features are located for the benefit of the larger or adjacent areas, should be avoided as far as possible.

(e) Desirable dam sites, such as that for the proposed Curecanti Reservoir, should not be exploited for relatively minor storage purposes, so as to foreclose their future use to accomplish needed storage in the area for the best interest of the State's water development program in relation to holdover storage requirements in the Upper Basin.

(f) The adoption of a storage plan for the Gunnison River Basin, as a part of the Colorado River Storage Project, should not be controlled solely by those factors which favor the best plan, from an engineering and economic point of view, for the entire Colorado River Storage Project. Due consideration should be given to economic factors and programs for water development which are directly related to and concern the State of Colorado and its affected local areas.

(g) It is in the interests of the State of Colorado in its future development and the utilization of its remaining water supplies, as well as in the interest of local areas directly affected, to avoid internal controversies and dissensions which would jeopardize the program of comprehensive development of the Upper Colorado River Basin and the ability of the State to collaborate with the other Upper Colorado River Basin States in furthering the program submitted by the Bureau of Reclamation's Colorado River Storage Project Report.

2. That the Engineering Advisory Committee to the Upper Colorado River Basin Compact Commission determined that the active storage capacity required to equate the stream flow above Lee Ferry would not exceed 30,000,000 acre-feet; that the Bureau of Reclamation, after making further studies on the subject, determined that the active storage required to equate the stream flow above Lee Ferry and to enable the Upper Basin to utilize 7,500,000 acre-feet of water a year would be approximately 23,000,000 acre-feet; and that a total capacity

in the Upper Basin of 48,555,000 acre-feet is required in the Colorado River Storage Project plan, including silt control, for the development of the Upper Basin and to meet compact obligations. The Bureau's figures on this 48,555,000 acre-feet capacity is given in its report as follows:

Active Storage	
Initial	37,530,000
Year 200	25,941,000

Inactive Storage	
Initial	11,025,000
Year 200	2,614,000

Active storage is required for stream flow regulation to meet compact obligations and the inactive capacity over a 200-year period will serve for silt control and to maintain the necessary head for the production of hydroelectric energy.

It is noted that at the end of 200 years, there will remain 25,941,000 acre-feet of active storage which exceeds by 2,941,000 the estimated 23,000,000 required to equate the stream flow and enable the Upper Basin to use its 7,500,000 acre-feet of water. A large active storage, in the initial phase, (estimated at 37,530,000 acre-feet) to maintain estimated hydroelectric power returns is required for economic project feasibility.

It is considered that the estimate for silt control, in the very nature of the problem, carried with it a considerable degree of speculation. Any reduction in capacity for silt control in the order of 1,000,000 acre-feet of the total Colorado River storage capacity by reduction in holdover capacity in the Gunnison River Basin would reduce the estimated useful life of the project for a relatively short period of time. Moreover, it may well be assumed that during the next 200 years, soil conservation and land treatment programs in the Upper Basin will have the effect of reducing the silt load.

It also appears that provision could be made to provide another million acre-feet of storage in other presently proposed units of the Colorado River Storage Project plan. The Bureau reported to the Committee:

> "Rather than establish new reservoirs for this purpose, consideration should be given to increasing the height of one or several of the proposed dams included in the Colorado River Storage Project on other tributaries since these dams or reservoirs are at the most attractive sites in the Upper Colorado River system." (See attached report of the Bureau of Reclamation of January 24, 1952.)

3. That the Upper Basin can only use between 4,500,000 and 5,000,000 acre-feet of water a year out of its allocated 7,500,000 acre-feet a year without the hold-over storage, above mentioned, required to enable the Upper Division States to meet compact obligations for delivery of water at Lee Ferry. Without such hold-over storage, Colorado's share of water allocated to the Upper Basin by the Upper Colorado River Basin Compact of 1949 would be reduced from between approximately 1,300,000 and 1,600,000 acre-feet of water a year. The remaining unused water in the State which may be relied upon for its future development must not be further limited and restricted by failure or inability arising from internal controversies, or otherwise, to join in a program which will make its full share of Colorado River water available to it. It is important, therefore, that in considering storage on the Gunnison River as a part of the Colorado River Storage Project plan that the broad aspects of future water development in the State be considered in connection with local and area factors.

4. That adequate storage in the Upper Gunnison River Basin is necessary for stream flow regulation in order to secure the full benefits from the storage in the proposed Whitewater Reservoir site. Accordingly, sufficient storage in the Upper Gunnison River Basin, through initial authorization and construction, should be provided in advance of the proposed Whitewater storage.

5. That it is estimated the storage requirements in the Upper Gunnison Basin for beneficial consumptive use of water for domestic, agricultural and industrial purposes will amount to approximately 425,000 acre-feet. This includes estimated storage of 95,000 acre-feet for synthetic fuel processing. This latter storage requirement is based on the results of studies and surveys, made available to the Committee, which have not yet been released to the public.

6. That, of the five alternative Gunnison River Storage plans, (Plans B to F inclusive), set forth in the report and study submitted by the Bureau of Reclamation in its report of January 24, 1952 to the Committee (attached hereto as Appendix H, mentioned above), the only plan which meets the policies and criteria approved by the Committee is Plan E.

Plan A, described as to total storage and active storage on Page 1 of the Bureau's report is the same set forth in the Colorado River Storage Project Report for the Gunnison River and is as follows:

		Total Storage	Active Storage
Plan A	(Same as the Colorado River Storage Project plan)		
	Curecanti	2,500,000 A.F.	2,010,000 A.F.
	Crystal	40,000 A.F.	0 A.F.
	Whitewater	880,000 A.F.	470,000 A.F.
		3,420,000 A.F.	2,480,000 A.F.

Plan E, set forth on Page 2 of the Bureau's report, so far as total storage and active storage is concerned is as follows:

Plan E	Curecanti	940,000 A.F.	765,000 A.F.
	Whitewater	880,000 A.F.	470,000 A.F.
	Crystal	510,000 A.F.	425,000 A.F.
		2,330,000 A.F.	1,660,000 A.F.

Concerning Plan E the Committee finds:

(a) It would reduce the total storage in the Gunnison River Basin, as compared with Plan A, by 1,090,000 acre-feet and the active storage by 820,000 acre-feet.

(b) It would provide 1,190,000 acre-feet of active storage, on which reliance could be made to take care of the 425,000 acre-feet of storage estimated by the Committee as being the necessary capacity to take care of consumptive use of water in the Gunnison River for domestic, agricultural and industrial purposes.

(c) It would reduce the inundation of land in Gunnison County, as compared with Plan A, from approximately 18,000 acres to 9,200 acres. Under this reduction in inundated area, the high water line would be at the upper end of the Narrows about seven miles west of Gunnison instead of at the city limits of Gunnison.

(d) It would reduce the 5,049 acres, estimated by the Bureau of Reclamation as the area of land classified as presently irrigated which would be inundated in Gunnison County by the 2,500,000 acre-foot Curecanti under Plan A, to approximately 2,000 acres. This would mean that only about 40 per cent of the presently irrigated land which would be inundated by the 2,500,000 acre-foot Curecanti storage would be inundated by the 940,000 acre-feet of Curecanti storage under Plan E. There would be approximately the same proportionate, perhaps greater, reduction in the adverse economic effects on the livestock economy in Gunnison County. The Committee is unable to confirm the correctness of the Bureau's estimate that approximately 5,049 acres of irrigated land would be inundated by the Curecanti Reservoir with 2,500,000 acre-feet of storage. Further surveys may show that this figure is somewhat greater, but the proportion of reduction in the inundation of presently irrigated land by the reduced storage, it may well be assumed, is substantially correct. The Bureau found 1,219 acres of land in the affected area under the larger reservoir which is under ditch but which has not been irrigated. The extent to which the smaller reservoir would relieve this 1,219 acres of land from inundation cannot be estimated by the Committee.

(e) It would reduce the loss in tax returns to Gunnison County and its tax collecting sub-divisions, exclusive of returns from railroad valuations, arising from proposed reservoir storage, in comparison with Plan A, at least 46 per cent. This reduction in tax returns is computed by the staff of the Colorado Water Conservation Board on the basis of the report prepared by such staff and submitted at the June 11 and 12, 1951 meeting of the Colorado Water Conservation Board. It is understood, of course, that there is a slight difference in the various computations which have been made and submitted to the Committee with respect to the tax loss, arising from inundation of land, which would be suffered by Gunnison County and its tax collecting sub-divisions in the event of 2,500,000 acre-feet being stored at the Curecanti site. In any event, the effect on tax returns to Gunnison County through reduction in storage at the Curecanti site to 940,000 acre-feet is reasonably well reflected by the percentage-wise figure set forth in this paragraph.

(f) It would increase the total storage capacity of the Crystal Reservoir from 40,000 acre-feet (as shown in Plan A) to 510,000 acre-feet, and the active storage capacity from 0 to 425,000 acre-feet.

(g) It would increase the initial salable hydroelectric energy from 839,000,000 kwh a year (as shown for Plan A) to 914,000,000 kwh a year, an increase of 75,000,000 kwh a year. The generating facilities would be located at the Curecanti, Crystal and Whitewater dam sites and would not require diversion of water by tunnel from the river course through the Black Canyon National Monument. It utilizes an available dam site and storage capacity in the Black Canyon area above the Monument for power production purposes without interference with other uses of water or encroachment in any way on the National Monument; and it makes available 425,000 acre feet of active capacity with only slight inundation of presently cultivated and irrigated land. Such inundation as would occur will be in the extreme lower section of the Cimarron River Basin, where both economic and tax return losses occasioned thereby will be very minor as compared with inundation of the meadow land lying immediately west of the City of Gunnison.

(h) It would increase the cost of storage units in the Gunnison River Basin over Plan A by $36,255,000, reducing the cost of the Curecanti from $81,870,000 to $54,200,000 and increasing the cost of Crystal from $38,650,000 to $102,575,000, all such costs including power installations and transmission facilities. The increased energy resulting from the change of plans is not sufficient to balance the increase in cost of Gunnison River Basin storage units. However, although the average annual initial power costs for the Gunnison River units will be increased approximately 0.7 mills per kwh above those calculated from the Colorado River Storage Project report, the average annual increase in initial power costs for the total energy generation of the entire Colorado River Storage

project will be about 0.1 mills per kwh. (See Gildersleeve-Tipton statement attached hereto as Appendix I.) This increased power cost may be absorbed by a slight increase in the rate at which the energy will be sold, or a corresponding minor reduction in the amount of the proposed development fund available for participating projects.

(i) It will save approximately seven miles of the Gunnison River west of Gunnison for stream fishing. It will reduce, in some degree, because of a lower high water level, adverse effects on the present winter habitat of deer and elk in the area. The extent of such favorable effects of the reduced Curecanti storage cannot be accurately determined at this time.

(j) It will not materially improve, because of the decrease in inundated area, dislocation of various fishing resorts now located west of Gunnison along the Gunnison River. These resorts, with one or two exceptions, are located west of the high water line of the reduced Curecanti storage (940,000 acre-feet).

(k) It will eliminate a recognized and well understood objection, made by the people of Gunnison County, to the undesirable fluctuation of the high-water levels immediately adjacent to the City of Gunnison. Although it has been shown by engineering studies that the principal lowering of the high-water line would in most years occur in the late fall and winter months, an unsightly mud-flat condition at any time of the year immediately adjacent to a county seat city of 2700 people, well known as a resort center, should be avoided if possible.

(l) It would be financially feasible, both as to the overall Colorado River Storage plan of the Bureau of Reclamation and as to the separate Gunnison River storage units of that plan. This is a most important consideration, and in support thereof see the Gildersleeve-Tipton study on this particular subject attached hereto as Appendix I.

7. That the section of the Gunnison River Basin between the Black Canyon National Monument and Delta does not provide substitute storage sites for any appreciable portion of the proposed Curecanti Reservoir. The Austin (sometimes called Nado) damsite, about three-fourths of a mile above the mouth of Smith Fork, is a good site, with a dam 300 feet high in the inner gorge, for the storage of approximately 110,000 acre-feet of water. Such a dam would back water into the Monument for a distance of about two miles. A dam 500 feet high at this site would store 460,000 acre-feet, backing the water more than three miles beyond the west boundary of the Monument, but is considered engineeringly and financially infeasible. Unsatisfactory foundation conditions on either side of the inner gorge, over which a higher dam would extend, and disproportionately high construction costs, as compared with other units in the Colorado

River Storage Project plan, clearly eliminate the storage of more than the 110,000 acre-feet of water at this Austin site. (See Appendix E hereinabove mentioned.)

8. That the total storage of 510,000 acre-feet of water in the Crystal Reservoir (proposed in Plan E), and increase of 470,000 acre-feet at this site over the capacity proposed under Plan A, will result in the inundation of only the extreme lower portion of the Cimarron Valley. Such inundation will include the settlement at Cimarron on Highway 50 and extend about four miles up the valley from Cimarron. No appreciable amount of presently cultivated or meadow land will be affected. The stock ranches in the Cimarron Valley, in both Montrose and Gunnison Counties, except for a negligible acreage, will lie above the high-water line of the Crystal Reservoir. George Cory, representative of Montrose County on the Committee, was responsible for making contacts with Cimarron Valley property owners whose lands and improvements would be flooded by the proposed Crystal storage of water. The attitude of these property owners was found to be very cooperative and is expressed in a report hereto attached as Appendix Q.

9. That the enlargement of the existing Taylor Park Reservoir, as a unit of the Gunnison River storage and as a part of the proposed Colorado River Storage Project, lacks financial feasibility. The increased storage capacity acquired by full control of the Taylor River flow, exclusive of any importation of water to the watershed above that reservoir, would be insignificant. Importation of water to provide an estimated 760,000 acre-foot capacity at this site, as has been suggested, would involve excessive and unsupportable cost. Possible sources for this imported supply of water are East and Slate Rivers, tributaries of the Gunnison River, Anthracite Creek, a tributary of the North Fork of the Gunnison, or Maroon Creek, Castle Creek and Crystal River, tributaries of the Roaring Fork River. Besides the excessive costs, diversion of any Roaring Fork Water, especially from the Crystal River, may well compete with other plans now under investigation in Western Colorado, for the use of the water of that stream. (See Bureau of Reclamation Report to Committee of January 24, 1952, Appendix H)

In order to make available increased use of water for present and potential development in the Upper Gunnison River Basin through storage of water in the existing Taylor Park Reservoir, and to avoid excessive fluctuations of stream flow detrimental to fishery, the use and operation of Taylor Park Reservoir for the above purposes should be integrated with that of the proposed Curecanti and Crystal Reservoirs. These objectives should be accomplished by appropriate arrangements with the Uncompahgre Water Users Association and the Government. Under such arrangements, it is understood that the water decrees of the Uncompahgre Water Users on the river would have to be preserved; and it is urged and recommended that, in making such arrangements with respect to such use and operation of Taylor Park Reservoir and the release of water therefrom, so as to preserve the above-mentioned

opportunities, the local interests in Gunnison County should be given a voice.

The Taylor Park Dam is equipped with a penstock for use in production of hydroelectric energy at that dam. In making any agreement, mentioned in the foregoing paragraph, consideration should be given to the hydroelectric potentiality in the integration of storage facilities in the Gunnison River Basin.

10. That the storage in the Upper Gunnison River Basin, as a part of the Colorado River Storage Project, should include, and be limited to, 940,000 acre feet of water in the Curecanti Reservoir and approximately 510,000 acre feet of water in the Crystal Reservoir, or a total of 1,450,000 acre feet; and that the Colorado River Storage plan, in addition to the above described 1,450,000 acre feet of total storage in the Upper Gunnison River Basin, should retain and include the proposed 880,000 acre feet of storage at the Whitewater site in the Lower Gunnison River Basin. Such storage in the Upper Gunnison River Basin should be included in the initial authorization for construction of project units of the Colorado River Storage Project. Construction of the Whitewater Unit should be delayed for later authorization, contrary to the recommendations of the Bureau of Reclamation that it be the initial unit authorized for construction in the Gunnison River Basin. The reason for such delay in authorization of the Whitewater Unit is heretofore set out in this report. The above described storage units in the Gunnison River Basin (Curecanti - 940,000 acre feet; Crystal - 510,000 acre-feet; and Whitewater - 880,000 acre-feet) constitute Plan E and will provide a total storage of 2,330,000 acre feet in that basin with an active storage capacity of 1,660,000 acre-feet.

Under this plan the proposed Whitewater Reservoir is an essential unit under Plan E, both to provide in the Gunnison River basin a more adequate contribution to the total Upper Colorado River Basin storage for stream flow regulation at Lee Ferry in the light of the reduction of the capacity originally proposed for Curecanti Reservoir. This reservoir in the final plan of development, as shown by the report of the Bureau of Reclamation, will provide water for both supplemental irrigation purposes and for new land. It is significant, too, that it may in the end aid materially the oil shale processing along the main stem of the Colorado River.

11. The tax revenue losses to Gunnison County and affected school districts, resulting from the inundation of land by the 2,500,000 acre-foot Curecanti Reservoir, would be from 2.99 per cent to 3.9 per cent of present collections. If the tax returns from the narrow-gage railroad line between Gunnison and Sapinero are included, such losses would be between 8.87 per cent and 10.4 per cent. Construction of the larger Curecanti Reservoir (2,500,000 acre-feet) or the smaller reservoirs under Plan E (940,000 acre-feet) would require the removal of this thirty-mile stretch of narrow-gage railroad. It is now a branch line, connecting at Gunnison with the narrow-gage line from Crested Butte, Colorado

to Salida, Colorado, but originally it was a part of the main railroad line from Gunnison to Montrose. No passenger service is operated on any part of this narrow-gage system. The Sapinero branch is used for unscheduled freight service, largely for livestock and timber haulage from Sapinero to Gunnison. This Sapinero branch line, sooner or later, may be abandoned, irrespective of reservoir storage in the area traversed by it, but the Committee has no way of determining when such abandonment might occur.

As shown elsewhere in this report, the reduction of storage in the proposed Curecanti Reservoir from 2,500,000 acre-feet to 940,000 acre-feet will result in an estimated reduction of the loss in tax returns to Gunnison County and its tax collecting subdivisions because of land inundation, in the amount of at least 46 per cent, exclusive of returns from railroad valuation.

12. That the storage of 2,500,000 acre-feet of water in the Curecanti Reservoir, as proposed in the report of the Bureau of Reclamation, will have an adverse effect on the present fishery and game resources in the inundated area. An appraisal of these effects is furnished by the Colorado Game and Fish Department, as shown by Appendices J and K, hereto attached. The storage of 940,000 acre-feet of water instead of 2,500,000 acre-feet in the proposed Curecanti Reservoir, as recommended in this report, will materially reduce this adverse effect. As a matter of fact, there is a wide difference of opinion as to whether there will be any adverse economic effects. It is contended by some that the recreational opportunities and economic returns made possible by large bodies of stored water in the area will more than offset the detriments from the inundation of the Gunnison River valley floor. So far as fishery is concerned, there is involved in this matter the sportsman's preference for stream or lake fishing; and there is also involved from an economic point of view the consideration of tourist attractions of rivers and lakes, with all of their attendant recreational advantages. With a 940,000 acre-foot Curecanti Reservoir and a 510,000 acre-foot Crystal Reservoir, only about sixteen miles of the 49 miles of fishing on the Gunnison River between Cimarron and Almont, where the confluence of Taylor and East Rivers form that river, will remain open for stream fishing, although there will also remain about 997 miles of fishery waters on the tributaries of the Gunnison River in Gunnison County. This reduction in fishery mileage, in some instances, offends State and local pride in a nationally famous fishing stream. The natural inertia against physical and economic changes inherent in development of natural resources is also encountered. Thus, the problem of weighing widespread public benefits, in programs of water development, against direct local detriment, whether real or merely feared, and against the ideology of sportsmen, becomes a difficult one.

Considering all of these factors, it appears clear, however, that the future welfare and economic advancement of Western Colorado, the State as a whole, and the Upper Colorado River basin

justify and make necessary, in the utilization of limited water resources, the storage of water in the Upper Gunnison basin under, and to the extent proposed in Plan E.

The conditions set forth in Appendix M should be accepted. They assure that the lands and waters included in the project, consistent with its primary purpose, shall be open to public hunting and fishing in accordance with the laws of the State of Colorado under the supervision of the Colorado Game and Fish Department; that access to facilities for game and fishin the affected area shall be maintained; and that the provisions of Public Law 732 shall be observed in the planning, construction and operation of the project.

13. That the storage of water in the Gunnison River Basin, as a part of the Colorado River Storage Project, should be approved, subject to three conditions, namely:

(a) U. S. Highway 50, because of reservoir inundation of its present right-of-way, without expense to either the State or counties, be relocated in such a manner that it will pass through and directly serve the cities of Gunnison and Montrose in accordance with plans approved by the Department of Highways, State of Colorado; and the necessary access and approach roads, which now connect with U. S. Highway 50 to serve communities and activities in the area, and which will be destroyed by reservoir inundation, be replaced and relocated without expense to the State or counties, so as to preserve such transportation facilities.

(b) The provisions of federal law (64 Stat.1100, approved September 30, 1950), respecting the impact on local school districts during the period of construction by the Bureau of Reclamation, be strictly observed. This is for the purpose of providing necessary funds for additional school facilities, as well as maintenance and operation thereof, occasioned by construction activities of the Federal Government.

(c) The utilization of project facilities for recreational, fish and wildlife purposes shall be in accordance with the following:

(1) That all lands and waters contained within the project shall be open to public hunting and fishing, consistent with the primary purposes of the project.

(2) That the public access to these lands and waters be maintained at all times.

(3) That the project be constructed and operated in accordance with Public Law 732, 79th Congress, 2nd Session (60 Stat. 1080).

14. That in order to minimize, as far as possible, any economic and tax return losses to the areas directly affected by the project construction recommended and approved by this report, appropriate action should be taken to attain the following protective measures and arrangements:

(a) The use of Taylor Park Reservoir and the integration of its operation with that of the proposed Curecanti and Crystal Reservoirs should be accomplished in the manner, and for the purposes, set forth in Paragraph 9 of Section IV - "Findings and Conclusions" of this report.

(b) That a committee be appointed by the Colorado Water Conservation Board, consisting of one representative from the Bureau of Reclamation, one representative of the Colorado Water Conservation Board, one representative of each of the Boards of County Commissioners of Gunnison, Montrose, Delta and Mesa Counties, to study and determine what losses in tax returns, if any, will be suffered by any of such counties, or their legal tax collecting subdivisions, occasioned by or arising from, the construction of storage facilities in the Gunnison River Basin, and to explore and recommend ways and means for recoupment of such tax losses.

(c) In the use of water in the Upper Gunnison River Basin, under Federal Reclamation Project development, the applications of the land limitation provisions of the Federal Reclamation laws be modified to correspond with economic, climatic, and agricultural conditions in the area.

(d) Owners of fishing resorts, homes and other property presently located along the Gunnison River in Gunnison County on land which will be inundated by reservoir storage, be given the preferential privilege to occupy suitable tracts on lands acquired by the government bordering, or adjacent to the proposed reservoirs, subject to observance of the conditions set forth in Paragraph 13 (c), (1), (2) and (3) of this report.

(e) Land owners dispossessed because of inundation by Gunnison River Storage be given a preference status to relocate on public lands in the Upper Gunnison River Basin under participating projects, Colorado River Storage Project, which may be constructed, subject to preference granted by federal law to war veterans.

(f) That the Bureau of Reclamation complete its studies, surveys and investigations of participating projects in the Gunnison River Basin, under the Colorado River Storage Project Plan, at as early a date as possible, in connection with detailed surveys for the Gunnison River Storage units.

(g) Ways and means be sought whereby livestock ranchers, dispossessed because of reservoir storage in the Upper Gunnison

River Basin, may retain their respective range rights on the National Forest or public domain, and be permitted to transfer such rights without any cut in livestock numbers due to such transfer to new units which may be acquired by them in the area.

(h) In the enforced acquisition of private property by the United States for Gunnison River Basin units of the Colorado River Storage Project plan, consideration be given by the government to protection against excessive increases in income taxes which may result.

15. That in June, 1951, the State of Colorado, acting through the Colorado Water Conservation Board, submitted to the Secretary of the Interior, pursuant to Section 1 of the 1944 Flood Control Act, its official State Comments on the report of the Bureau of Reclamation on the "Colorado River Storage Project and Participating Projects." These comments contained the following statement concerning storage units in the Gunnison River Basin as a part of the Colorado River Storage Project:

"Colorado believes that full study has not been given to these Gunnison River potentials. Many local problems are presented. Colorado most respectfully requests that it be given opportunity at a later date to state its position with regard to the Gunnison River storage. To this end, it requests that the Bridgeport unit should not be included within the initial list and that further study and consideration should be given to the location of storage units on the Gunnison River which develop, as far as possible under all of the conditions, the full power potential of that stream, permit the early construction of participating irrigation projects, and provide hold-over storage, all with the least possible disruption of the local economy. Colorado desires that a unit of the storage plan located on the Gunnison River be included in the initial authorizing legislation. It is anticipated that the re-study herein urged and further comments of the State will be made in due time so as to accomplish this purpose. Colorado pledges its full cooperation with the Bureau of Reclamation in the formulation of an acceptable Gunnison River plan."

That on September 18, 1951, the Upper Colorado River Commission, of which Colorado is a member state, unanimously approved a draft of proposed legislation for Congressional approval of the Colorado River Storage Project and Participating Projects plan of development in the Upper Colorado River Basin and for authorization of certain units of that plan. Section 1 of the proposed legislation contains the following language:

"Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That, in order to initiate the comprehensive development of the water resources of the Upper Colorado River Basin, the Congress, in the exercise of its constitutional authority to provide for the general welfare, to regulate commerce among the States, and to make all needful rules and regulations respecting property belonging to the United States, and for the purposes,

among others, of regulating the flow of the Colorado River, storing water for beneficial consumptive use, making it possible for the States of the Upper Basin to utilize, consistently with the obligation undertaken by the States of the Upper Division in Article III of the Colorado River Compact, the apportionments made to and among them in the Colorado River Compact and the Upper Colorado River Basin Compact, respectively, providing for the control of floods and for the improvement of navigation, and generating hydroelectric power, hereby authorizes the Secretary of the Interior(1) to construct, operate, and maintain the following initial units of the Colorado River Storage Project, consisting of dams, reservoirs, power plants, transmission facilities and appurtenant works: Echo Park, Flaming Gorge, Glen Canyon, Navajo and a dam or dams in the Gunnison River Basin at a site or sites to be determined by the Secretary after consultation with the Colorado Water Conservation Board; * * * * *"
(underscoring supplied)

That the Policy and Review Committee--Gunnison River Storage was created by the Colorado Water Conservation Board to aid in accomplishing the objectives set forth in the quoted portion of the State Comments and the procedure for determination of the storage plan in the Gunnison River Basin contemplated by the aforementioned proposed Congressional legislation.

V. Recommendations to the Colorado Water Conservation Board. On the basis of the foregoing findings and conclusions, the Policy and Review Committee--Gunnison River Storage recommends to the Colorado Water Conservation Board as follows:

1. That the Board approve Plan E, more specifically hereinabove described and discussed, for that part of the Colorado River Storage Project which would be accomplished in the Gunnison River Basin, such Plan E to include, and be limited to, the following storage units:

	Total Storage	Active Storage
Curecanti	940,000 A.F.	765,000 A.F.
Whitewater	880,000 A.F.	470,000 A.F.
Crystal	510,000 A.F.	425,000 A.F.
	2,330,000 A.F.	1,660,000 A.F.

(a) That the initial authorization by Congress for construction of units of the Colorado River Storage Project include and, in the Gunnison River Basin, be limited to, the above described Curecanti and Crystal storage units, and that the construction of the Whitewater unit be delayed for later authorization.

(b) That the approval of Gunnison River Basin storage, as a part of the Colorado River Storage Project plan, be subject to the conditions set forth in Paragraph 13 (a), (b) and (c) under "IV - Findings and Conclusions" of this report.

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2. That the Board approve the recommendations contained in Paragraph 14, (a) to (h), inclusive, under "IV - Findings and Conclusions" of this report, and, within the limits of its functions and in collaboration with affected local interests, aid in effectuating such recommendations.

3. That the Board, in submitting further comments and recommendations to the Bureau of Reclamation and the Secretary of the Interior on behalf of the State of Colorado, and, where pertinent, in urging Congressional approval of the Colorado River Storage Project and Participating Projects plan and the authorization for construction of units thereof, and otherwise, support the recommendations contained in this report.

4. That the Board, in the event it should disapprove or make material changes in the Gunnison River Basin plan and recommendations contained in this report, or the Bureau of Reclamation should refuse to accept, for one reason or another, the plan of development for storage in the Gunnison River Basin, approved by this report, re-refer the matter to this Committee.

Because of the resignation of Cleland N. Feast as Director of the Colorado Game and Fish Department after an agreement had been reached on the substance of a report by the Policy and Review Committee--Gunnison River Storage, but before such report was prepared in final form, this report is signed by J. D. Hart, Acting Director of the Colorado Game and Fish Department on behalf of that department.

Respectfully submitted,

Clifford H. Stone
Chairman and Director of the
Colorado Water Conservation Board

J. D. Hart
Acting Director of the Colorado
Game and Fish Department

Silmon Smith
Representative of the Colorado
River Water Conservation District

Jean S. Breitenstein
Attorney for the Colorado Water
Conservation Board

Ed L. Dutcher
Representative of Gunnison County

R. M. Gildersleeve
Chief Engineer, Colorado Water
Conservation Board

George Cory
Representative of Montrose County

Royce J. Tipton
Consulting Engineer, Colorado
Water Conservation Board

F. M. Peterson
Representative of Delta County

APPENDIX A

APPENDIX A

GUNNISON RIVER BASIN STUDY

The following is a brief of a study made by George Cory of Montrose, and F. M. Peterson of Delta, Colorado, representing the counties of Montrose and Delta, respectively, on the Policy and Review Committee of the Colorado Water Conservation Board.

The studies here presented in brief are the results of three months of labor and the expenditure of over five thousand ($5,000.00) dollars. As space will not permit inclusion of substantiating material, only the facts will be set forth. Any member of the Committee desiring the substantiating material concerning any given fact or figure here presented may request such material at any legal meeting of the Committee.

Purpose of the Study

As there has been presented heretofore only the Engineering Study of the Gunnison Basin and a certain amount of data in opposition to the construction of the Curecanti Project, the authors of the Gunnison River Basin Study attempted to approach the problem from a different viewpoint. This approach was taken because of the belief of the majority of the people of Delta and Montrose Counties that from an over-all standpoint the construction of the Curecanti Project and participating projects will be of great economic benefit to the area as a whole and to the Nation.

Mr. Peterson and Mr. Cory are fully aware of certain disadvantages to a few residents of the Upper Gunnison Valley, but we feel that in principle, these disadvantages are more in the nature of sentimental damages. The advantages by construction of the Curecanti project far exceed the disadvantages.

From the outset it was apparent that the purpose of the Curecanti Reservoir and participating projects, and the phases to be studied, would fall in the following catagories:

> A, Holdover Storage; B, Irrigation; C, Electric Power Generation, D, Industry; E, General Economy; F, Recreation; G, Fish and Wildlife; and H, National Defense.

All of the catagories were briefed by Mr. Cory at the first meeting of the Committee in Denver, Colorado, September 28, 1951, with the exception of Fish and Wildlife. This article was omitted because the nature of the article did not fulfill the request by the chairman of the Committee as to the type of statements to be discussed at the meeting, but in all prooability will be discussed fully in later meetings.

Article A - Holdover Storage

Holdover Storage is described under the four following points:

1. Holdover Storage,

2. Colorado's share,

3. Curecanti Reservoir as a holdover storage project, and

4. Stream regulation.

Point #1 - Holdover Storage

Because of the nature of the compact of 1922 between the upper Basin States and the lower Basin States, which all members of the Committee are familiar with there is a positive necessity to provide upper Basin Holdover Storage in order that water in years of excess runoff can be stored for use in years of low runoff.

During the years of 1931 to 1940 the average annual flow of the Colorado River, at Lee Ferry, amounted to 10,510,000 A. F. After deducting 7,500,000 A. F. guaranteed to the Lower Basin States, plus one-half of 1,500,000 A. F. guaranteed to the Republic of Mexico (750,000 A. F.) plus 50,000 A. F. guaranteed to the State of Arizona, there remains a balance of 2,210,000 A. F. available to the states of Utah, New Mexico, Wyoming and Colorado.

In the future Colorado should make full use of its share of the Colorado River water which would amount to 3,467,250 A. F. (based on 7,500,000 A. F. annually being available to the Upper Basin States, less 750,000 A. F. to the Republic of Mexico and 50,000 A. F. to Arizona times 51.75 per cent.) We find that during the years of 1931 to 1940 Colorado's share would only amount to 1,143,675 A. F. or a shortage of 2,323,575 A. F. would exist annually.

The question is, what would happen to the 464,715 acres of productive land that would have been planted in crops to receive the 2-1/2 million acre feet of water that would not be available? Holdover storage reservoirs in the Upper Basin States are absolutely necessary.

Point #2 - Colorado's share

In accordance with the compact of 1922, subscribed to by the States of the Upper Division, in case of a deficiency in the Colorado River each state shall contribute to the River, measured at Lee Ferry, a quantity of water which bears the same relation to the total required curtailment of use by the States of the Upper Division, as the consumptive use of Upper Colorado River System water, which was made by each such state during the water year immediately preceding the year in which curtailment becomes necessary, bears to the total consumptive use of such water in the states of the Upper Division during the same water years.

Therefore, if Colorado is to make full use of its apportioned share of the Colorado River, Colorado then must place itself in a position to provide

water to the users in the state and insure its share of a possible deficiency to the lower Basin States. As Colorado's share of the allocated water of the Upper Division is 51.75 per cent, which is far greater than any other state of the Upper Division, it is the duty of the State of Colorado to provide the largest possible amount of Holdover Storage in order that in the future when years of deficient flow occur, this deficiency can be supplied without curtailing consumptive use in the state.

Point #3 - Curecanti as a Holdover Storage Reservoir

A. The Gunnison River is the largest tributary to the Colorado River with both its source and its termination within the State of Colorado.

B. The Curecanti Reservoir as presently proposed would be high enough on the River to provide a maximum possible direct irrigation use in Colorado.

Point #4 - Stream regulation for the River can be best attained at the Curecanti location due to the convergence of the Gunnison River's largest tributaries directly into the Reservoir. These tributaries are the Lake Fork of the Gunnison, Cebolla Creek, and Tomichi Creek. The Gunnison River, itself, at this point includes Ohio Creek, Taylor River, East River and Slate Creek.

A reservoir upstream from the Curecanti site would not control all of these main tributaries, and a reservoir below the Curecanti site would not allow regulation for irrigators down stream unless the reservoir was situated above the present location of the Gunnison Tunnel.

The Curecanti Reservoir has the lowest evaporation loss of any of the Upper Colorado River Basin projects, this loss being only 1.28 per cent, while that of Glen Canyon is 2.029 per cent, or a difference on 2-1/2 million A. F. storage of 18,725 A. F. annually. This loss would be charged to the Upper Basin States.

Siltation

Over a period of 200 years, Curecanti will lose only 1.54 per cent of its active storage, while Glen Canyon will lose 47.27 per cent of its active storage over the same period of time. Therefore, from a sound business standpoint, the Curecanti project is far advantageous to Glen Canyon.

Conclusion

The Upper Basin compact gives preference in the use of reservoirs or reservoir sites to storage for consumptive use in the Upper Basin over storage to assure deliveries at Lee Ferry. The Curecanti project meets this criterion.

Article B -- IRRIGATION

The next point we wish to establish is the manner in which the local economy of the Gunnison Basin is tied in with the consumptive use of water. Most members of this committee are familiar with the Gunnison Tunnel and the Uncompahgre Project. The major portion of the water supply for the Uncompahgre Project comes from the Gunnison River. During the month of September, the most critical month in irrigation, 86 per cent of the water for the Uncompahgre Project comes through the Gunnison Tunnel. The Gunnison Tunnel has a decree for 1300 second feet of water, but can carry only 1,000 second feet of water due to the fact that a portion of it is not lined. Generally, it is assumed that there is plenty of water in the Gunnison River to fill the Gunnison Tunnel during the entire irrigation season. This is not true. Many people in the area talk about the disastrous crop years before Taylor Reservoir above the Gunnison was built to make more water available for use to the Gunnison Tunnel. However, even with Taylor Reservoir there are considerable periods in each irrigation season when the tunnel is not supplied a thousand second feet of water. We took an extensive test on water available at the Gunnison Tunnel over a six year period. The actual deficiency in delivering 1,000 cubic feet of water each year for the days of September under test is shown in the following chart:

1947		1945		1944	
Sept.	Def-cfs	Sept.	Def-cfs	Sept.	Def-cfs
23	46	25	139	25	180
24	119	26	230	26	148
25	238	27	220	27	148
26	136	28	210	28	221
27	55	29	156	29	251
28	-0-	30	117	30	281

1943		1942		1941	
Sept.	Def-cfs	Sept.	Def-cfs	Sept.	Def-cfs
6	-0-	25	302	25	136
7	-0-	26	320	26	201
8	-0-	27	348	27	235
9	-0-	28	344	28	280
10	-0-	29	328	29	232
11	-0-	30	373	30	115

To get the shortage for the full 1300 second foot decree we have added another 300 second feet. The following table shows this shortage:

ALL DATES ARE IN SEPTEMBER

1947		1945		1944		1943	
	Def-cfs		Def-cfs		Def-cfs		Def-cfs
23	346	25	439	25	480	6	59
24	419	26	530	26	448	7	4
25	538	27	520	27	448	8	64
26	436	28	510	28	521	9	19
27	355	29	456	29	551	10	295
28	300	30	417	30	581	11	248

1942		1941	
	Def-cfs		Def-cfs
25	602	25	436
26	620	26	501
27	648	27	535
28	644	28	580
29	628	29	532
30	673	30	415

Could more water be let down from Taylor Reservoir? We examined that possibility completely over a 13-year period. Taylor Reservoir has released an average annually of 46,200 acre feet. The question now is: could it have released more? It could not release in excess of another 5,000 acre feet. The total amount of stream flow above Taylor Reservoir taken on a five year average was only 66,000 acre feet per year. Some of this water must be released at times other than the irrigation season. Fortunately for the Uncompahgre Project there has never been three successive years during which more water had to be let down than could be stored the following winter. A 75,000 acre foot release for a period of three years would very probably leave Taylor Reservoir low in storage, and if the subsequent year were dry, disaster to the crops of the Uncompahgre Project in Delta and Montrose Counties would be the result. Additional water can not be supplied the Gunnison Tunnel through Taylor Reservoir releases. In proof of the above statements a chart follows on the refilling capability of Taylor River and on Taylor Reservoir releases:

TABLE B-1a

Step 4B

REFILLING CAPABILITY OF TAYLOR RIVER

	1934	1933	1932	1931	1930
Oct.	2850	2820	2900	4190	6640
Nov.	2200	2010	2980	3810	4170
Dec.	2340	2620	2950	3440	3380
Jan.	2280	1490	2700	1440	2460
Feb.	2050	1340	2240	1510	3050
Mar.	2280	1990	2640	2390	3690
Apr.	7140	2770	4340	4940	5060
May	12100	7440	17600	8420	12500
June	5650	25100	28000	9400	21700
July	4450	6950	14200	4910	8180
Aug.	3750	3760	6050	2790	6580
Sept.	3100#	2980	3560	2270	3900
	50190	61270	90160	49410	81310

1. These are the flows in acre-feet for the Taylor River at Taylor Park prior to construction of Taylor Dam.

2. The annual average refill capability of Taylor River at Taylor Park is 66,468 acre-feet.

3. Taylor Reservoir release of storage during the irrigation season averages 46,200 acre-feet annually.

4. This leaves an average of 20,268 acre-feet annually for further refill purposes. But of this 10,000 to 20,000 acre-feet annually has to run past the dam during the balance of the year.

\# This is a calculated figure based on the average of the figures available for other years.

TABLE B-1b

TAYLOR RESERVOIR RELEASES
UNCOMPAHGRE VALLEY WATER USERS ASSOCIATION
Montrose, Colorado

YEAR	DATE OF RELEASE	DATE SHUT OFF	ACRE FEET USED
1938	Aug. 5	Sept. 2	13,250
1939	July 11	Oct. 31	78,610
1940	July 4	Oct. 15	75,420
1941	Aug. 2	Oct. 1	37,255
1942	Aug. 7	Oct. 10	46,710
1943	Sept. 10	Oct. 16	26,140
1944	Aug. 1	Oct. 3	62,340
1945	July 29	Oct. 10	28,420
1946	July 27	Oct. 8	42,810
1947	Sept. 4	Nov. 1	19,768
1948	Aug. 1	Oct. 3	51,449
1949	Aug. 14	Oct. 8	41,818
1950	July 21	Oct. 7	75,500

1. Through 1950 Taylor Lake had been releasing water for 13 years.

2. Taylor Lake releases water for an average of 64 days each irrigation season.

3. Taylor Lake Release of Storage averaged 46,200 acre feet annually over the 13-year period from 1938 through 1950.

4. This is an average of 721 acre feet per day, or 360 second feet per day.

The only remaining alternative is to take water from the Uncompahgre River. The Water Users of the Uncompahgre Project only have four second feet of water out of that river in the first 200 second feet of flow. During the late irrigation season there is usually less than 100 second feet in the Uncompahgre. Therefore, relief is not available from that source.

Crops are burning out on the Uncompahgre Project. In a survey in September of 1951, the ditch riders found that 840 acres of land were lost to production this season. Some land was not planted due to the short water supply in the early season, other acreages were abandoned in the middle of the season, and other acreages burned up at the end of the season.

The Uncompahgre Project can satisfy its full decrees of 1300 second feet, or its 1,000 second feet carrying capacity, by two possibilities: one, shut down the decrees above the tunnel that are junior to the tunnel. These decrees total 5,974 second feet. It would be inefficient to shut down these decrees, inasmuch as there would only be saved for use at the Gunnison Tunnel, water that had been consumptively used in the Gunnison area. This water would not amount to one-third of the decrees, but the results to Gunnison would be severe. The second means of supplying the Gunnison Tunnel the amount it will carry or the 1300 second feet of its decree, is to have regulated storage on the main stream of the Gunnison above the Gunnison Tunnel. There are other direct uses of water out of the Gunnison Reservoir. We took a 10 year test, one week in each year, in the Delta area. There was a deficiency in water available to satisfy the decrees in all but one year of the 10 tested. We tested weeks other than those tested for the Uncompahgre Project. The deficiency in 1940 exceeded 600 second feet. Four other years averaged more than 300 second feet. The minimum shortage in the remaining four years was 100 second feet per year. Many decrees in the Delta area, the Hartland; Bonafide; Trial; Relief; and others have decrees senior to the Gunnison Tunnel. These decrees total 191 cubic second feet. In 1934 and again in 1951 the District Water Engineer has turned water past the Gunnison Tunnel in order to supply the senior decrees in the Delta area.

The North Delta Canal next year will appropriate more of its decrees as a result of a loan secured to enlarge the canal and bring new land under irrigation. In addition to the existing use, 137 cubic feet approximately will be required when the North Delta Canal lands are completely developed.

There are 560 acres of land on Goddard Mesa in Montrose County that can be irrigated directly out of the existing Uncompahgre Project. This land can be irrigated from the ditches of the Uncompahgre Project. More water will be required.

We took it upon ourselves to check the Jex Report. The Jex Report is a reconnaissance survey, which is assumed to be in sufficient detail to indicate the feasibility of a project, and the worth of producing the detailed plans for building it. A registered Civil Engineer was employed to check the Jex Report. This engineer did some actual field work in checking it. His report was: that for the purpose of establishing the feasibility of the partici-

pating projects, the Jex Report was quite adequate. He continued that any further surveys, before it was decided which projects would be built, was a waste of valuable engineering talent and taxpayers' money.

The land proposed to be irrigated by the Jex Report is suitable for irrigation. We obtained land classification studies on every participating project in the Gunnison Basin proposed by the Jex Report, and some land classification studies on other participating projects for comparison. The lands proposed to be irrigated by the Jex Report are of like quality to lands presently irrigated in the Gunnison Basin and in some cases superior.

Irrigated new lands made possible in Gunnison County by participating projects are 39,370 acres; in Delta County, 22,500; in Montrose County, 14,600 acres; in Mesa, 5,570 acres; in Ouray, 10,750; and in Saguache, 6780 acres, with other small scale development at 8,000 acres. The total is 107,570 acres. Supplemental water will be supplied to 96,360 acres. Colored pictures were taken to show the lands that can be put under irrigation on the various participating projects and to show the lands that need supplemental water. These slides will be shown to the committee upon request.

It is generally assumed that the Bureau of Reclamation will enter into a participating project with a group of people when the benefits exceed the costs and when the lands have a repayment ability. A good share of the projects in the Gunnison Basin are in good shape in this respect. We believe that all the participating projects proposed in the Jex Report will be built. The benefits to cost ratios have improved. The benefits were figured on price levels during the 1939 to 1944 period. The costs were figured on 1949 construction rates. A new formula is now being developed to base the benefits on more recent years.

America must have more production. The wheat carry-over is down; the wheat carry-over in 1952 will be only 32 per cent of our annual requirement; the corn carry-over is down, the amount of carry-over for 1952 is 100 million bushels down from 1951. Our total carry-over of corn will only be 20 per cent of the annual requirement. Military kitchens require a supply of eight to nine months; civilian, only seven to nine days. The average American is eating 13 per cent more food than he did in the 1935 to 1939 period. Population has increased 20 million since 1940, or 15 per cent. The Department of Agriculture has put out the request for all-out production in 1952.

In the past 10 years, 3,800,000 acres of new land have come under cultivation in Colorado, and agricultural land at this time totals 10,800,000 acres. With that sort of expansion, can anyone assume that an additional 107 thousand acres of irrigated land will not be put into cultivation?

In our report we have started with official data which tells us how the economy of today is built. There will be a total increase of approximately 1100 farms in the Gunnison Basin. Farm expenditures in the Gunnison Basin will increase 7 million dollars a year on an annual basis when full development of

the Curecanti and participating projects is realized. This is more than the present farm expenditures of any county of the area, with the exception of Mesa County. Farm income in the entire area will increase $13,581,000 a year.

Increased value of farm land, buildings, implements, machinery, and livestock with full development of the Gunnison River Projects will be $17,257,000. On the conservative estimate of a 40 mill levy an additional $345,000 per year will be gained in tax revenue.

There has been too much emphasis placed on normal flow in the discussion of water. Minimum flow figures must be used because agriculture and industry must live within minimum flows. In simple words, if we do not get storage in Western Colorado very soon, we will have lost surplus flows in April, May and June. If this happens, Western Colorado can never grow to any extent--ever. We will have lost the opportunity to let our children remain at home to earn their livelihoods, as their fathers were privileged to do.

SECTION I, ARTICLE C -- Electric Power Generation and Transmission

Curecanti will provide a much needed supply of electric energy for present and potential use on the Western Slope of Colorado.

To indicate the present shortage of electric power, in 1950 the largest supplier of electric energy on the Western Slope (The Western Colorado Power Company) registered a demand of 19,340 kilowatts, which was supplied by a series of generating plants having a total installed capacity of only 18,732 kilowatts.

Due to the present high cost of generation, it is estimated by a certain formula of projection that if the Curecanti project were supplying the electric energy of the municipalities, REA Coops and Power Company within the immediate area, the savings to these distributors by 1956 and in turn to the consumer would amount to $1,957,526 annually.

We are all aware of the vast amounts of natural resources such as coal, metals, and timber, that an abundance of cheap, firm electric energy would aid in developing. For example, a 10,000 bbl. per day coal hydrogenation plant would require 68,000 kilowatts of electricity. It is not out of reason to suggest that from one to three such plants may be located in the basin if Curecanti power plant and interconnecting loop circuit transmission line were to be constructed.

In order that the project can be classified as feasible and to aid in construction of Curecanti, electric energy must be generated and sold at a rate that would come within the upper basin project average and yet earn a surplus to retire the cost of the project, operate and maintain the entire project, and pay to the Upper Colorado River account three per cent of the cost of the generation facilities. Curecanti as now planned will meet this requirement.

The TVA, Bonneville and Hoover Dams, are among the many public power projects that are paying their way far in excess of original expectations. Curecanti should not prove the exception.

D -- INDUSTRY

Little can be said of existing industry in Western Colorado. There is practically none. Potential industry must concern us, however. Industrial expansion is possible and probable in the metals industry. There are known deposits of 18 metalic minerals and 18 non-metalics in the Gunnison River Basin.

The growth of communities in other parts of the Nation, the growth of population in the Nation as a whole, plus two major world wars, has placed a burden on the resources of the Nation. This, coupled with the fact that many areas outgrew their resources, makes it necessary now to decide whether or not the people of the Nation and the Gunnison Basin in particular in this case, want to face the adjustment necessary to assist in stabilizing the country as a whole and the Gunnison Basin in particular, or whether the under developed areas are to be disregarded until emergency strikes, or until the opportunity is lost.

The pattern of economics in the Nation is so complicated now and the public is so confused that they understand but little of the factors in their existence and future. No wonder fear and misunderstanding exists. No wonder people develop attitudes that create tendencies to live for today only.

Production has been pointed to by many economists as the solution to maintaining our standard of living. Actually, there are three factors. They are, in order; natural resources, production, and a stable market. We can not maintain production in the United States without resources. If the Western Slope of Colorado had little else to offer besides its water, it might be a wise plan to ignore its existence. The Western Slope, however, is fortunate in having many important undeveloped resources. Many of these resources are important to the future National economy. Our development will depend on valuable, useable, water and electricity. And, for that reason we are arguing and pleading for fair play in the consideration of the case of water storage in the upper part of the Upper Basin of Western Colorado.

New industry can not locate along the Gunnison River as there is no unappropriated water. We must concern ourselves with minimum flow. Right now the Nation is vitally interested in coal hydrogenation to produce oil and other synthetic products. One hundred seventy-six cubic feet per second of water is required for one coal hydrogenation plant of 10,000 bbl. capacity. This includes all needs, a plant, electricity generation, and domestic uses. The capital investment in only one such plant exceeds the assessed valuation of Gunnison, Mesa, Ouray, Montrose, Delta, and San Miguel Counties combined. The Delta-Gunnison area has enough coal for 82 such plants and sufficient water if the water is stored.

Without holdover storage such as Curecanti there can never be industrial expansion in the area.

In simple words, if we do not get storage in Western Colorado very soon, we will have lost, forever, the surplus water that supposedly flows in April, May and June. Industry and agriculture have both developed in those portions of the Nation where there has been sufficient water and sufficient electrical power. For maximum development the storage should be large enough to completely regulate the river.

The static condition that exists in Delta, Montrose, and Gunnison Counties, is clearly pointed out by a comparison of the population figures of 1940 and 1950. In 1940 Delta County had 16,470 people; in 1950, 17,335 people, a very slight increase; in 1940 Gunnison County had 6,192 people and in 1950, 5,609, slightly lower. In 1940 Montrose County had 15,418 people and 15,024 in 1950, another decrease. To provide the young people of the area an opportunity to remain at home, expansion of some type must be undertaken. The National increase in population over the period 1940 and 1950 was 20 million people, or 15 per cent. An increase of approximately 1100 farms in the area will definitely mean an increase in farm population. It is estimated the gain will mean 4069 new farm people in the area. Such an increase will make possible increases in city and town populations serving the farms. Opportunities and jobs made possible by this increase in farm population will probably mean at least an equal increase to the trade centers.

A study by the University of Oklahoma states:..."If a community employs 2,000 workers in its factories, the advantages are even greater. A manufacturing industry of 2,000 workers will support 1,600 workers in agriculture; 400 in construction; 600 in transportation and public utilities; 2,000 in services; 1,600 in trade and finance. This group normally constitutes about 40 per cent of a total population. So factories employing the original 2,000 persons would be responsible for a population of 22,500 persons directly or indirectly affected in the community."

Western Colorado must look to both agricultural and industrial development as its fair share in the responsibility of developing the Nation and maintaining our standard of living.

SECTION I, ARTICLE E - GENERAL ECONOMY

The General Economy Section of this report was compiled and written for the purpose of eliminating guess work, rumor, and distortion of facts in consideration of Curecanti as it will effect the economy of the Gunnison Basin.

It was necessary to consider the effect of Curecanti

(a) during the construction period, and

(b) during the post construction period.

Background statistics were compiled and related in dollar figures to the Gunnison Basin projects. Previous considerations of Curecanti have been so limited in scope that no cognizance was taken of the distribution of the money spent in the area for construction. The building of new farm houses, the additional income from crops and increased cattle production were not considered.

This report on General Economy sets forth in considerable detail the breakdown costs, the allocation of project payroll to various types of consumer expenditures, the breakdown of participating projects costs and the allocation of participating projects payroll to various types of consumer expenditures. The capital farm increase as a result of construction of Curecanti and its participating projects is developed. The allocation of annual farm expenditures at the retail level is projected. And, many other significant economy factors brought to light.

The studies from which these facts and estimates were obtained depend upon official data for their basis. In developing this section we have taken a positive approach to the question of, what does Curecanti mean to the area?

This section is important in determining the benefits as contrasted to the possible damages that might be done as a result of Curecanti. This section should establish with reasonable accuracy the over-all effect of this project on the General Economy. It is from a high level of economy that America derives its standard of living.

Table 26 shows the estimated percentage breakdown of the total project cost of Curecanti alone. The same percentages of total costs can, however, be applied to the participating projects. This table is used as a basis of allocating costs.

Table 28 shows the allocation of Curecanti payroll to various types of consumer expenditures. Table 30 shows the allocation of participating project's payrolls to various types of consumer expenditures, and Table 32 combines the allocation of Curecanti and participating projects payrolls to various types of consumer expenditures to show the total impact over a period of years.

As previously pointed out, additional annual farm expenditures will have a tremendous effect on the retail economy of the entire Gunnison Basin. This projection is made in Table 34. Also, many new farm buildings will be built over a period of years. Table 36 shows the allocation of estimated farm building payroll. Estimated annual costs of Curecanti are set forth in Table 37. Table 33 shows the capital farm increase as a result of construction of Curecanti.

The combination of these various economic factors will have great influence in creating an expanded economy and a higher standard of living on the Western Slope. Such an expanded economy will enable the Western Slope to keep one of its most valuable crops--its young people--at home.

TABLE E-26

ESTIMATED PERCENTAGE BREAKDOWN
OF TOTAL PROJECT COST

Item	Percent of Total Cost
Payroll	30% - 35%
Equipment a/	15% - 18%
Maintenance, repair and operation of equipment	12% - 15%
Permanent Materials	25% - 30%
Overhead	2% - 12%

a/ Includes interest, insurance, taxes, and depreciation. Of the total equipment cost, 2 percent is estimated as taxes, 2 percent as insurance, and 6 percent as interest.

Source: Rhoades, W. C., Licensed Engineer, Horner & Switzer, Construction Company, Denver, August, 1951.

TABLE E-28

ALLOCATION OF PROJECT PAYROLL TO VARIOUS TYPES
OF CONSUMER EXPENDITURES

Item	Percent of Total Income a/	Estimated Expenditures b/
Food	24.6	7,457,000
Housing, Fuel, Light & Refrig.	13.2	4,001,000
Household Operation	3.9	1,182,000
Furnishings & Equipment	5.8	1,758,000
Clothing	10.7	3,243,000
Transportation - Auto & others	11.1	3,365,000
Personal care	1.9	576,000
Medical care	5.4	1,637,000
Recreation	3.2	970,000
Tobacco	1.2	364,000
Reading	0.7	212,000
Education (Formal)	0.3	91,000
Miscellaneous	2.2	667,000
Gifts and Contributions	3.9	1,192,000
Insurance	4.2	1,273,000
Net Surplus	0.0	0
Personal Taxes	7.6	2,304,000

a/ Based upon U. S. Bureau of Labor Statistics' breakdown of expenditures for Denver families with two or more persons in 1948. The average of all income groups receiving less than $10,000 used in this computation.

b/ Based upon the total estimated project cost made by the Bureau of Reclamation and increased to current price levels as recommended by W. C. Rhoades, Horner & Switzer Construction Company. Payroll estimated as 33.3 percent of total project cost as suggested by W. C. Rhoades.

TABLE E-30

ALLOCATION OF PARTICIPATING PROJECT'S PAYROLLS
TO VARIOUS TYPES OF CONSUMER EXPENDITURES

Item	Percent of Total Income a/	Estimated Expenditures b/
Food	24.6	8,384,000
Housing, Fuel, Light & Refrig.	13.2	4,499,000
Household Operation	3.9	1,670,000
Furnishings & Equipment	5.8	1,977,000
Clothing	10.7	3,408,000
Transportation - Auto & others	11.1	3,783,000
Personal care	1.9	648,000
Medical care	5.4	1,840,000
Recreation	3.2	1,091,000
Tobacco	1.2	409,000
Reading	0.7	239,000
Education (Formal)	0.3	102,000
Miscellaneous	2.2	750,000
Gifts and Contributions	3.9	1,670,000
Insurance	4.2	1,431,000
Net Surplus	0.0	0
Personal Taxes	7.6	2,590,000

a/ Based upon U. S. Bureau of Labor Statistics' breakdown of expenditures for Denver families with two or more persons in 1948. The average of all income groups receiving less than $10,000 used in this computation.

b/ Based upon the total estimated project cost made by the Bureau of Reclamation and increased to current price levels as recommended by W. C. Rhoades, Horner & Switzer Construction Company. Payroll estimated as 33.3 percent of total project cost as suggested by W. C. Rhoades.

TABLE E-32

ALLOCATION OF CURECANTI AND PARTICIPATING PROJECTS PAYROLLS
TO VARIOUS TYPES OF CONSUMER EXPENDITURES

Item	Percent of Total Income a/	Estimated Expenditures b/
Food	24.6	15,841,000
Housing, Fuel, Light & Refrig.	13.2	8,500,000
Household Operation	3.9	2,852,000
Furnishings & Equipment	5.8	3,735,000
Clothing	10.7	6,651,000
Transportation - Auto & others	11.1	7,148,000
Personal care	1.9	1,224,000
Medical care	5.4	3,477,000
Recreation	3.2	2,061,000
Tobacco	1.2	723,000
Reading	0.7	451,000
Education (Formal)	0.3	193,000
Miscellaneous	2.2	1,417,000
Gifts and Contributions	3.9	2,862,000
Insurance	4.2	2,704,000
Net Surplus	0.0	0
Personal Taxes	7.6	4,894,000

a/ Based upon U. S. Bureau of Labor Statistics' breakdown of expenditures for Denver families with two or more persons in 1948. The average of all income groups receiving less than $10,000 used in this computation.

b/ Based upon the total estimated project cost made by the Bureau of Reclamation and increased to current price levels as recommended by W. C. Rhoades, Horner & Switzer Construction Company. Payroll estimated as 33.3 percent of total project costs as suggested by W. C. Rhoades.

Table E-33 - Corrected

CAPITAL FARM INCREASE AS A RESULT OF CONSTRUCTION OF CURECANTI

County	Increase Value of Farm Land and Buildings a/	Increase Value of Farm Implements and Machinery	Increases in Total Income b/
Gunnison	$3,356,000	$310,000	$3,666,000
Saguache	411,000	47,000	458,000
Montrose	1,504,000	201,000	1,705,000
Delta	3,870,000	456,000	4,326,000
Ouray	743,000	73,000	816,000
Mesa	1,043,000	109,000	1,152,000
Total	$10,927,000	$1,196,000	$12,123,000

a/ Column headings and figures corrected as suggested by Mr. George Cory in telephone conversation of September 4, 1951.

b/ Totals changed as a result of corrections.

Source: Mr. George Cory

Table E-34 - Corrected

ALLOCATION OF ANNUAL FARM EXPENDITURES

Item	Percent of Total a/	Expenditures b/
Food	24.6	$1,827,000
Housing, Fuel, Light, and Refrig.	13.2	980,000
Household Operation	3.9	290,000
Furnishings and Equipment	5.8	431,000
Clothing	10.7	795,000
Transportation - Auto and Other	11.1	825,000
Personal Care	1.9	141,000
Medical Care	5.4	401,000
Recreation	3.2	238,000
Tobacco	1.2	89,000
Reading	0.7	52,000
Education (Formal)	0.3	22,000
Miscellaneous	2.2	164,000
Gifts and Contributions	3.9	290,000
Insurance	4.2	312,000
Net Surplus	0.0	0
Personal Taxes	7.6	565,000
Total		$7,422,000

a/ Based upon U. S. Bureau of Labor Statistics' breakdown of expenditures for Denver families with two or more persons in 1948. The average of all income groups receiving less than $10,000 was used in this compilation.

b/ Total farm expenditures of $7,422,000 obtained from Mr. George Cory in telephone conversation of September 4, 1951.

Table E-36

ALLOCATION OF ESTIMATED FARM BUILDING PAYROLL

Item	Percent of Total a/	Expenditures	
		Payroll $1,500,000	Payroll $2,000,000
Food	24.6	$369,000	$493,000
Housing, Fuel, Light, and Refrigeration	13.2	198,000	265,000
Household Operation	3.9	59,000	78,000
Furnishing and Equipment	5.8	87,000	116,000
Clothing	10.7	160,000	214,000
Transportation - Auto and Other	11.1	166,000	222,000
Personal Care	1.9	29,000	38,000
Medical Care	5.4	81,000	108,000
Recreation	3.2	48,000	64,000
Tobacco	1.2	18,000	24,000
Reading	0.7	11,000	14,000
Education (Formal)	0.3	5,000	6,000
Miscellaneous	2.2	33,000	44,000
Gifts and Contributions	3.9	59,000	78,000
Insurance	4.2	63,000	84,000
Net Surplus	0.0	0	0
Personal Taxes	7.0	114,000	152,000

a/ Based upon U. S. Bureau of Labor Statistics' breakdown of expenditures for Denver families with two or more persons in 1948. The average of all income groups receiving less than $10,000 was used in this computation.

TABLE E-37

ESTIMATED ANNUAL COSTS
OF CURECANTI UNIT

In December 1949 Prices

Feature	Operation and Maintenance	Replacement	Total
Dam and Reservoir	$ 19,000	$ 12,100	$ 31,100
Power Plant	112,900	49,600	162,500
Transmission System	102,100	82,400	184,500
Total	$234,000	$144,100	$378,100

Allocated to:

Irrigation and Other Water Consuming Uses	$ 18,900
Power	359,200
Total	$378,100

Source: U. S. Bureau of Reclamation, "Colorado River Storage Project and Participating Projects, Upper Colorado River Basin", p. 29 and p. 92.

SECTION I - ARTICLE F - RECREATION

Official testimony and comments on the recreational potential of Curecanti of a positive nature have been entirely lacking. The entire problem has been approached from the standpoint of:

What can't be done?

instead of,

What can be done?

In the recreation section of this report we have opened with a general study on the conservation and development of outdoor recreational resources of the Nation. This general study is intended to show what has happened, how problems of recreational development are resolved, and the future development possible. Actual case studies are developed to show the positive good of water resources as recreational areas. The dollar value in recreational benefits to the area provided by additional farm families has been developed during the construction period and on an annual basis.

The study then considers individual dams and lakes throughout the Nation.

Statistical information and facts are set forth at the local level to show what's happening and what can happen as a result of Curecanti. This study represents work and effort and certainly must be considered more reliable in its projections than the general assumptions which have been made based upon individual and limited personal experience. It is suggested that local people follow the suggestions of this section in obtaining the help of the proper planning agency to make the Curecanti area the finest recreational section in the Nation. A definite program is outlined by the Federal Inter-Agency Committee on Recreation. A constructive approach to the benefits of Curecanti is long overdue. If Curecanti attracts only one-eighth as many tourists as Hoover Dam, and they spend $10.00 each in the area, $2,500,000 additional will be spent in the area each year.

Local, county, and state officials with proper initiative can secure tremendous aids of all kinds in establishing a dam site and reservoir as a fine recreation center within the limits of the natural conditions. As a guide to such efforts it is recommended they secure from the United States Department of the Interior, Volume I and II of the Report on the Conservation & Development of Outdoor Recreational Resources. This report covers completely all aspects of recreation planning and sets forth Federal, state and local responsibilities in connection with Federal projects.

It would appear that Curecanti would be in an extremely advantageous location to attract tremendous numbers of tourists if built. The people in the central section of the country, the states that border or are very close to us, such as Texas, Oklahoma, Nebraska, the Dakotas, Iowa, and Arizona are located especially disadvantageously so far as use of the type scenery and facilities that we have in this area. It can be statistically supported that Denver would provide one-third as many visitors to Curecanti as Los Angeles provides to Hoover Dam. The stretch of river where Hoover Dam is located, in 1930 was seldom visited. In 1951 to date the total visitor count exceeds 2,000,000 people. These visitors spent considerable money.

In a recent study of tourist travel in one section of the country it was revealed that 1,159,000 people visited a certain area, and spent a total of about 11 million dollars in that vicinity. The visitors reported that they spent 31 million dollars more on the entire vacation trips. This was in 1947. It was estimated by the National Park Service during the war years that the annual visitation to the Lake Texoma Recreational area would range between 600,000 and one million people, and that an investment of approximately 6 million dollars would be required to develop the recreation facilities needed to meet the demands of the people. Actual travel figures over a three-year period have proven that the original estimates were far too conservative. About 2,400,000 people visited the area in the travel year ended September 30, 1948 and on the basis of a steadily increasing travel count since that date, it appears certain that at least 3,000,000 visitors will be recorded during the travel year of 1950. It was found, as a result of this study, that private capital in an amount exceeding $2,350,000 had been invested in developments around the lake and in the communities within a 15-mile radius as a direct result of the lake, and the new opportunities for recreation activities that were offered.

Following are a few excerpts from various studies we have examined:
"The total attendance at the 75 reservoir projects of the Corps of Engineers during 1949 amounted to approximately 10 million visitor days."
"The reservoir projects in or near natural recreation regions provide additional opportunities for development of the natural recreation resources of those regions."
"Public use of these reservoir projects generally commences many months in advance of full impoundment. Fishing in the stream channel downstream from the dam generally increases as closure of the dam across the stream channel nears completion."

In general, water-improvement projects of the Corps of Engineers, particularly reservoirs and navigation pools, have already experienced annual use several times greater than was estimated during planning studies.

The Bureau of Reclamation has printed a report on the recreational development and use of reservoirs. This report establishes without question the large numbers of people who visit reservoir developments in Colorado. For example, in 1949, 51,000 people visited the Colorado-Big Thompson Project. This is twice as many people as visited Black Canyon. Taylor Park above Gunnison had 8,500 visitors in 1949. The Minidoka Lake Project in Idaho was visited by 57,000 people. The Milk River Project in Montana was visited by 66,000 people. The Sun River Project in Montana by 37,000 people. The Rio Grande Project, consisting of Caballo and Elephant Butte, had 70,000 visitors. The Pine River Project in Colorado, on which is located Vallecito Lake, had 29,400 visitors. There are well too many Coloradoans who don't know where Pine River is. Despite this fact, this lake drew 29,400 visitors--more than did Black Canyon in 1949. The figures concerning use of lakes in sparsely populated areas has been purposely used to demonstrate the attraction such projects offer to tourists. Curecanti being the size it will be, obviously will give this area great economical advantages.

Our study covers Shasta Dam, Bonneville, Hoover, the Lake Texoma project, TVA lakes and dams, Utah projects, Colorado projects, and others. In some instances we have included greatly detailed economic charts which cover every aspect of the development at certain lake projects. These studies proved beyond doubt the direct recreational advantages. It is not so much now a case of what will happen as it is a case of observing what has happened. In this sense we are speaking of a major dam such as Curecanti, located on a transcontinental highway.

As stated at the beginning of our report to the Committee, we have presented a brief statement which is only a minute portion of the total material we have compiled. Many phases of our report have not been touched upon at all. It has been our desire to avoid any material that at this time is considered controversial. After a thorough investigation of all aspects of this problem, which has required more than 3-1/2 months of the full time of two men in organizing it, and the services of many professional firms, whether or not to build Curecanti should no longer be a point of contention; the question now, is, how soon?

The following table on recreation shows the expenditures of an entirely local nature that will result with the completion of Curecanti and the participating projects.

. . . . . .

R E C R E A T I O N

Curecanti	$ 970,000.00 *
Participating Projects	1,091,000.00 *
Annual Farm Expenditure	225,000.00 **
Total Direct Recreation	$ 2,286,000.00
Annual Service Expenditure	225,000.00
Total Direct and Indirect Recreation	$ 2,511,000.00

* During Construction Period
** Annual Expenditure

. . . . . .

Reference for all material will be supplied upon request at any meeting of the Committee. The Certified Public Accountants, Civil Engineers, the Research Bureau, and others who were employed professionally to help compile this report can be called upon to testify. All portions of the report where economic projections are utilized have been submitted to a Business Research Bureau and their analysis and comments as to accuracy of methods and results, will be made available at any committee meeting.

APPENDIX B

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APPENDIX B

CURECANTI RESERVOIR
STUDY RELATIVE TO EFFECT UPON GUNNISON COUNTY

(Prepared by Gunnison County interests and presented at a meeting of the Colorado Water Conservation Board on June 12, 1951)

* * * * * * *

Land classification study by Bureau of Reclamation:

Irrigated lands, total for Gunnison County - - - - - - -			47,460 acres
Inundated reservoir basin - irrigated		5,049	
Plus additional land placed under irrigation since survey -		1,219	
	Total	6,268	acres, irrigated lands inundated.
Other lands inundated		11,951	
		4,800	public lands
		7,151	acres of misc. private lands inundated.
Number of ranch units affected:	22		

Livestock on lands that will be inundated:

Registered adult cattle	1,069	
Registered Calves	505	
Total registered cattle		1,574
Commercial adult cattle	4,125	
Commercial calves	1,668	
Total commercial cattle		5,793
Dairy cattle		200
TOTAL CATTLE -		7,567

(Of the total cattle affected, 1,654 are kept the year around on ranches that will be inundated. It is impossible to determine how many, if any, of the cattle can be cared for on other lands located in Gunnison County. It is doubtful whether any large number of these can be kept in Gunnison County on other lands.)

Sheep:	5,000 ewes
Horses:	327 head

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CURECANTI RESERVOIR - Study Relative to Effect upon Gunnison County

(Continued)

Misc. Property inundated:

22 resorts, consisting of 173 units, 15 resort homes, 2 hotels, 1 office and 3 stores, 36 summer homes; 3 permanent homes; 3 schoolhouses and lands upon which same are located; 1 restaurant, gas station, etc.; 1 dance hall, tavern, grocery store, gas station and home combined.

1 cemetery located at Sapinero (approximately 50 graves).

27 miles of railroad between Gunnison and Sapinero.

Loss of Revenue (annually):

Loss of revenue, ad valorem taxes to Gunnison County alone for County purposes -	$ 27,008.00
Loss of school taxes (including high school)	13,863.00
Total loss of revenue to Gunnison County - - - - -	$ 40,871.00
(This is 10.4% of total County revenue)	

Economic loss (annually):

Loss of business from resorts; 173 units averaging 2 people (a large number of these units accommodate 4 people); 80 days filled to capacity of the 155-day season at $10.00 per day for lodging, meals, gas, oil, fishing equipment and other items purchased in Gunnison County -	$ 276,800.00
Loss of income from registered cattle -	$ 100,000.00
Loss of income from 2500 head commercial cattle -	500,000.00
Total loss of income from cattle -	$ 600,000.00
Loss of income from 4000 head of sheep -	80,000.00
Total estimated loss of business -	$ 956,800.00

APPENDIX C

APPENDIX C

MEMORANDUM
June 7, 1951

To: Clifford H. Stone, Director

From: R. M. Gildersleeve, Chief Engineer

Subject: Estimated maximum effect to Gunnison County of construction of proposed Curecanti Reservoir

Pursuant to your request the engineering staff has participated in an investigation to determine (1) the amount of ranch land which would be inundated if Curecanti Reservoir should be constructed according to the present plan; (2) the number of cattle and sheep which are supported on such lands together with the number of resorts and summer homes in the reservoir basin; and (3) the loss to Gunnison County in actual revenue from ad valorem taxes which would result from the reservoir construction. At your suggestion the investigation was carried on jointly by representatives of the Grand Junction area office of the Bureau of Reclamation and the Water Conservation Board, with the assistance of the Gunnison Watershed Conservation Committee.

Mr. Colburn represented our staff, Mr. Jex and Mr. Black, the Bureau of Reclamation, and Mr. Craig Goodwin of Gunnison cooperated in the field investigation. The office of the County Assessor gave valuable assistance in furnishing information from the assessment records.

(1) The land classification maps of the Bureau of Reclamation showed that in 1945 a total of 47,460 acres of meadow land was being irrigated in Gunnison County. Analysis of the irrigated land, taking into account the high water elevation of the proposed Curecanti Reservoir, indicated that of those 47,460 acres about 5,049 acres, or 11 percent, would be inundated by the reservoir, and that in addition there are 1,219 acres in the basin which are either under ditch at the present time or could be placed under irrigation at nominal cost. The records of the Bureau also show that there are approximately 4,800 acres of federal or state lands which would be inundated. Also within the high water area are about 6,000 acres of privately owned lands which have been classified as grazing lands or miscellaneous lands by the County Assessor. The total area of the high water line, as nearly as can be determined at the present time, is about 17,000 acres.

(2) Practically all of the owners of property within the reservoir basin were interviewed. The following tabulation shows the livestock in the area as reported by the property owners:

	Over 1 year	Calves	Total
Registered cattle	1,069	500	1,569
Commercial cattle	4,125	1,668	5,793
Dairy cattle			200
Cattle kept on ranches year round			1,654
Sheep			5,000
Horses			327

In addition, the following information was obtained regarding improvements or facilities within the basin, together with the value of the same as estimated by their owners:

Type of Property	Value as estimated by owners
22 resorts, consisting of 173 units, 15 resort homes, 2 hotels, 1 office and 3 stores	$ 964,000
36 Summer homes	$ 439,700
School buildings, consisting of 3 schoolhouses and 3 permanent homes	$ 58,000
Restaurant and gas station	$ 18,000
Dance hall, tavern, grocery store, gas station and home combined	$ 60,000
Cemetery at Sapinero	- -
27 miles of railroad	- -

No estimates as to values regarding the above property were made by representatives of the Bureau of Reclamation or the Water Conservation Board.

(3) The plat books in the County Assessor's office were examined and the ownerships as indicated were marked by 40 acre tracts on a map of the area in which the proposed Curecanti Reservoir is located. The high water line of the reservoir was then drawn on the same map. The tracts of privately owned lands which would need to be purchased for the reservoir right of way were then determined. In this determination it was assumed that if the high water line cut through a 40 acre tract the entire 40 acres would be purchased. The total of such assessed land required for actual right of way was found to be 16,625 acres.

The tracts sere then segregated as to owners and compared with the classifications for the owners on the assessor's records. In the case of each owner the lands needed for right of way were first taken from those lands classified by the assessor as irrigated, then from the grazing classification, and the balance, if any, from the miscellaneous classification.

The remaining holdings of owners whose lands would not be entirely inundated were then considered. It is difficult to accurately determine which parts of their lands outside of the actual right of way might be purchased by non-affected ranchers and thus remain on the tax rolls. It was found that 7 of the affected owners have either operating units completely outside the area or own grazing lands of considerable extent in compact tracts. It was assumed that their holdings, over and above the amount actually required for right of way, would not be affected by reservoir construction so far as tax revenues were concerned. In order to arrive at an outside figure of possible loss of tax revenue, it was assumed that the remaining holdings of all other owners whose lands were partially required for right of way would be abandoned.

A summary of the acreage and classification of such lands follows:

	Irrigated acres	Grazing acres	Misc. acres	Total acres
Assessed land required for right of way	3,728	10,103	2,794	16,625
Assessed lands outside of right of way which were considered affected	30	6,970	4,883	11,883
Total	3,758	17,073	7,677	28,508
Total assessed - Gunnison County	35,030	298,866	62,574	396,470

This summary indicates that about 11 percent of the total assessed irrigated land in the county, 6 percent of the grazing lands, and 12 percent of the miscellaneous lands might be affected by the construction of the reservoir.

The corresponding assessed valuations for those owners whose lands would be inundated or considered affected, as taken from the 1950 tax schedules, are shown in the following tabulation. Again, to obtain an outside figure, no attempt was made to estimate the number of cattle which might be relocated in the county and the figures given are on the basis that all livestock and machinery would be lost to assessment. The assessed valuation of the 27 miles of railroad within the reservoir basin is also shown.

	Assessed Valuation
Real Estate and Improvements:	
Assessed land required for R.O.W.	$ 228,760
Assessed land outside of R.O.W. which was considered affected.	19,550
Personal Property on affected lands:	
Livestock	117,940
Farm machinery	28,955
All other	32,325
Less Personal Exemptions	- 7,300
27 Miles of Railroad	709,766
Total	$ 1,129,996
Total Assessments Gunnison County:	
Real Estate & Improvements	$ 4,832,740
Personal Property	2,531,570
Railroads	2,546,500
Other Utilities	375,890
Total for Gunnison County	$ 10,286,700

As indicated by this summary the aggregate of assessed valuations on affected lands and the portion of the railroad which would be inundated amount to about 11 percent of the total assessment of Gunnison County.

To the above valuations there were applied the mill levies for the various county functions in order to ascertain the amount of revenue from ad valorem taxes which might be lost to Gunnison County due to the construction of Curecanti Reservoir. So far as School Districts are concerned, should the reservoir be built there would be no necessity for the continuance of the Iola or Sapinero districts, and there would probably be some reorganization of other districts. However, the figures shown in the following summary represent actual revenue loss without regard to this consideration. For comparison, revenue losses due to railroad inundation have been segregated from those with respect to other affected lands, since it is practically certain that the portion of the railroad between Gunnison and Sapinero will be abandoned whether the reservoir is constructed or not. Railroad valuations have been estimated on a mileage basis using the average per mile value for the county. Consequently there may be some minor errors in the revenue figures shown, but such errors would have a negligible effect on the total analysis.

REVENUES FROM AD VALOREM TAXES

	Lands affected by Reservoir	27 miles of Railroad which would be inundated	Sum
Real Estate, improvements and Personal Property (county purposes)	$ 10,044	$ 16,964	$ 27,008
Gunnison County High School	2,168	3,662	5,830
School Districts No. 1,14,15, 17,20 and 26	3,044	4,989	8,033
Totals	$ 15,256	$ 25,615	$ 40,871

TOTAL COUNTY AND SCHOOL REVENUES FROM AD VALOREM TAXES $ 435,394

Real Estate and Improvements	($ 245,852)
Gunnison County High School	($ 42,895)
All School Districts	($ 146,647)

The summary indicates that the loss in revenue to Gunnison County due to the railroad inundation would amount to 6 percent, and the loss due to the removal from assessment of other lands which would be affected by the reservoir would amount to 3.5 percent of the total county revenue from ad valorem taxes, or a total of about 9.5 percent.

. . . . . .

APPENDIX D

002333

APPENDIX D

STATEMENT PREPARED BY W. A. GROOM, PRESIDENT OF REDLANDS WATER AND POWER COMPANY, BEFORE THE HEARING ON THE CURECANTI DAM IN DENVER, COLORADO, SEPTEMBER 28, 1951

I am representing the Redlands Water and Power Company, being President of their Board. I would like to give a brief summary of our project as a background for our stand on the construction of the Curecanti Dam.

The land irrigated by our ditch lies north and west of Grand Junction in Mesa county between the Colorado River and the Colorado National Monument and below where the Gunnison River empties into the Colorado. Our decree is in the Gunnison river. Our diversion dam is about two miles up the Gunnison. We have a 1906 decree for 610 second feet for power purposes and 60 second feet for irrigation purposes. This water is taken out of the river at our diversion dam and carried down in what we term the power canal to our power plant and pumping stations which is located on the Colorado River west of Grand Junction and about a mile below where the Colorado and the Gunnison come together.

Eight second feet of water has been set aside for irrigation of land adjacent to the power canal, 52 second feet is then pumpted to what we call our lift canals. There are three lifts in this system, the main pumping plant at the power house, No. 1 sub-station and No. 2 sub-station which pump into our second lift, Goat Ranch Ditch and the Hinderlater or third lift ditch. The total lift of these three lifts is about 125 feet.

The 610 feet appropriated for power purposes is run through a 1300 kilowatt generator. Under normal conditions and with a full head of water this generator will supply more power than is needed to run the pumps at the three pump stations.

We have a 25 year contract which has 22 years to run for the sale of all our surplus power. During the non-irrigation season all our water is run through the generator for power production. The sale of this power pays nearly 50% of the entire operating cost of our system.

At the present time we are supplying water for about 3500 acres of land. About 25% of this is in peaches, about 25% in small tracts used for suburban homes and the balance in general farm crops. There is approximately 1000 acres that could be irrigated under our lift canals, that are not now irrigated, if we could supply the water. The area on the east side of our project close to Grand Junction is being subdivided into acre tracts for building lots and we anticipate a large development along this line in the near future. The best figures that we have are that it will take about 50% more water to irrigate these suburban acres than it would if the land was in general crops. We have enough water decreed for irrigation but during the latter part of the irrigation season we are generally short of power water.

I have a table attached showing the amount of water we have been short since 1934. This table shows total acre feet by month that the Gunnison River lacked in supplying our demands at our diversion dam. These figures were taken from the U.S.G.S. water supply papers.

This shows that only one year in the last 17 that we were not short of water at any time. It shows that from 1934 to 1940 inclusive we were extremely short in July, August and September, which are critical months for irrigation.

1941 to 1949 inclusive we had a pretty good river with nearly enough water. In 1950 we were short in the critical months and while the U.S.G.S. figures are not available at this time for 1951, our records show a greater shortage than in 1950.

This shortage of water causes us to buy power for pumping as there is always enough water in the river for our irrigation needs. During the 1934-1940 period we were seriously handicapped as at that time the Public Service Company did not have power available for us to buy. Prior to 1949 we were distributing power to our members for domestic use and we do not have figures that show the actual amount of power purchased for pumping in this period.

In 1949 we sold our distribution lines to the Public Service Company and now we are only operating the power plant and irrigation system.

In 1949 we spent $418.84 for pumping, in 1950 we spent $2,087.60 for power and to the first of September 1951 we have spent $1,502.04 and we have been drawing heavily on power all this month with prospects of a large power bill for October so our total power cost of 1951 will be well over $2,000.00.

We are very much in favor of the construction of the Curecanti Dam as we believe this construction will firm up the Gunnison River and eliminate the periods of the year when we are short of water and also eliminate the extremely high water periods that endanger our diversion dam and canal bank adjacent to the river and diversion dam.

What we need is an ample uniform supply of water in the Gunnison River. In order to take care of the future development of our community and supply water to the additional land we should have an additional 50 second feet appropriated for power purposes.

Studying the flow charts of the river indicates that our dry and wet years run in eight to ten year cycles and we feel with the large storage capacity of the Curecanti Dam would carry the river over the critical dry cycles.

REDLANDS WATER & POWER CO.
Grand Junction, Colo.

Difference between the combined flow of the Gunnison River and Redlands Canal and * decree of Redlands Water & Power Company.

Taken from U. S. G. S. Water Supply Papers-
Shortage each month by acre feet

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1934			2,542	5,311		16,017	31,279	31,599	24,091	24,699	10,291		145,829
1935	1,448	1,671	98	4,644				270	3,367			169	11,667
1936		473		1,094			347	1,436	3,318				6,668
1937	238						3,717	15,014	8,611	627			28,207
1938		194						1,981					2,175
1939							10,473	8,192	1,459	20		246	20,390
1940	175			486			11,546	13,151	4,722			95	30,175
1941	257							365	347				969
1942								79	8				87
1943													0
1944									87				87
1945		293							947				1,240
1946							755	780	400				1,935
1947	20		56	108									184
1948								127	674				801
1949	932								14			26	972
1950							761	5,018	4,017				9,796

The following amounts are for power purchased for irrigation pumping purposes of The Redlands Water & Power Company during periods when there was insufficient power water during 1950.

July $368.58 August $1006.05 Sept. $700.92 Oct. $12.05 Total $2,087.60

* The Redlands Water & Power Co. decree is: Power Water 610 c.f.s.
Irrigation 60 c.f.s.

APPENDIX E

APPENDIX E

002337

MEMORANDUM
December 10, 1951

To: Policy and Review Committee, Gunnison River Storage

From: R. M. Gildersleeve

Subject: Storage possibilities on Gunnison River which might inundate a portion of Black Canyon National Monument

With respect to a study of storage possibilities on the Gunnison River below Black Canyon National Monument, it was found that adequate topographic maps are not available for the river section between the Monument and the Whitewater Reservoir Site. Although the area has been recently photographed, the preliminary topographic sheets will not be available until the fall of 1952.

However, there is an old topographic and irrigation map of the Uncompahgre Valley Project, published by the U. S. Geological Survey in 1905-06, with a contour interval of 50 feet, which includes the Gunnison River and mesa lands between the mouth of the North Fork and the Gunnison Tunnel. It is noted on the map that the topography for this portion is taken from reconnaissance surveys only. A map dated 1950 has also been published by the same agency, which covers the Black Canyon of the Gunnison National Monument only. This map has a contour interval of 40 feet.

Although there are apparent discrepancies between the contours as shown on the two maps for corresponding points within the Monument, it is believed that measurements made on the old map will furnish a good indication of optimum storage possibilities in the river basin directly below the Monument.

The Austin or Nado dam site is about 3/4 mile above the mouth of the Smith Fork. A geologic profile at this point indicates that the inner gorge of the river is a good site for a dam not more than 300 feet in height. Such a dam would impound approximately 110,000 acre feet and would back water about 2 miles inside the Monument. It does not appear from the map that there is any other practicable dam site between the Smith Fork and the town of Delta.

The slope on either side of the canyon between the inner and outer gorges at this site is comparatively flat, rising about 1 foot vertically in 4 to 5 feet horizontally. The rock also changes from granitic to a sandstone and shale formation above the lip of the inner gorge. An increase in height of the dam would result in a disproportionate increase in crest length, and the formation would not be suitable for more than a nominal height increase.

However, in order to explore the full possibilities of the reservoir basin, it was determined than a dam rising 500 feet above the river at the site would be capable of storing about 460,000 acre feet, backing water more than 3 miles beyond the west boundary of the Monument.

The inner gorge progressively increases in depth upstream from the Nado site toward the Monument. However, movement of the site upstream would also result in a progressive loss of the comparatively wider portion of the reservoir basin.

To illustrate this point, it was found that a 500 foot dam just below the next major tributary upstream from Smith Fork would impound some 405,000 acre feet of water, and a dam of that height at the west boundary of the Monument would permit storage of approximately 170,000 acre feet.

Such a dam would be 25 feet higher than the proposed dam at the Blue Mesa site, and in fact would be among the highest in the United States. In contrast, the storage capacity of the reservoir basin above it would be relatively minor.

APPENDIX F

U. S. BUREAU OF RECLAMATION APPENDIX F

Region 4

SALT LAKE CITY 10, UTAH

December 12, 1951

Mr. Clifford H. Stone, Chairman
Policy and Review Committee - Gunnison
River Storage
212 State Office Building
Denver, Colorado

Dear Mr. Stone:

On September 28, 1951, at the first meeting of the State of Colorado Policy and Review Committee considering Gunnison River storage problems, a request was made for special study by the Bureau of Reclamation of five items of specific interest to the Committee.

We are pleased to present the enclosed material in compliance with that request. Representatives from our Salt Lake and Grand Junction offices will be present at the Denver meeting of the Committee on December 14-15, 1951, and can be called upon for further assistance should you so desire.

Very truly yours,

/s/ E. O. Larson
E. O. Larson
Regional Director

Enclosure (1)

* * * * * * * * * * *

Question 1: What is the relative feasibility of placing a part or all of the proposed Curecanti storage at other sites in the Gunnison River Basin?

Several possibilities exist for alternative storage in the Gunnison Basin. By building a higher dam (up to 600 feet) at Crystal, the content of Crystal Reservoir could be increased to a maximum of 510,000 A.F., of which 425,000 A.F. would be active storage. Other storage sites above Curecanti also might be used to replace some of the capacity presently planned for Curecanti. The most favorable of these upstream sites are Gateview Dam and Reservoir on Lake Fork, and an enlarged Taylor Park Reservoir. Summarized data indicating the feasibility of replacing part of Curecanti storage at these other sites is presented in the table on page 3. Three plans using the above sites consist of the following:

Plan A - same as the Colorado River Storage Project plan --		
	Curecanti	2,500,000 A.F.
	Crystal	40,000 A.F.
	Whitewater	880,000 A.F.
Plan B -	Curecanti	1,935,000 A.F.
	Crystal	510,000 A.F.
	Whitewater	880,000 A.F.
Plan C -	Curecanti	940,000 A.F.
	Crystal	510,000 A.F.
	Whitewater	880,000 A.F.
	Taylor Park	760,000 A.F.
	Gateview	308,000 A.F.

Another alternative, including a dam at the Almont site, was considered but was found to be more costly than the sites shown in the accompanying table.

Referring to the table, page 3 it will be noted that the only increased service from alternative plans is added generation of electric energy. Added generation, however, is accompanied by excessive costs. Since the only additional service is increased generation, all additional costs were charged to power, and the cost per kwh of additional power varies from 13 to 22 mills.

A dam site called the County Line site exists on the Gunnison River a short distance below Curecanti at the Gunnison-Montrose County line. (See river profile, page 4.) A dam at this site would limit the size of Crystal to the 300-foot height originally planned, and would inundate the canyon upstream to the lower end of the Gunnison meadows. Since either the combination of a 940,000 A.F. Curecanti and 510,000 A.F. Crystal or 1,590,000 A.F. County Line and 40,000 A.F. Crystal utilized the full head between Crystal dam site and the lower end of Gunnison Meadows, energy generation would be practically the same with either combination. Cost of power plant and transmission facilities would likewise be almost identical.

Estimated cost of dams and control works for 940,000 A.F. Curecanti and 510,000 A.F. Crystal is:

Curecanti	$ 44,000,000
Crystal	82,400,000
Total	$126,400,000

Estimated cost of dams and control works for 1,590,000 A.F. County Line and 40,000 A.F. Crystal is:

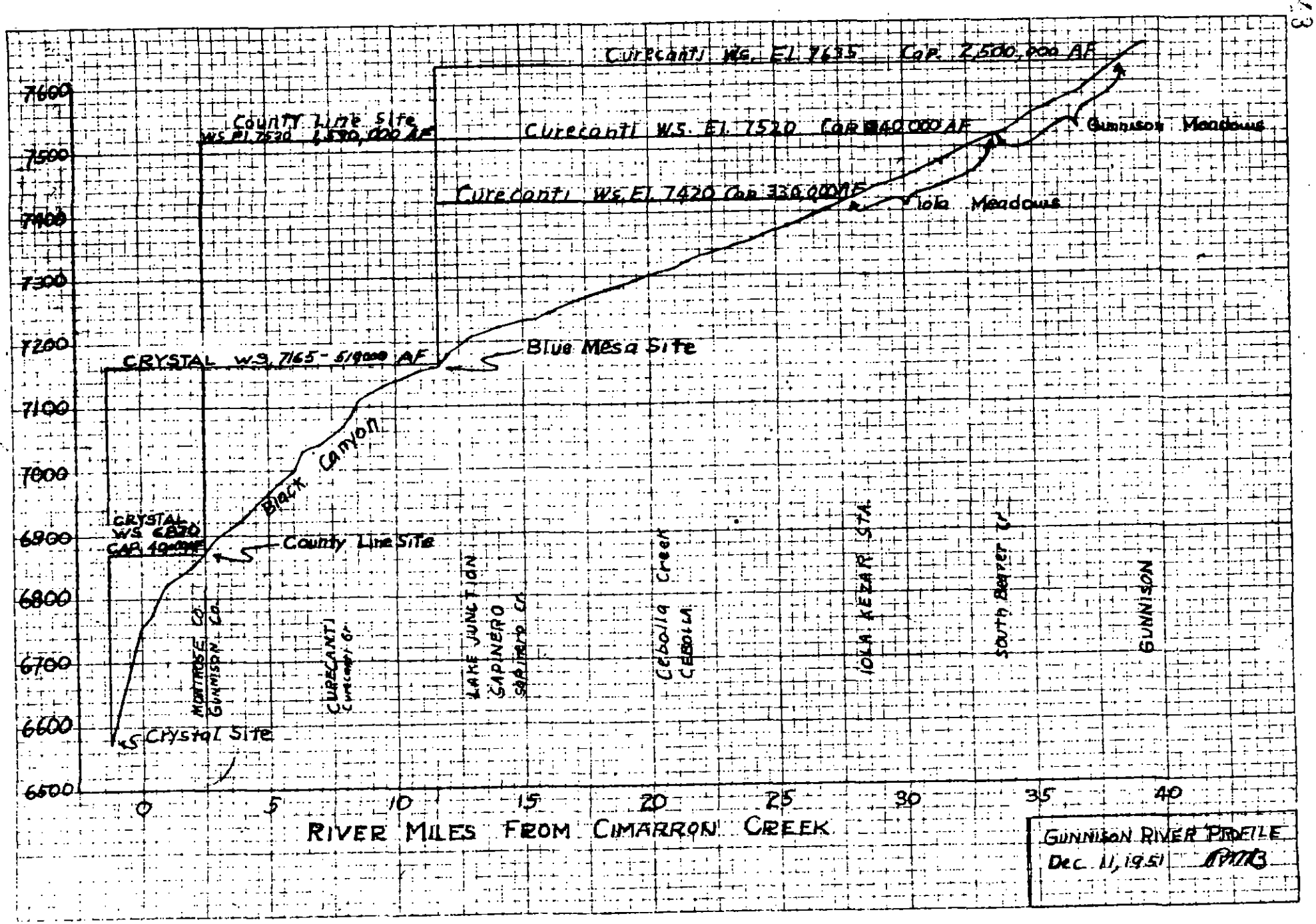
County Line	$175,000,000
Crystal	25,900,000
Total	$200,900,000

This wide variation in cost for essentially the same storage facilities and energy production eliminates this alternative from further consideration.

Question 1

Comparative Statistics of Alternative Plans

Item	Units	Plan A	Plan B	Plan C
Reservoir Active Storage				
Curecanti	1,000 AF	2,010	1,585	765
Crystal	" "	0	425	425
Whitewater	" "	470	470	470
Taylor Park	" "	0	0	565
Gateview	" "	0	0	255
TOTAL	" "	2,480	2,480	2,480
Power Plants				
Installed Capacity	Kw	156,000	190,000	184,000
Salable Energy (initial)	Million Kwh/year	839	1,023	980
Salable Energy (Year 75)	" "	504	639	636
Increase over Bureau Plan (initial)	" "	0	184(21.9%)	141(16.8%)
Increase over Bureau Plan (Year 75)	" "	0	135(26.8%)	132(26.2%)
Estimated Construction Cost				
Dams & Reservoirs	$1,000	117,500	167,442	179,445
Power Plants	$1,000	21,940	24,603	25,486
Transmission System	$1,000	21,080	25,670	24,860
TOTAL	$1,000	160,520	217,715	229,791
Increase over Bureau Plan	$1,000	0	57,195 (35.6%)	69,271 (43.1%)
Cost of Additional Energy				
Annual Increase, O&M & Repl.	$1,000	0	191.5	264.1
Annual Increase, Amortization cost	$1,000	0	2,223.2	2,692.6
Total Increase, Annual Cost	$1,000	0	2,414.7	2,956.7
Cost of Increased Energy (Initial)	Mills/Kwh	--	13.1	21.0
Cost of Increased Energy (Year 75)	Mills/Kwh	--	17.9	22.4


Curecanti WS. El. 7635 Cap. 2,500,000 AF
County Line Site
WS El. 7530 4,530,000 AF
Curecanti W.S. El. 7520 Cap 440,000 AF
Gunnison Meadows
Curecanti WS. El. 7420 Cap 330,000 AF
Iola Meadows
CRYSTAL W.S. 7165 - 519000 AF
Blue Mesa Site
Black Canyon
CRYSTAL
WS 6820
CAP 49,000 AF
County Line Site
Crystal Site
MONTROSE CO.
GUNNISON CO.
CURECANTI
LAKE JUNCTION
GAPINERO
CEBOLLA Creek
CEBOLLA
IOLA KEZAR STA.
South Beaver Cr.
GUNNISON
7600
7500
7400
7300
7200
7100
7000
6900
6800
6700
6600
0
5
10
15
20
25
30
35
40
RIVER MILES FROM CIMARRON CREEK
GUNNISON RIVER PROFILE
Dec. 11, 1951

Question 2: What is the relative effect of decreased storage capacity in the Curecanti Reservoir on power production of Gunnison River units of the Colorado River Storage Project?

The following table indicates the power potential of the Gunnison River with various sizes of Curecanti.

MEAN ANNUAL ENERGY GENERATION

Units: Million kwh

	Curecanti 2,500,000 af		Curecanti 1,935,000 af		Curecanti 940,000 af		Curecanti Eliminated	
	Initial	Ultimate	Initial	Ultimate	Initial	Ultimate	Initial	Ultimate
Curecanti	327.9	196.1	298.5	173.2	224.7	139.3		
Crystal	284.1	176.6	277.8	175.0	243.7	158.1	189.0	145.0
Whitewater	290.0	169.6	288.8	168.0	274.7	156.1	245.6	152.5
Total	902.0	542.3	865.1	516.2	743.1	453.5	434.6	297.5

It will be noticed that the amount of energy generated at each unit increases with the size of Curecanti Reservoir. This increase results from two factors: (1) The larger sizes of Curecanti release more water from storage to supplement the low flows of the stream flow period and (2) the larger sizes of Curecanti are more capable of controlling the river and eliminating waste from spills at the downstream plants.

Question 3: What is the amount of regulatory storage required at the Curecanti Reservoir site to facilitate full irrigation development in the Gunnison River Basin from its mouth to the headwaters?

- - -

The capacity needed at Curecanti to facilitate full irrigation development in the Gunnison Basin will depend on the amount and location of future use which is permitted and the manner in which Taylor Park is operated. The storage required to facilitate irrigation use in the Gunnison Basin is shown below. The operation to provide this assistance is subject to 4 general assumptions: (1) no allowance was made for a diversion to the Arkansas Basin, (2) a demand on Whitewater to replace water now being applied to Grand Valley from the Colorado River was not considered, (3) full irrigation development was assumed to include all the projects listed in the Gunnison River Report of February 1951 (the Jex Report) and also assumed full operation of the water-use project reservoirs listed in that report, (4) the run-off pattern in the future will be no worse than that which occurred between 1931 and 1940. Under the above assumptions the following two studies were made:

1. Capacity required at Curecanti assuming full irrigation use without shortage and assuming that Taylor Park would be operated only to facilitate irrigation in the Uncompahgre Valley . . . . . 84,000 a.f.

2. Capacity required at Curecanti assuming a 50% shortage * in irrigation supply for future irrigation projects and assuming that Taylor Park would be operated to facilitate irrigation only in the Uncompahgre Basin . . . . . 49,000 a.f.

It should be noted that the storage required under Study No. 1 was necessary largely to supply water for only one month of the driest year of record. It is doubtful if storage to supply such a demand could be economically justified. The graph on the following page will show the need for storage at Curecanti during the drought decade 1931-1940. If future water use throughout the basin were curtailed by 50% in 1934 and in 1931, the maximum storage requirement for full irrigation development would be practically eliminated except for one month. If permission could be obtained from the Uncompahgre Valley Water Users to utilize excess storage in Taylor Park, even shortages such as occurred in 1931 and 1934 could be alleviated In general, then, it can be said that appreciable storage at Curecanti to facilitate full irrigation development in the Gunnison Basin is necessary for only one month of a 10-year period and for that reason probably could not be economically justified. The water use reservoirs included in the Gunnison River Report could assure nearly a full irrigation supply and in years of short supply coordinated operation of these reservoirs with the operation of Taylor Park could probably assure nearly a full supply for all lands with only minor shortages.

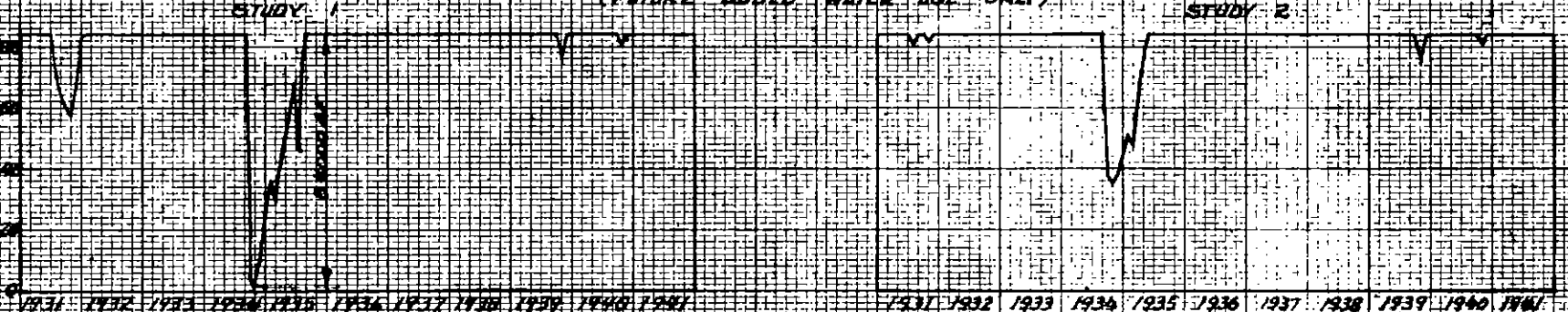
* 50% shortage in 2 years out of 10. No shortage remaining 8 years.

STORAGE REQUIREMENTS

For La Basin Irrigation Use

COACHELLA

(FUTURE ADDED WATER USE ONLY)



TAYLOR PARK

TO MEET EXISTING DEMANDS

Question 4: What amount of storage and at what location is storage needed to provide a firm water supply for potential industrial development in the Gunnison River Basin?

- - -

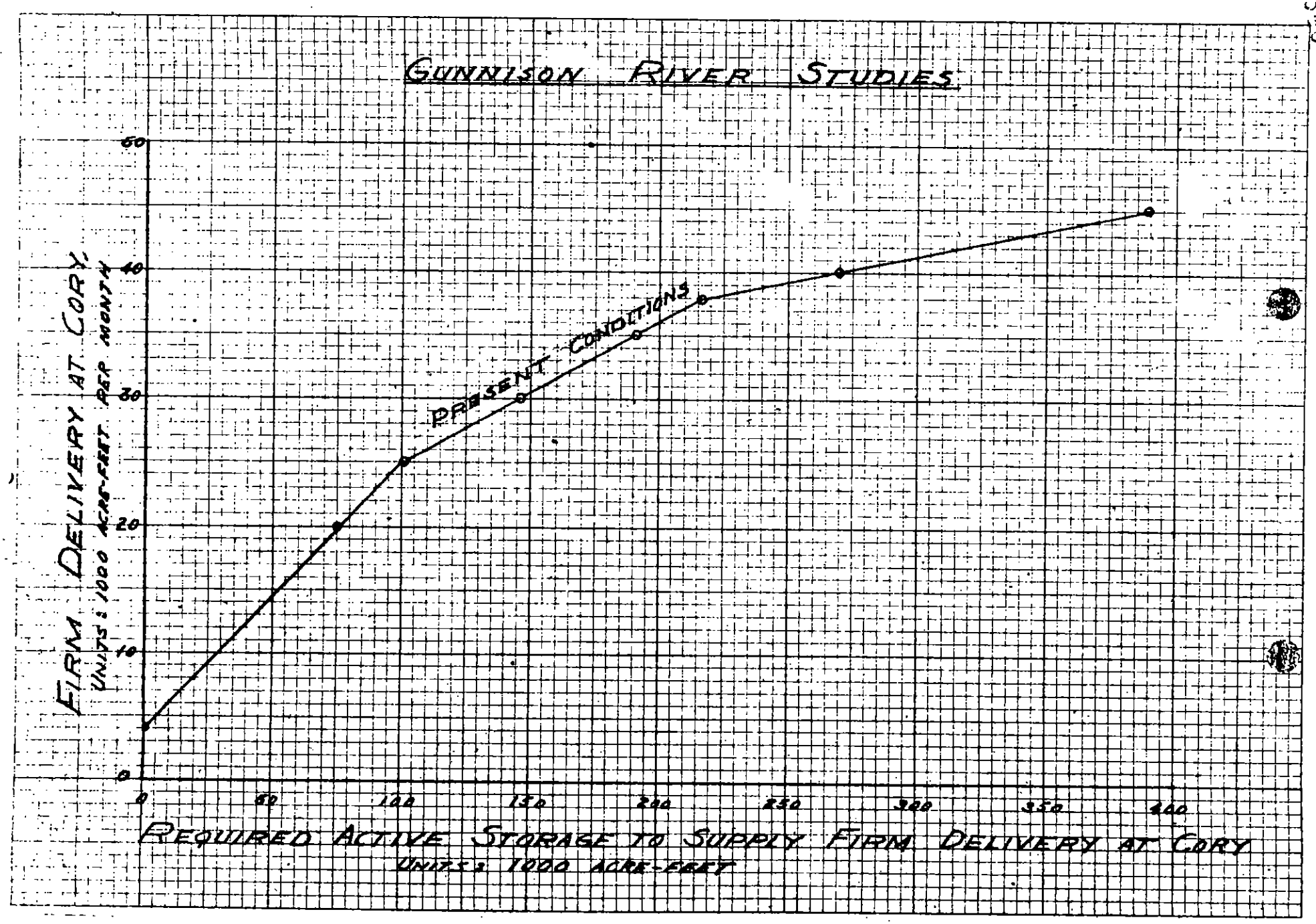
Our study of this question has assumed that future industrial development in the Gunnison Basin will most logically take place near Cory, just below the mouth of the North Fork where advantage can be taken of the combined flows of both of the main branches of the Gunnison River. An upstream reservoir to assure a firm supply for this purpose would need be located at a point where adequate control of stream flows can be provided. The Gunnison River proper appears to offer the best prospective sites at this time. Two such sites would be the Nado (Austin) site and the Curecanti site. The Curecanti site was selected because pertinent information was more readily available. There would be little difference in the storage requirements of the two sites.

The study was based on stream flows reflecting only present development conditions in the basin. The storage requirement indicated for this purpose is thus in addition to any storage required for other types of new uses of Gunnison River water.

The amount of water passing Cory which is needed for irrigation use downstream is very small and difficult to evaluate exactly, so only the firm delivery at Cory has been shown. Since the downstream irrigation demand is small, the Cory firm delivery is, for all practical purposes, identical to the amount available for industrial use.

The curve on the following page shows the size of a reservoir at Curecanti required to assure various firm deliveries at Cory.

GUNNISON RIVER STUDIES



Question 5: What would be the effect on the Colorado River Storage Project plan if proposed hold-over storage capacity at the Curecanti site were reduced or eliminated?

- - -

As is pointed out in the Colorado River Storage Project report, a regulatory reservoir system consisting of ten reservoirs was designed to provide a total of 23,000,000 acre-feet of regulatory capacity. Bureau of Reclamation studies indicate a regulatory storage requirement of that amount in connection with the full use of the water alloted to the Upper Basin. The effect, therefore, of eliminating or reducing the 2 million acre-feet of regulatory storage planned for Curecanti Reservoir would result in a requirement for substitution of an equal amount of storage at some other point within the Upper Colorado River basin.

The Curecanti Reservoir from several aspects is one of the most favorable points of regulatory control in the Upper Colorado River Basin system. Its characteristics with respect to evaporation are exceedingly attractive. To acquire an equal amount of capacity at alternative sites in the Upper Colorado River basin could be accomplished only at the cost of additional evaporation losses. This of course, would result in an equal loss of water for use by the Upper Basin for beneficial consumptive purposes.

APPENDIX G

PRINCIPAL RESERVOIR SITES OF THE UPPER GUNNISON BASIN

Appendix G

Reservoir	Location: Stream	Sec.	Twp.	Range	Capacity A.F.	Cost * Dec. 1949	Unit Cost $/AF	Elevation: Damsite	W. S.	Irrig. Land Innundated	Source of Data
Curecanti 1/ (Blue Mesa)	Gunnison R.	4- 5	48N	4W	2,500,000	67,881,000	27	7165	7635	720	CRS Proj. Report
Alpine 2/	Blue Cr.	13-24	46N	5W	10,000	1,674,000	167	9500	9650	--	Gun.B.Rep.
Gateview 3/	Lake Fork	17	47N	3W	133,000	10,092,000	76	7737	7980	240	G.J.Recon.
Gates 3/	Lake Fork	7	46N	3W	212,000	26,076,000	123	7980	8300	200	" " "
Independence 3/	Lake Fork	2	44N	4W	64,000	3,613,000	57	8430	8640	620	" " "
Cebolla (Powell) 4/	Cebolla Cr.	36	48N	3W	55,000	10,740,000	195	7695	7905	--	Pueblo Off.
Cebolla 5/	Cebolla Cr.	11	44N	2W	29,000	2,165,000	74			560	USGS Rep. by Follansbee
Castle 2/	Ohio Creek	10	15S	87W	10,000	2,496,000	250	9250	9385	--	Gun.B.Rep.
Hinckle 3/	Ohio Creek	33	15S	86W	21,000	2,418,000	115	8210	8310	1700	G.J.Recon.
Gunnison No.3 3/	Gunnison River	27	51N	1E	86,000	5,547,000	65	7986	8175	765	" " "
Almont 4/	Taylor River	32	15S	84W	385,000	89,707,000	233	8175	8590	960	Pueblo Off.
Taylor Park 4/	Taylor River	24	14S	83W	750,000	19,870,000	26	9165	9500	--	" "
Lower Cochetopa 3/	Cochetopa Creek	33	48N	2E	2,900	749,000	258			80	G.J.Recon.
Upper Cochetopa 3/	" "	33	47N	2E	36,000	1,858,000	52			1000	" " "
Lower Los Pinos 3/	Los Pinos Creek	3	45N	1E	15,000	1,739,000	116	9175	9300	240	" " "
Banana Ranch 2/	Cochetopa Creek	5- 8	44N	2E	20,000	2,330,000	116	9570	9740	--	Gun.B.Rep.
Ohio City 2/	Quartz Creek	26	50N	3E	30,000	5,835,000	194	8480	8620	720	" " "
Pitkin 5/	Quartz Creek	2	50N	4E	6,000	950,000	158			--	USGS Rep. by Follansbee
Parlin 4/	Tomichi Cr.	24-25	49N	2E	2,550,000	55,350,000	22	7945	8300	1280	Pueblo Off.
Upper Razor 3/	Razor Cr.	31	48N	3E	1,500	611,000	407			150	G.J.Recon.
Needle 3/	Needle Cr.	5	47N	4E	1,000	638,000	638			--	" " "
Sargents No. 4 4/	Tomichi Cr.	21	48N	5E	50,000	6,640,000	133	8375	8560	1100	Pueblo Off.
Total & Average					6,967,400	318,979,000	46				

1/ Includes only the cost of dam and reservoir, power plant costs are not considered.
2/ Cost estimates were prepared by use of "Project Planning Estimating Data" from damsite topography taken by Bureau forces.
3/ Cost estimates were prepared by use of "Project Planning Estimating Data" from reconnaissance reservoir topography and damsite profiles made by Bureau forces and use of U.S.G.S. River Sheets. The cost of Gateview development was estimated from topography taken by the Pueblo Office.
4/ Taken from cost estimates prepared for the appendices of the Gunnison-Arkansas Project by the Pueblo Office and the Chief Engineer's Office.
5/ Cost estimates were prepared by use of "Project Planning Estimating Data" based on damsite profiles as reported by Follansbee from the U.S.G.S.

002352

APPENDIX H

002353

APPENDIX H

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Region 4
Post Office Box 360
Salt Lake City 10, Utah

January 24, 1952

Judge Clifford H. Stone, Chairman
Policy and Review Committee-
Gunnison River Storage
212 State Office Building
Denver 2, Colorado

Dear Judge Stone:

At the December 14, 1951 meeting of the Policy and Review Committee - Gunnison River Storage, the Region 4 office of the Bureau of Reclamation presented certain data in answer to five questions asked by the Committee during its September 28, 1951 meeting. Some members of the Committee, however, requested that Question 1 be explored more fully and extended to include three additional combinations designated plans D, E and F.

For your ready reference there follows a statement of "Question 1" with a summary of the features involved in plans A to C previously presented and the features of the added plans designated D, E and F.

Question 1: What is the relative feasibility of placing a part or all of the proposed Curecanti storage at other sites in the Gunnison River Basin?

		Total Storage	Active Storage
Plan A	(Same as the Colorado River Storage Project plan)		
	Curecanti	2,500,000 A.F.	2,010,000 A.F.
	Crystal	40,000 A.F.	0 A.F.
	Whitewater	880,000 A.F.	470,000 A.F.
	Total	3,420,000 A.F.	2,480,000 A.F.
Plan B	Curecanti	1,935,000 A.F.	1,585,000 A.F.
	Crystal	510,000 A.F.	425,000 A.F.
	Whitewater	880,000 A.F.	470,000 A.F.
	Total	3,325,000 A.F.	2,480,000 A.F.

		Total Storage	Active Storage
Plan C	Curecanti	940,000 A.F.	765,000 A.F.
	Crystal	510,000 A.F.	425,000 A.F.
	Whitewater	880,000 A.F.	470,000 A.F.
	Taylor Park	760,000 A.F.	565,000 A.F.
	Gateview	308,000 A.F.	255,000 A.F.
	Total	3,398,000 A.F.	2,480,000 A.F.
Plan D	Curecanti	330,000 A.F.	0 A.F.
	Taylor Park	300,000 A.F.	235,000 A.F.
	Crystal	510,000 A.F.	425,000 A.F.
	Gateview	308,000 A.F.	255,000 A.F.
	Whitewater	880,000 A.F.	470,000 A.F.
	Total	*2,328,000 A.F.	1,385,000 A.F.
Plan E	Curecanti	940,000 A.F.	765,000 A.F.
	Whitewater	880,000 A.F.	470,000 A.F.
	Crystal	510,000 A.F.	425,000 A.F.
	Total	*2,330,000 A.F.	1,660,000 A.F.
Plan F	Curecanti	330,000 A.F.	0 A.F.
	Whitewater	880,000 A.F.	470,000 A.F.
	Crystal	510,000 A.F.	425,000 A.F.
	Total	*1,720,000 A.F.	895,000 A.F.

* The remaining capacity required to bring the total of these combinations to a base comparable with the Bureau plan (total active capacity of 2,480,000 acre-feet) would be placed in the most favorable sites elsewhere in the Colorado River Basin in the State of Colorado.

The table which follows is an extension of the table appearing on page 3 of my letter of December 12. The new table indicates the results of all studies (Plans A to F) under question 1.

In reviewing the situation at the Taylor Park Reservoir with respect to its enlargement within a reasonable cost (Plan D) a total capacity of 300,000 acre feet was studied first. This would provide a new capacity of 194,000 acre feet. An enlargement to that extent, however, was found lacking in financial feasibility as a unit of the Colorado River Storage Project. From this one study it was very apparent that economic control of the Taylor River exclusive of any imported waters could be accomplished by an enlargement of the Taylor Park Reservoir to an insignificant amount with respect to the replacement of the storage capacity at the Curecanti site. Plan D was therefore pursued no further. Data in Table I under Plan D corresponds to an enlargement of Taylor Park Reservoir to a total capacity of 300,000 acre feet and was included for relative comparative purposes only.

TABLE I

QUESTION 1

Comparative Statistics of Alternative Plans

Item	Units	Plan A	Plan B	Plan C	Plan D	Plan E	Plan F
Reservoir Active Storage							
Curecanti	1,000 a.f.	2,010	1,585	765	0	765	0
Crystal	1,000 a.f.	0	425	425	425	425	425
Whitewater	1,000 a.f.	470	470	470	470	470	470
Taylor Park	1,000 a.f.	0	0	565	235	--	--
Gateview	1,000 a.f.	0	0	255	255	--	--
Total	1,000 a.f.	2,480	2,480	2,480	1,385	1,660	895
Power Plants							
Installed Capacity	Kilowatts	156,000	190,000	184,000	175,500	173,000	149,000
Salable Energy (initial)	Million kwh/year	839	1,023	980	855	914	715
Salable Energy (Year 75)	Million kwh/year	504	639	636	572	566	511
Increase over Bureau Plan (initial)	Million kwh/year	0	184 (21.9%)	141 (16.8%)	16 (1.9%)	75 (8.9%)	-124 (-15%)
Increase over Bureau Plan (Year 75)	Million kwh/year	0	135 (26.8%)	132 (26.2%)	68 (13.5%)	62 (12.3%)	7 (1.4%)
Estimated Construction Cost							
Dams & Reservoirs	$1,000	117,500	167,442	179,445	153,956	150,442	132,066
Power Plants	$1,000	21,940	24,603	25,486	23,921	23,055	22,780
Transmission System	$1,000	21,080	25,670	24,860	23,713	23,375	22,970
Total	$1,000	160,520	217,715	229,791	201,590	196,872	177,816
Increase over Bureau Plan	$1,000	0	57,195 (35.6%)	69,271 (43.1%)	41,070 (25.6%)	36,352 (22.6%)	17,296 (10.8%)
Cost of Additional Energy							
Annual Increase, O&M & Replacement	$1,000	0	191.5	264.1	213.7	97.6	71.4
Annual Increase, Amortization Cost	$1,000	0	2,223.2	2,692.6	2,466.7	2,064.8	1,931.9
Total Increase, Annual Cost	$1,000	0	2,414.7	2,956.7	2,680.4	2,162.4	2,003.3
Cost of Increased Energy (Initial)	Mills/kwh	--	13.1	21.0	168.0	28.9	*
Cost of Increased Energy (Year 75)	Mills/kwh	--	17.9	22.4	39.5	34.9	286.0

* This plan results in an increase in annual costs accompanied by a decrease in initial energy generation.

Table I shows conclusively that none of the alternative plans considered under Question 1 on the Gunnison River are suitable substitutes for the large Curecanti Reservoir. Also plans E and F are even less attractive than the former alternative plans B and C.

Plans D, E and F would not provide complete substitution of capacity on the Gunnison River for the capacity losses at Curecanti. The minutes of the December 14, 1951 meeting indicate that the remaining substitute capacity should be obtained at sites on tributaries other than the Gunnison preferably in Colorado. Rather than establish new reservoirs for this purpose, consideration should first be given to increasing the height of one or several of the proposed dams included in the Colorado River Storage Project on other tributaries since these dams and reservoirs are at the most attractive sites in the Upper Colorado River System. Such a proposition would require a great amount of detailed study which can only be undertaken in connection with the preparation of definite plan reports each requiring specific authorization.

However, there is included herewith, for the use of the Committee, Table II summarizing various unit costs of storage capacities, unit costs of power installations, relative evaporation charges and losses due to sedimentation at the ten units proposed under the Colorado River Storage Project plan. At the bottom of Table II is shown the average unit costs and charges for the ten-unit system. Also for purposes of comparison there are shown the average unit costs and charges of the three-unit combination on the Gunnison River (Curecanti, Crystal and Whitewater) as proposed under the Colorado River Storage Project plan. There are also shown at the bottom of Table II similar unit costs and charges for Curecanti Reservoirs with capacities reduced to 940,000 acre feet and 330,000 acre feet, respectively.

You will readily note from Table II that costs of capacity and power installation at each of the three units on the Gunnison River are among the highest in the 10-unit system. You will note that a reduction in the capacity at the Curecanti site occasions substantial increases in its unit costs. On the other hand, the Gunnison River units, with the exception of the Whitewater Unit, are very favorable with respect to evaporation and sedimentation. Therefore, the general conclusion is that a substitution of any part of the active storage capacity of Curecanti Reservoir at Glen Canyon, Echo Park, Cross Mountain or Flaming Gorge may result in a slight saving in the total cost of the Colorado River Storage Project, but, such a saving could be attained only through a sacrifice of water due to increased losses by evaporation.

TABLE II

Unit	Dollars Allocated to Irrigation per Acre-foot Assured 200-Year Active Capacity	Dollars Allocated to Power per Kilowatt Installed	Acre-feet Initial Annual Evaporation per 1,000 Acre-feet Initial Total Capacity	Acre-feet Year 200 Annual Evaporation per 1,000 Acre-feet Year 200 Active Capacity	Acre-feet Annual Sediment Deposit Year 20 per 1,000 Acre-feet Initial Total Capacity	Percent Reduction in Active Capacity by Sediment Deposited in 200 Years
Cross Mountain	6.05 (1)	443.33 (2)	11.94 (4)	17.37 (3)	0.29 (2)	4.1 (2)
Crystal	-	789.58 (9)	Negligible (1)	-	Negligible	-
Curecanti (2,500,000 a.f.)	20.76 (5)	729.07 (7)	11.60 (3)	16.17 (1)	0.12 (1)	1.5 (1)
Echo Park	13.84 (3)	469.25 (3)	9.75 (2)	16.83 (2)	0.39 (3)	5.3 (3)
Flaming Gorge	16.36 (4)	569.03 (4)	13.96 (5)	21.96 (5)	1.78 (4)	13.6 (4)
Glen Canyon	6.88 (2)	364.98 (1)	21.10 (8)	50.31 (8)	2.97 (7)	47.7 (7)
Gray Canyon	64.91 (8)	633.76 (5)	15.00 (6)	42.98 (6)	3.50 (8)	49.8 (8)
Navajo	38.51 (7)	1157.66 (10)	15.85 (7)	21.80 (4)	1.83 (5)	30.1 (5)
Split Mountain	-	764.00 (8)	23.88 (9)	-	Negligible	-
Whitewater	26.63 (6)	652.50 (6)	27.30 (10)	64.41 (7)	2.61 (6)	30.6 (6)
10 Units Average	12.84	497.00	16.90	32.61	2.06	30.9
Gunnison R. Units (Curecanti, Crystal & Whitewater) Average	21.59	723.93	15.50	22.99	0.76	7.1
Curecanti (940,000 a.f.)	28.94	817.50	13.83	17.50	0.32	2.9
Curecanti (330,000 a.f.)	-	1078.58	21.20	-	0.91	-

(1) Denotes order of magnitude.

An evaluation of these slight savings and added evaporation losses would require detailed economic height determinations at each dam site involving considerations of efficiency of streamflow regulation and hydro power production. These detailed studies must await Congressional approval of the project plan, and also authorization and appropriations for investigations pertaining to the definite plan reports. The data furnished herewith, however, are quite conclusive and should offer sufficient information for the Committee's use with respect to Question 1.

Very truly yours,

/s/ E. O. Larson
E. O. Larson
Regional Director

APPENDIX I

APPENDIX I

STATEMENT OF R. M. GILDERSLEEVE TO POLICY AND REVIEW COMMITTEE - GUNNISON RIVER STORAGE, FEBRUARY 22, 1952, REGARDING POWER COSTS RELATIVE TO PROPOSED STORAGE UNITS ON GUNNISON RIVER.

The letter of January 24, 1952, from Region 4, Bureau of Reclamation, to the Policy and Review Committee, presents a comparison between various alternative plans of storage on the Gunnison River. In Table I, statistics are given relative to active storage capacities, construction costs, amounts of salable energy, and increases in operation, maintenance and replacement costs for the several plans as compared with Plan A, which, it is stated, is the same as the Colorado River Storage Project plan. That is, Curecanti Reservoir was originally proposed with a total storage capacity of 2,500,000 acre feet, Crystal with 40,000 acre feet and Whitewater with 880,000 acre feet.

Each of the alternative plans, except Plan F, shows an increase over Plan A in total energy generated, together with an increase in construction cost. Table I of the letter lists the resulting annual increases in amortization costs for the different plans, as well as the costs, in mills per kwh, of the increased energy which would be produced. The comparison is adequate to show the costs of such increased energy, but does not indicate the over-all average power costs for Plan A or the alternative plans. Neither does it show what the effect might be on the power costs of the entire Colorado River Storage Project due to the substitution of one of the alternative plans for the original Gunnison River units considered in the project report dated December, 1950.

For any project, the power cost is based on that portion of total construction cost allocated to power purposes. The total costs of power plants and transmission lines are specifically allocated to power. The remaining joint construction costs are then allocated as between power and other purposes by some logical method. The letter of January 24 does not contain information as to the amounts allocated to power for the various plans, over and above the specific power costs for power plants and transmission systems.

Mr. C. B. Jacobson, of Region 4, came to the office of the Colorado Water Conservation Board on February 18, 1952 to explain the methods by which the results shown in Table I were obtained. Mr. R. J. Tipton, Consulting Engineer for the Board, also was present. Data were furnished as to the construction costs of the features for each unit of the plans, the amounts allocated to power and irrigation, and the average costs per kwh of the power generated under each of the plans for the Gunnison River. It was learned that Plan A contains proposed power facilities varying somewhat from those in the report on the Colorado River Storage Project which was submitted to the affected States. It was explained that for the purpose of the comparisons shown in Table I, the allocations to irrigation for each of the alternative plans were based on the cost of active storage for the 2,500,000 acre foot Curecanti Reservoir, which was $20.44 per acre foot. This was done under the theory that there could be no greater allocation to irrigation for any of the units under Plans B to F, than the active storage capacity of the unit in acre feet multiplied by $20.44, since the cheapest available alternative storage was considered to be that which would be furnished by the large Curecanti site. The remaining costs for the units under

the Plans B to F were allocated to power, and the costs of increased power and average power costs for each plan were calculated. The average initial annual power costs were stated to be as follows:

Plan A	6.4	mills	per	kwh
Plan B	7.6	"	"	"
Plan C	8.5	"	"	"
Plan D	9.4	"	"	"
Plan E	8.3	"	"	"
Plan F	10.4	"	"	"

Following this conference, it was decided that the engineering staff of the Colorado Water Conservation Board would make an analysis, showing the effect of substituting in the over-all Colorado River Storage Project the units contained in Plan E, in place of the units for the Gunnison River described in the project report of December, 1950. Allocations as between power and irrigation would be made as nearly as possible on the same basis as they were made in the original project report, just as they would be made if for some reason the larger capacity at the Curecanti site was not available. Plan E was chosen for the analysis because (1) it involves the same storage sites proposed in the original report, (2) it contemplates a material reduction in the area inundated by Curecanti Reservoir, while still furnishing substantial regulatory storage capacity in the Upper Gunnison River Basin, and (3) it has the lowest construction cost of any of the alternative plans which would provide an increase in total energy generation.

It was stated in the report on the Colorado River Storage Project that the total specific power costs of the entire project were allocated to power, and the remaining total joint costs tentatively allocated to power and to irrigation and other water-consuming uses by averaging the results of the priority-of-use and alternative-justifiable-expenditure methods. These total allocations were then distributed between the various units of the project, the distribution of joint costs being in proportion to the regulatory reservoir capacity and the installed generating capacity, respectively, at each unit. The two distributions were then averaged for the adopted cost allocations for each unit. On the basis of the power allocations and total generation given in the report, the initial annual cost of generation for the entire project was computed to be about 4.9 mills per kwh. Based on the combined power allocations and energy generation of the Gunnison River units as stated in the report, the initial average annual power cost for those units was calculated to be 7.1 mills per kwh. This indicates that the change in power features from those of the Gunnison units of the original report to those of Plan A, Table I, has resulted in a revision downward of the average power cost for those units to the 6.4 mills previously mentioned.

Although the exact method used by the Bureau of Reclamation in allocating the joint costs was not exactly determined, a method was developed for the purpose of the analysis, also based on relative regulatory storage capacity and installed generating capacity for each unit, which checked very closely the allocations shown in the original report. This method was then used as

a basis for determining the approximate power allocations which might reasonably be expected in the case of each of the various units of the over-all Colorado River Storage Project, if the Gunnison River units of the original report should be replaced by those of Plan E.

On the basis of the total power allocations thus determined, and considering the increase in total generation as well as in annual operation, maintenance and replacement costs (as shown for Plan E in Table I), the initial annual power cost for the over-all project, with Gunnison River units revised according to Plan E, would be about 5.0 mills per kwh. This would indicate that such a substitution in the over-all storage plan would result in an increase in initial annual power cost of not more than 0.1 mills per kwh over the power cost as calculated from the Colorado River Storage Project report of December, 1950.

Computed from the power allocations thus determined for the combined Gunnison River units of Plan E, the average initial annual power cost would be 7.8 mills per kwh, as compared with the 7.1 mills cost for those units based on the December, 1950 report on the Colorado River Storage Project. As has been previously stated, under the method of allocation used for Table I of the letter of January 24, 1952, the average initial annual power cost for the combined units of Plan E was 8.3 mills per kwh.

APPENDIX J

APPENDIX J

STATEMENTS MADE BY W. R. SEAMAN, COLORADO GAME AND FISH DEPARTMENT, CONCERNING THE EFFECTS OF CURECANTI RESERVOIR ON THE GUNNISON RIVER FISHERIES.

1. The Gunnison River is now providing a good large-stream trout fishery and has attained national recognition as such. The construction of Curecanti Dam will substitute a fluctuating reservoir for a major portion of this fishery.

2. The Gunnison River is now stocked at the rate of over one hundred 7 to 9 inch trout per acre yielding a catch of 0.6 fish per man hour of fishing effort. It is beyond the capabilities of the Game and Fish Department trout production facilities to stock the reservoir at the same rate as the river is now stocked.

3. The trout production of Curecanti Reservoir will be greater than that of the river to be inundated due to the increased water area, however the catch per man hour of fishing effort will probably drop considerably. The average size of the fish caught will probably increase somewhat. The reservoir will be capable of supporting a much greater fishing pressure than the present river.

4. It is the history of fluctuating reservoirs in this state that after initial inundation, a period of 3 to 5 years of good fishing and excellent fish growth ensues. After this initial period is passed, a rapid decline in fishing quality occurs. Curecanti Reservoir will most likely go through the same phases.

5. A fluctuating reservoir results in poor bottom-insect fish food production because of lack of aquatic vegetative growth to harbor and feed these organisms. The staple foods of trout in this type of habitat become plancton (minute crustaceans), dipteran larvae, and other fish. Trout in a stream or stable lake habitat are essentially insectivorous.

6. The Gunnison River drainage now ranks first in stream fishing pressure in the State. It absorbs 16% of Colorado's stream fishing pressure. The drainage ranks third in favoritism with Colorado fishermen.

7. Approximately $3,700,000 of income to the State from fishermen is traceable to the fisheries of the Gunnison River drainage. The amount supplied by the area to be inundated to this figure is unknown.

8. The building of Curecanti Dam will substitute a mediocre reservoir fishery for a now relatively good river fishery.

APPENDIX K

APPENDIX K

STATEMENTS MADE BY GILBERT N. HUNTER, COLORADO GAME AND FISH DEPARTMENT, CONCERNING THE EFFECTS OF CURECANTI RESERVOIR ON THE BIG GAME HERDS OF THE AREA.

1. The deer and elk herds wintering between Gunnison and Sapinero have a very restricted narrow winter range. This range is quite depleted of browse from past overuse by wintering deer. The situation is now critical and any reduction in winter range by reservoir flooding will necessitate rather drastic reductions in the wintering deer herds.

2. Deer are essentially a browse-eating animal and supplementary feeding of hay for any protracted length of time is unsuccessful. The only known methods to improve the winter-use situation are range reseeding or reduction of game herds to conform with available winter range.

3. Recent airplane and ground counts in the area show an average of 61 deer per square mile. A count of 2200 deer actually in the inundated area (2,500,000 acre ft. reservoir) was made. The numbers of big game affected by the flooding of this winter range are approximately 10,000 deer and 2,500 elk.

4. It is estimated that the big game herds affected should be reduced approximately 60% to offset the loss of flooded-out winter range from Curecanti Reservoir.

5. At the going legal rate of $50.00 per deer and $100.00 per elk, the big game herds affected are worth a minimum of $750,000.00 to the State of Colorado.

   In 1949 approximately 2,700 deer hunters and 480 elk hunters sought game from these affected herds. The kill was 1,893 deer and 475 elk. These hunters spent approximately $335,500.00 directly attributable to their hunting trip.

6. It should be understood that the reduction in game herds made necessary by the construction of Curecanti reservoir will not be a total loss. Arrangements will be made to have an increased hunter take as needed.

7. The Gunnison area now ranks fifth in hunting pressure and success ratio within the State.

8. The monetary loss from the necessary reduction in game herds will be borne to the greatest extent by Gunnison County. Hunting pressure varies greatly by hunter success ratio. The resultant shift of hunters to other areas of the State will not greatly affect the overall income to Colorado from big game hunting sources.

APPENDIX L

APPENDIX L

SUMMARY STATEMENT BY SILVON SMITH OF GRAND JUNCTION, REPRESENTATIVE OF THE COLORADO RIVER WATER CONSERVATION DISTRICT BOARD, PRESENTED TO THE POLICY AND REVIEW COMMITTEE ON MARCH 3, 1952.

Since this matter was not to be published, I did write a short letter to Frank Delaney, Attorney for the Colorado River Water Conservation District Board, in which I set out, roughly, Plan E and said that I had approved on the theory that it provided 420,000 acre-feet of water for potential use in the Gunnison Basin outside of the hold-over water; and that I believed that the plan was economically feasible and was a plan that could be agreed upon by everybody and that I had approved it and said that I may have overstepped my authority but since I represented the District, I had approved.

My representation on this Committee is under the authority of the Colorado River Water Conservation District Board which had signified its opinion that the Curecanti Reservoir should be constructed to the capacity of 2-1/2 million acre-feet. Whether or not I exceeded my authority in representing this District on the Policy and Review Committee might be subject to question but it has been my theory that the study made by this Committee would be somewhat more exhaustive than had been possible for the Colorado River Water Conservation District Board and in the belief that the Gunnison County area would eventually wish that the reservoir had been built to a capacity of 2-1/2 million acre-feet, they are presently very much of the opinion that such a reservoir would be to their detriment, and that I have approved, as a member of this Committee, the construction under Plan E on the theory and in the belief that it will reasonably protect Western Colorado and is an agreement which can be unanimously approved by that area. The study of this Committee has in no way touched upon plans for transmountain diversion and in no way approves any such plan.

APPENDIX M

APPENDIX M

FINAL STATEMENT OF C. N. FEAST, DIRECTOR, COLORADO GAME AND FISH DEPARTMENT, BEFORE THE GUNNISON RIVER STORAGE POLICY AND REVIEW COMMITTEE ON MARCH 3, 1952 .

I will accept plan E subject to the following conditions:

1. That all lands and waters contained within the project area shall be open to public hunting and fishing consistent with the primary purposes of the project.

2. That public access to these lands and waters shall be maintained at all times.

3. That the project be constructed and operated in accordance with the provisions of Public Law 732, 79th Congress, Second Session.

APPENDIX N

APPENDIX N

STATEMENT BY MR. GEORGE CORY OF MONTROSE AT A MEETING OF THE POLICY AND REVIEW COMMITTEE--GUNNISON RIVER STORAGE, MONDAY, MARCH 3, 1952.

1. Plan E - Curecanti - 940,000 acre-feet
   Crystal - 510,000 " "
   Whitewater - 880,000 " "

2. The engineers, the Chairman and the legal counsel for the Colorado State Water Board are supporting Plan E as a reasonable compromise. The engineers have committed themselves on its feasibility, both costwise and constructionwise. The legal counsel and Chairman say it is the plan they can best bring to realization.

3. However, in the written report submitted to this Committee by Mr. Jacobson and signed by Mr. Larson of the Bureau of Reclamation, it is stated that Table I of the report shows conclusively that none of the alternative plans considered on the Gunnison River are suitable substitutes for the large Curecanti Reservoir. Also, plans E and F are even less attractive than the former alternative plans B and C. And at a further point in the report, the statement is made in essence that the proposition of studying new reservoirs can only be undertaken in connection with the preparation of definite plan reports, each requiring specific authorization. In answer to direct questions by myself, Mr. Jacobson said that in the Bureau's opinion, Plan A was the advantageous plan to the Federal Government, and that the units on the Gunnison River will be scrutinized more closely by the Bureau of the Budget and Congress because of Power and construction costs.

3. The above warning signals notwithstanding, I will go on record for Montrose County as accepting the Plan E which Judge Stone and his departmental men have so capably presented.

4. Now, this is no horsetrading deal. There is the proposition flat and simple.

5. Inherent with this, of course, is the assumption that Judge Stone, his engineering department and legal counsel, can reach an accord on Plan E with the Bureau of Reclamation, and all will lend their efforts to push Plan E and push it hard. This is the plan, and for purposes of authorization, we will all stay hitched to it.

6. I would like to explore one possibility that this Committee has not considered with respect to Plan E. That is that we ask Crystal, as well as Curecanti, be built in the initial phase. With no objections, it is then established that Crystal shall be in the initial phase of the Upper Colorado River Storage Project.

APPENDIX O

APPENDIX O

SUMMARY STATEMENT BY F. M. PETERSON, DELTA COUNTY REPRESENTATIVE, PRESENTED TO THE POLICY AND REVIEW COMMITTEE ON MARCH 3, 1952.

Delta County, although not completely satisfied that the full requirements under that storage above Delta had been taken care of in Plan E, would recommend that Plan E be proposed to the Colorado Water Conservation Board as recommendations from this Committee but that both Crystal and Curecanti, as proposed in Plan E, shall be constructed as a part of the initial phase.

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APPENDIX P

APPENDIX P

SUMMARY STATEMENT BY ED L. DUTCHER, GUNNISON COUNTY REPRESENTATIVE, PRESENTED TO THE POLICY AND REVIEW COMMITTEE ON MARCH 3, 1952

After the meeting on February 23, I went home for the purpose of thinking this matter over by myself. I have found in my experience over a period of years that sometimes a person has an opportunity to think things out a little more clearly and a little more satisfactorily if he is given a little more time and when he is by himself. For approximately three days I thought this matter over before consulting with the Executive Committee of the Gunnison Watershed Conservation Committee.

My conclusion was simply this--that looking at it purely from a selfish standpoint as a representative of the people in the Upper Gunnison River Basin, it would probably be better to delay any kind of an agreement at the present time rather than to enter into an amicable settlement under Plan E. However, I felt that my responsibility as a member of the Policy and Review Committee did not stop there. I felt that we should look at it in two ways, namely, what would be for the best interests of Western Colorado, including the Upper Gunnison River Basin, and at the same time provide as much protection as is reasonably possible under the circumstances for Gunnison County.

In problems of this kind, it is impossible for one area to obtain all of the things that it would like to have--it is purely a matter of give and take. I sincerely concluded that under all of the circumstances and looking at it from a very broad standpoint and also in more or less of an altruistic way, as far as the people in the Upper Gunnison River Basin are concerned, that it would be advisable to go along with Plan E if we were given assurances of certain protective measures for the Upper Gunnison River Basin.

As a result, I called a meeting of the Executive Committee of the Gunnison Watershed Conservation Committee which represents all the various organizations and people which would be affected either directly or indirectly by the proposed project in the Upper Gunnison River Basin. The large committee was established and set up approximately fifteen years ago. It is the only agency which purports to speak for the Upper Gunnison River Basin and its tributaries in these important water matters. The Executive Committee was organized about a year ago for the purpose of acting for the big committee and for the Gunnison County people. At a meeting of the Executive Committee, held on the 26th of February, 1952, for the purpose of discussing this matter, all of the members of the Executive committee were present with the exception of three. I had an opportunity to talk with two of the three absent members. One of the absent members with whom I talked agreed to go along with the action of the Executive Committee. The other member was opposed to any plan or project that would inundate the Iola Basin. The Executive Committee discussed this matter from about 8:00 o'clock at night until well into the next morning. The subject was discussed pro and con. At the conclusion of the meeting, the Executive Committee agreed that it would be

to the best interests of Western Colorado, as well as Gunnison County, if it went along with Plan E, which would likely afford the greatest amount of protection for the Upper Gunnison River Basin. The members of the committee also felt that a majority of the people in Gunnison County, after they were fully advised and informed, would perhaps go along with the plan. Obviously, it would be impossible to have unanimity of thought in the Upper Gunnison River Basin. I personally feel that if and when this plan is fully presented to the people in the Upper Gunnison River Basin and after those people are advised what the situation might be if no agreement was reached, that a majority of the people in Gunnison County would then go along with the Plan E.

Consequently, as a member of this Committee, I am now ready to state that I will go along with Plan E, provided, and this must be in the record, that there are certain protective measures agreed upon for the areas affected, particularly Montrose and Gunnison. I have no doubt that such protective measures, which I consider of minor importance comparable to the agreement on the size, capacity and location of the reservoirs, can be agreed upon. I cannot give my unequivocal agreement to Plan E until we see what we can do about these protective measures consisting particularly of the following:

1. That the road be changed, that it continue to be designated as U. S. Highway No. 50, and that it continue to run through the Cities of Montrose and Gunnison.

2. That the government make certain arrangements and provide certain facilities to take care of the influx of school children who will be in the affected areas during the construction period.

3. That some arrangement be made with the Upper Gunnison River Basin people concerning the transfer of the Taylor Park Reservoir. water rights and storage rights to them.

4. That Montrose and Gunnison Counties be reimbursed for their tax loss during their construction period and thereafter either by the Bureau of Reclamation or some other federal agency.

5. That some definite agreement be made with the Game and Fish Department and the Fish and Wildlife Service to regulate the flow of the Gunnison River below the Taylor Park Reservoir and to regulate the draw-down of the Crystal and Curecanti Reservoirs so as to cause as little damage to the fish and wildlife as is possible.

6. That if a committee is selected for that purpose, some representative of Gunnison County be appointed and selected to serve on the committee.

7. That the people who are dispossessed by reason of the acquisition of lands for the construction of the reservoirs, either ranchers or resort owners, be given some kind of priority to locate on public lands elsewhere in that area, or if they so desire, around the shores of the reservoirs.

8. That in so far as the Upper Gunnison River Basin people are concerned, that the 160 acre limitation be definitely waived or modified to correspond with local conditions.

9. That in acquiring the resorts, ranches, livestock holdings, which may be affected by the reservoirs, a strong recommendation shall be made, or some method worked out with the people who are going to be dispossessed in order that they will not pay an excessive income tax either to the Federal or State government.

10. Other miscellaneous protective measures.

APPENDIX Q

APPENDIX Q

February 29, 1952
Montrose, Colorado

Mr. George Cory,
Gunnison Basin Water Review Committee,
Montrose, Colorado.

Dear Sir:—

Our group of which Mr. Lyle Barton, was chairman, went to Cimarron and interviewed the following persons in regard to the alternate plan suggested or proposed in place of the original Curecanti Reservoir Dam and they expressed themselves as follows:

Mr. and Mrs. W. T. Newberry owners of the Newberry Cafe and Store, in Cimarron stated that they were in favor of the change of plans.

Mr. Arlington H. Loveless, Farmer, who expressed himself in favor, asking the following questions, (1) would all owners be paid for their property which would be covered by the reservoir and (2) where would the new highway be located.

Mr. Leonard H. West, owner of a home in the old Cimarron townsite, expressed approval of the proposed Crystal Project.

Mr. Stuart Krebs, of Montrose is one of the principal owners of the Cimarron townsite. He has expressed himself in favor of the Crystal Creek Reservoir Site.

We were unable to contact Mr. Esten Orme, Rancher at the forks of the Big and Little Cimarron Rivers, and we will not be able to do so prior to your next meeting with the Board, however, Mrs. Mildred T. Orme, his wife, stated that they would not oppose the proposed project. These folks will suffer some damage, as the high water line will be a detriment to them, and they will lose more acres of summer pasture than any other persons. It will also cut their holdings into two parts, This was pointed out to her by us prior to asking how they might feel about it.

Mr. and Mrs. Fred E. Modine, resort owners on the Little Cimarron, expressed themselves in favor of the project, altho they too asked if compensation for taking their property would be made if the project is consummated.

Mr. Farrel Hawk, Cattlerancher on the Little Cimarron expressed whole hearted approval of the change in plans.

Mr. William H. Brower, Rancher, on the Big Cimarron likewise gave full accord on the proposal. He will lose some cultivated lands and possibly have to move his house.

We requested the Irrigation Division Engineer of Montrose to accompany us to answer questions of an engineering nature, and to explain the map furnished by the Colorado Water Conservation Board. This he did.

Very truly yours,
/s/ Gilbert Howell