United States Department of the Interior
Bureau of Reclamation

Upper Colorado Region, Salt Lake City, Utah

Environmental Assessment

COMPLETION OF BOSTWICK PARK PROJECT
COLORADO

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A. DESCRIPTION OF THE PROPOSAL

1. General

This environmental assessment concerns the completion of the Bostwick Park Project and is prepared to help determine whether or not the proposed action qualifies as a "major Federal action significantly affecting the quality of the human environment," as specified in Section 102(2)(C) of the National Environmental Policy Act of 1969 and requires the filing of an environmental statement.

The Bostwick Park Project is sponsored by the Bostwick Park Water Conservancy District and involves upgrading an existing inadequate irrigation system by providing regulatory upstream storage and an expansion of service area capability. The project was authorized for construction as a participating project of the Colorado River Storage Project by Public Law 88-568 on September 2, 1964. The District represents an organization of water users with headquarters in Montrose, Colorado. The repayment contract with the District was validated in the District Court, Montrose County, on May 3, 1966. Construction on the first feature of the project, Silver Jack Dam, was initiated in 1966.

2. Project Description

The project is located in west central Colorado in the Gunnison River basin. Silver Jack Dam and Reservoir, the existing diversion works on Cimarron Creek, and about 3 miles of existing canal lie in Gunnison County while the balance of the project is located in Montrose County. A project map has been included as a frontispiece to this report and indicates the location of the various features. The reservoir is designed to provide an average of 11,100 acre-feet of additional water annually at the beginning of the existing Cimarron Ditch for the irrigation of 5,809 acres of land. This land includes 4,500 acres of land that were irrigated, but with an inadequate water supply prior to the construction of Silver Jack Reservoir. The remaining 1,309 acres were not irrigated prior to construction of the reservoir. Of this figure 482 acres are proposed to be irrigated from the Bostwick Lateral and 302 acres from the Lytle Lateral. The remaining 525 acres is currently being developed in numerous small scattered tracts which are being absorbed into existing farms and are utilizing existing distribution systems.

Irrigation shortages for the 1944-1964 study period have averaged 18 percent of the requirement without the Bostwick Park Project. Average annual and maximum annual shortage for the various areas over the 21-year period are shown on the following page.

Service Area	Preproject Water Shortages (Percent of Requirement) Average Annual	Maximum Annual
Cimarron Ditch	38	64
Vernal Mesa Ditch	17	39
Hairpin Ditch	18	40
Cedar Creek Tributaries	5	29

If the project-developed water supply had been available, it is anticipated that irrigation shortages would have been experienced in only 8 years of the 21-year study period and would have averaged only 2.7 percent. The greatest shortage, about 15 percent, would have occurred in 1956. Minor shortages in the amount of water bypassed for the stream fishery would have occurred occasionally but would have averaged only 1.7 percent of the requirement.

Three segments of the project remain to be completed: the Bostwick Lateral, the Lytle Lateral, and rehabilitation of the Bostwick Park drainage system. The two laterals would irrigate 784 acres of land and permit an increase in the area's production of livestock feeds. The drain rehabilitation is necessary to handle surface runoff, reduce erosion in the various drains, and clean out obstructions to flow. The drainage system is now in poor condition due to lack of maintenance, and if the Bostwick Lateral is constructed, surface runoff should increase and the drainage rehabilitation would alleviate some of the potential problems.

3. Work Completed

The principal feature of the project, Silver Jack Dam and Reservoir, was completed in 1970 and runoff was first stored in 1971. The dam is located on Cimarron Creek approximately one mile below the confluence of the West Fork Cimarron Creek and Cimarron Creek. The dam is a rolled earthfill structure constructed of materials obtained in the near vicinity. The reservoir has a total capacity of 13,520 acre-feet, including 12,820 acre-feet of active storage and 700 acre-feet of dead and inactive storage. Of the active storage, 11,100 acre-feet is allocated for irrigation use and 1,720 acre-feet can either be retained in the reservoir or used to supplement downstream fishery flows.

The Forest Service has performed some revegetation work around the reservoir which should be completed in 1973. This work has been performed under terms of a Memorandum of Understanding between the Forest Service and Bureau of Reclamation. It includes seeding, tree planting, fertilization, and application of soil retention blankets to reservoir slopes exposed by excavation for the dam foundation and in borrow areas.

Recreation access and facilities will be constructed by the Forest Service in the future. There is no direct access to the reservoir at this time although fishermen can hike in from an improved road. The distance is less than one-half of a mile. Forest Service regulations now prohibit all boating on the reservoir and this will continue at least through 1973. There are no current use figures for the reservoir. Future recreation developments will be planned by the Forest Service but funding and construction dates are uncertain at this time. The scale of the development has not been determined at this time although a boat launching facility and access would be certain.

Water released from the reservoir flows down Cimarron Creek for 2.5 miles to an existing diversion dam. This dam bypasses fishery flows and water required to satisfy existing water rights downstream and diverts the remainder into the existing Cimarron Ditch. The ditch conveys water 23 miles to Cerro Summit. Some water is released along the ditch to supplement local streams in irrigating small tracts of land in the Cimarron area. The remaining water is released at the Summit into the Vernal Mesa and Hairpin Ditches which, with their various branches and laterals, distribute it to the land. The Vernal Mesa Ditch serves the Bostwick Park and Lytle areas to the north and the Hairpin Ditch serves the Shinn Park and Kinikin Heights area to the south. The system was in operation prior to the Bostwick Park Project and depended on diversions of direct natural flow from Cimarron Creek. Prior to the storage of high spring flows of Cimarron Creek in Silver Jack Reservoir, irrigation water was generally abundant until the latter part of the irrigation season when the supply fell off. During this period of low water, flows in Cimarron Creek were also depleted. Storage at Silver Jack now allows high spring flows to be stored and later released for irrigation and maintenance of stream fishery.

In addition to completion of the dam and reservoir, replacement of a 1,450-foot section of corrugated pipe in the existing Vernal Mesa Ditch should be completed the first of April 1973. Due to the hydraulic characteristics of the corrugated pipe and its deteriorated condition, the maximum discharge capability was determined to be about 80 c.f.s. (cubic feet per second). Erosion from pipe leakage as well as potential complete failure of the pipe itself was further reasons for the replacement. The replacement with precast concrete pipe will increase the capacity to 93 c.f.s., and eliminate erosional damage on the adjacent hillside and potential flood hazard to the highway below the pipe. A negative determination of environmental impact concerning the replacement (NDN 72-14-UC) was prepared and approved during July 1972. The new pipe section will be in operation during the 1973 irrigation season.

4. Proposed Future Construction

As authorized the Bostwick Park Project included the construction of two irrigation laterals--the Bostwick Lateral and the Lytle Lateral--and the rehabilitation of drains in Bostwick Park.

a. Bostwick Lateral

The proposed Bostwick Lateral would divert from East Vernal Mesa Ditch and would have an overall length of 3.3 miles. It would include an initial 0.2 mile earth section with a capacity of 15 c.f.s. This section would have a bottom width of 4 feet, and a water surface width of 9.6 feet at the maximum water depth of 1.4 feet. At the terminus of the short section the water would enter a 24-inch diameter buried concrete siphon extending 1.1 miles across the Bostwick Park irrigated land area. The siphon would pass under and beyond the West Vernal Mesa Ditch. At the siphon outlet, the water would be divided into two small ditches to serve 482 acres of new land above the West Vernal Mesa Ditch. One ditch extending northwest would be 1.4 miles long, have a capacity of 10 c.f.s., a bottom width of 3 feet and a water surface width of 7.8 feet at the maximum water depth of 1.2 feet. The other ditch would extend southeast 0.6 miles and have a capacity of 5 c.f.s., a bottom width of 2 feet, and a water surface width of 5.6 feet at the maximum water depth of 0.9 feet. All open ditch reaches would be unlined earth sections with 2 to 1 side slopes. The data presented here and below for the Lytle Lateral represent preliminary designs. Final design could change these figures, but changes would not be great enough to substantially alter project impacts.

The design data report for Bostwick Lateral anticipates no construction of access roads for operation and maintenance purposes. Construction access on the siphon would be strictly on the 50- to 60-foot wide right-of-way and this right-of-way would be restored and farmed. The ditch sections of this lateral are in flat terrain and no construction roads or operation and maintenance roads would be built. Access would be gained by driving along the side of the ditch within the right-of-way.

b. Lytle Lateral

The Lytle Lateral would divert from the existing Vernal Mesa Ditch near the eastern edge of the irrigated lands in Upper Bostwick Park. It would have an overall length of 4.4 miles. About 3.2 miles of the lateral would be open earth section and 1.2 miles would be in 5 buried concrete pipe siphons. The capacity of the lateral would be 10 c.f.s. The open sections would have a bottom width of 3 feet and a water surface width of 7.8 feet at the maximum water depth of 1.2 feet. The first three

siphons would be 18 inches in diameter and the last two would be 21 inches.

The Lytle Lateral is located on steep uneven ground and an operation and maintenance road would be necessary. This road would be constructed along the right-of-way on the bank of the lateral using material from lateral excavation. The road would have a 12-foot roadbed and its right-of-way would be used for construction.

Most of the terrain which the Lytle Lateral would cross is steep and irregular. Excavation for the lateral would produce more material than required for embankments and backfills, resulting in excess material. This material would be utilized along the lateral for construction of the operation and maintenance road.

Either earth lining or concrete pipe sections would be necessary for much of this lateral as the material through which it would be excavated is pervious to water. Final selection of an earth lining borrow area has not been made, but it probably would be near the potential irrigation area west of Highway 347. If suitable earth material is not located, either concrete lining or buried pipe would be used.

c. Bostwick Drain Rehabilitation

The drainage rehabilitation work would involve the rehabilitation of 3.4 miles of the existing drainage system in Bostwick Park, the construction of nine rock drop structures on the drainage system, and the construction of 19 surface drain inlets along the sides of the drains.

Excavated material from the drains would be used to repair drain dikes. The drop structures would be built of gabion-type construction (wire baskets filled with cobbles and boulders) using oversize rocks from existing commercial sources. Surface-inlet structures would consist of corrugated pipes that would drop excess surface water into the drains. Existing maintenance roads parallel some of the drainage system, but some access would have to be gained across fields and along the ditch bank.

d. General Construction Factors

The proposed construction schedule for the laterals lists construction of the Bostwick Lateral during FY 1974 with Lytle moved out to FY 1979. Drainage rehabilitation work would proceed simultaneously with the Bostwick Lateral work.

Construction of these features would be supervised by the Bureau of Reclamation. Any contractor's offices or storage facilities

required on site would be mobile units. No permanent operation and maintenance buildings would be required at these sites.

B. DESCRIPTION OF THE ENVIRONMENT

1. Climate

The climate of the general region is characterized by low precipitation, fairly long, cold winters, and short, moderately warm summers. Official weather records have not been obtained for Bostwick Park but estimates have been made by correlations with official records at nearby Montrose. Estimations place the precipitation at 13 inches annually and the frost-free period at 125 days. The frost-free period is long enough for the production of general feed and cash crops but not for some fruit and truck crops.

Temperature records kept at Cimarron, 12 miles east of Bostwick Park at an elevation of 7,100 feet, from 1951 to 1961 showed an average July maximum of 86.4° F. and an average December minimum of 1.0° F. Temperatures are generally lower and precipitation higher at Silver Jack Reservoir.

2. Geology and Topography

a. Project Lands

Silver Jack Dam was constructed on the north edge of the San Juan Mountains a short distance downstream from the confluence of three forks of Cimarron Creek. The fairly narrow canyon at the damsite is eroded from glacial till which extends for at least a depth of 117 feet below the streambed. The reservoir basin is entirely in glacial till except for stream channel gravel along Cimarron Creek and the West Fork. No significant seepage loss is expected from the reservoir; and although the glacial till is susceptible to sliding, it is not expected that creation of the reservoir will cause new landslides to develop as the materials around the reservoir are generally already saturated by the high ground water table and numerous seeps and small springs. A large landslide occurred on the downstream portion of the right abutment when construction was partially completed. Remedial work to stabilize the slide mass consisted of drainage work, the placement of a buttress fill, and the relocation of the spillway stilling basin.

Cimarron Creek rises on the San Juan Mountains east of the Uncompahgre River and flows northward about 25 miles through a deep, narrow valley to enter the Black Canyon section of the Gunnison River. Cedar Creek, a small, low tributary of the Uncompahgre River, rises at Cerro Summit, a low saddle on Cimarron Ridge, and continues westward about 15 miles to join the river near Montrose.

Most of the project lands are in Upper and Lower Bostwick Parks and the Lytle area, all of which are north of Cedar Creek on the southwestern slope of the Black Canyon anticlinal fold. Smaller project land areas are located adjacent to Cedar Creek and to the south in Shinn Park and Kinikin Heights. Lands in the northern part of the project area drain toward the Gunnison River and smaller areas drain eastward toward Cimarron Creek. Project lands range in elevation from 6,500 to 7,700. All project irrigation lands have soils of alluvial origin, formed as slope wash on the steeper slopes and as alluvial flood plain deposits on the more gently sloping bottom lands. The soils generally rest on unconsolidated materials known as Florida gravels of stream origin or on Cerro till of glacial origin. These materials in turn are generally underlain by the consolidated Mancos shale formation of marine origin.

Bostwick Park, the location of the unfinished construction on the project, is a small remnant valley lying against the southwest side of the Black Canyon anticline. The underlying formation of the valley itself is the Cretaceous Mancos formation. Immediately to the northeast is the Cimarron fault, resulting from the uplift. The Lower Cretaceous Dakota formation and the Jurassic Morrison formation are exposed above the park. The center of the uplift is composed of Precambrian gneiss, schist, and granite. A more detailed description is included on the following page (Figure 1).

Bostwick Park is divided into upper and lower parts by a transition in topography that occurs about a half mile west of Highway No. 347 which extends north to the Black Canyon of the Gunnison. Lower Bostwick Park, northwest of this transition, has retained the trough-like appearance of the ancient stream valley, with its arable lands occupying the bottom and side slopes of the valley. This lower part of the park drains northwest and the water joins the Gunnison River via Red Rocks Canyon. Upper Bostwick Park has been cut by a series of deep arroyos draining southwest toward Cedar Creek.

The Park varies in elevation from 6,800 feet near Red Rocks Canyon to nearly 7,300 feet at the extreme southeastern end. South of the park the land falls steeply to the southwest, dropping about 500 feet in a mile. Northeast of Bostwick Park the land rises rapidly for about 4 miles to the rim of the Black Canyon where the elevation varies from 8,000 to 8,400 feet.

The Mancos shale which underlies the park is covered by an ancient stream terrace. Deposits of unconsolidated alluvial gravels underlie the soils which are derived from all of the various rocks in the area. The soils are predominantly clay loams to heavy clay loams, well drained and low in salinity and alkalinity.

FIGURE 1
GENERALIZED CHART OF TIME AND ROCK UNITS
Bostwick Park Project

ERA	SYSTEM	FORMATIONS	SYMBOL	DESCRIPTION
CENOZOIC	TERTIARY	San Juan	Tsj	Bedded tuff, agglomerate, and breccia of andesite and latite, equivalent to West Elk breccia
MESOZOIC	CRETACEOUS	Fruitland (Mesa Verde Formation)	Kf	White sandstone interbedded with coal, carbonaceous shale, and green to black shale
		Pictured Cliffs (Mesa Verde Formation)	Kpc	White calcareous sandstone, interbedded calcareous shale and siltstone
		Mancos	Km	Dark gray to black, fissle marine shale, scattered lenses of gray sandstone
		Dakota (Dakota Formation)	Kd	Light gray platy sandstone, dark gray carbonaceous shale, some thin coal beds, nonmarine origin
		Burrow Canyon (Dakota Formation)	Kb	Light gray crossbedded sandstone and conglomerate, discontinuous beds of light gray shale, deposited by meandering streams
MESOZOIC	JURASSIC	Morrison (Morrison Formation)	Jm	Varicolored red, green, gray bentonitic mudstone and shale, lenticular sandstone, fluvial and lacustrine origin
		Wanakah (Morrison Formation)	Jw	Light gray silty mudstone and cherty limestone, some eolian sandstone and gypsiferous mudstone
		Entrada	Je	Friable, yellow to pink, crossbedded eolian sandstone
PRECAMBRIAN		Mica schist, meta-quartzite, gneiss, amphibolite, granodiorite, pegmatite	pC	Light gray quartz mica schist, gray fine-grained metaquartzite, well foliated micaceous gneiss, dark hornblende schist, coarse-grained dikes and sills

The above mentioned formations (location indicated on Geologic Map No. 860-400-14 on the next page) are characteristically weak and unstable when subjected to seepage when they are in a weathered condition. It will be necessary, therefore, wherever these conditions are anticipated to consider them in the design of the laterals. Stability of cutslopes and prevention of seepage could be largely accomplished through appropriate design and location.

The Cimarron fault is located in the area of proposed construction but should not require other than normal earth and rock slope design criteria. The fault does not constitute a structural problem.

The stream terrace alluvial gravels would require particular attention to prevent seepage into adjacent areas.

b. Bostwick Lateral Area

The irrigated land area traversed and served by the proposed Bostwick Lateral lies in the bottom and on the southwest side of Bostwick Park and slopes toward the middle of the park to the northeast. It is undulating to slightly rolling with a general gradient of 4 - 6 percent and extreme gradients of 8 - 10 percent. The soils are medium to slightly fine in texture, low in salinity and alkalinity and generally well drained.

The lands are about 60 percent in class 2st and 40 percent in 3st. Class 1 lands represent the top classification for irrigated agriculture. Class 2 lands have moderate suitability for irrigation farming and Class 3 lands are still suitable but border on marginality. The "st" designation indicates deficiencies in soil and topography. The class 2st and 3st lands differ primarily in degree of gradient and surface relief; the 3st lands being somewhat steeper and more undulating or rolling than the 2st lands. In some instances the 3st land has a slightly heavier subsoil.

c. Lytle Lateral Area

The Lytle area, separated from Lower Bostwick Park by a narrow ridge of the Jurrasic Morrison formation, is several hundred feet higher in elevation than lower Bostwick Park. The Lytle area is a remnant of a small intermittent stream valley and has a trough-like shape.

The topography is generally steeper and more irregular than the Bostwick Lateral lands. The soils on the other hand are very similar to those of the Bostwick lands. These lands are about 48 percent in class 2st and 52 percent in class 3st.

The land which the lateral would traverse is mostly on a steep escarpment sloping to the southwest toward Bostwick Park. The gradient of this escarpment approaches 40 percent in some places.

3. Seismicity

The site of the Bostwick Park Project can be considered in a relatively mild seismic area. Figure 2, Seismic risk map of Western U.S. on the next page, places Colorado in a Zone 1 risk classification. The Colorado map of the Location of Earthquake Epicenters, if compared to maps of other states, places this state in a relatively inactive area relative to major earthquakes.

4. Vegetation

Silver Jack Reservoir inundated a valley dominated by meadowland with stands of aspen, Douglas fir, and blue spruce. The distinguishing vegetation in the surrounding area is lodgepole pine, Engleman spruce, Douglas fir, aspen, Thurber's fescue, and mountain brome. The existing Cimarron Ditch and other project distribution facilities pass through this type of vegetation and also two other general types. One type, at a higher elevation, is characterized by oakbrush, sagebrush, mountain brome, and western wheatgrass. The lower zone is characterized by sagebrush, pinon pine, juniper, Indian ricegrass, needle-and-thread grass, and western wheatgrass.

In Bostwick Park, where construction remains to be completed, the nonirrigated lands, including all of the land to be served by the Bostwick and Lytle Laterals, are dominated by a cover of sagebrush and sparse grass, with small areas of pinon-juniper. The grasses include cheatgrass, and slender and western wheatgrass. Crested wheatgrass has been introduced on much of this land. Lands along the nearby ridges and steeper south and west slopes are characterized by pinon-juniper intermixed with the sagebrush. Some protected slopes have Gambel oak and serviceberry interspersed with the sagebrush. Forbs common to the area include lupine, Indian paintbrush, globemallow, flax, mullein, sunflower, and yucca. Irrigated lands within the park produce livestock feeds and limited amounts of cash crops. Lands adjacent to the Bostwick drains are in irrigated crops or pasture. There are a few acres of marshland including a 6-acre cattail marsh near the middle of the drains. Reed Canary grass grows in the bottoms and on the slopes of many of the drains and is effective in reducing erosion.

5. Fish and Wildlife

Cimarron Creek was the main fishery affected by development of the Bostwick Park Project. Prior to construction of Silver Jack Dam, sections of Cimarron Creek were rated from poor to good as a fishery. The 4.5 miles of creek upstream from the Cimarron Ditch headgate

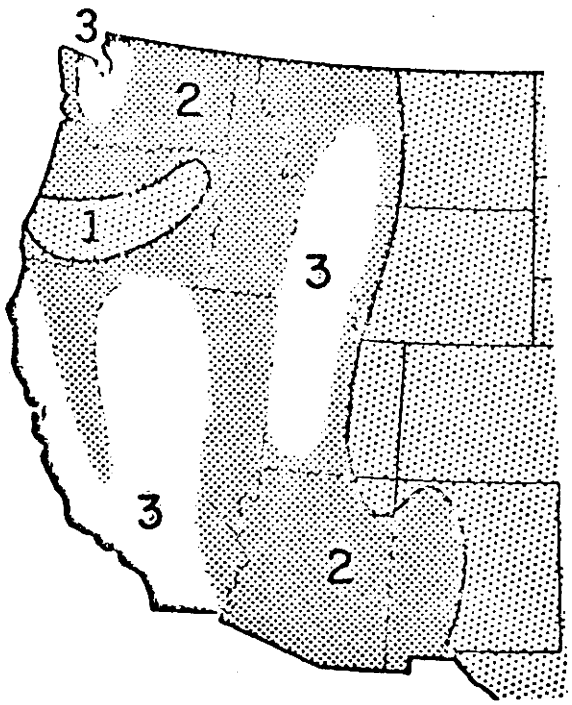

Figure 2. Seismic risk map of western U. S., ESSA/Coast and Geodetic Survey. Zone 1: expected minor damage. Zone 2: expected moderate damage. Zone 3: major destructive damage may occur. From U. S. Dept. of Commerce News, January 14, 1969.

ranged from poor quality in the upper sections where the channel is unstable to good quality downstream from the Silver Jack Damsite where the channel and banks are less unstable. High, muddy spring floodflows spoiled early season fishing by scouring the stream bottom. Cimarron Creek in the 14.5 miles downstream from the Cimarron diversion was a poor to fair fishery with fishing impaired by extremely high and erosive spring runoff.

The game-fish population consisted primarily of stocked rainbow trout with smaller populations of cutthroat, German brown and brook trout. Minimum flows of at least 25 c.f.s. are being maintained in Cimarron Creek below the head of Cimarron Canal from May 16 through August 31 and 8 second-feet during the remainder of the year. Much of this water consists of natural flows bypassed through the reservoir and may be supplemented by releases from the fish and wildlife pool in Silver Jack Reservoir at the option of fish and wildlife agencies.

In Bostwick Park where construction remains, there are no sport fisheries. Small brook trout have entered the lower reaches of the Bostwick drains from Red Rock Canyon Creek and depend on the small flows that are maintained by seepage.

In the higher elevation areas of the Project, where construction of Silver Jack Dam is complete, characteristic wildlife species include the raven, Clark's nutcracker, red fox, black bear, mule deer, snowshoe hare, red squirrel, blue grouse, beaver, gray jay, porcupine, mallard, ground squirrels, chipmunks, and coyotes. The reservoir basin was utilized by beaver, mule deer, and elk.

In lower elevation areas which received irrigation water under the project, species such as the bobcat, Steller's jay, badger, coyote, cottontail, jack rabbit, plain titmouse, chickadee, magpie, turkey vulture, and red-tailed hawk are common.

The sagebrush and grass lands to be served by the Bostwick and Lytle Laterals are used as winter range for mule deer which migrate from the higher lands of the Black Canyon of the Gunnison Monument area and mountains to the east. Some deer remain in the Lytle area year around, and winter use there is heavier than in the Bostwick area. Limited numbers of waterfowl and shorebirds utilize the drainage area in Bostwick Park. There are no rare or endangered species dependent on the Bostwick Park area.

6. Streamflow and Water Quality

The table on the following page indicates the present average monthly flows of Cimarron Creek below the Cimarron Ditch Diversion dam. The table also indicates the conditions that existed prior to the completion of Silver Jack Dam.

FIGURE 3
AVERAGE MONTHLY FLOWS OF CIMARRON CREEK
BELOW CIMARRON CANAL DIVERSION DAM
(c.f.s.)

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	De
Before Bostwick Park Project from USGS Records 1944-64	15	14	16	40	175	325	95	15	10	10	13	1
After Bostwick Park Project from USBR Operation Studies w/laterals	10	11	10	12	105	305	85	25	10	10	8	

The maximum preproject flow was 1,710 cfs.
The minimum preproject flow was 8 cfs.

The average annual flow of Cimarron Creek just above the Cimarron Ditch diversion is 70,100 acre-feet. Evaporation from the Silver Jack Reservoir is estimated at only 300 acre-feet per year thus leaving 69,800 acre-feet before diversions. Water available for diversion to Cimarron Ditch since construction of the dam is about 33,900 acre-feet.

This includes 8,300 acre-feet for both presently irrigated nonproject lands and the Montrose municipal water supply reservoir at Cerro Summit. The annual potential flow of Cimarron Creek since completion of Silver Jack Reservoir, based on preproject water supply studies by the Bureau of Reclamation will average 36,000 acre-feet below the diversion point.

The water of Cimarron Creek has been determined by Bureau of Reclamation laboratory analysis to be of good quality for irrigation during all seasons of the year. The samples tested indicated an average total dissolved solids of only 106 mg/l. The water in Cedar Creek and its tributaries is primarily return flow from the adjacent irrigated mesas and is of fair quality which still should not impair the fertility of the soil.

Fishery flows of at least 25 c.f.s. are being maintained in Cimarron Creek below the head of Cimarron Canal from May 16 through August 31 and 8 c.f.s. during the remainder of the year, plus additional bypasses for decreed downstream diversions. Much of this water consists of natural flows bypassed through the reservoir and may be supplemented by releases from the fish and wildlife pool in Silver Jack Reservoir at the option of fish and wildlife agencies.

Water rights for the Cimarron Canal total 185 c.f.s.; however, maximum capacity of the canal at the heading is about 155 c.f.s. Traditionally, irrigators under this canal have applied a surplus of water during the early season in an attempt to store moisture in the soil for late season. The effect of Silver Jack Reservoir has been to store excess winter and spring runoff to extend the irrigation season into the late summer and early fall so that the excessively heavy early irrigation will not be necessary. Under the present contract between the United States and the Cimarron Canal and Reservoir Company, canal capacity above 120 c.f.s. at the heading is reserved for conveyance of project supplied water when needed.

7. Recreation

There are no recreation facilities at Silver Jack Reservoir at present. In the future access will be established to the reservoir and recreation facilities will be constructed. The type, location, and extent of the facilities has not been determined at this time.

There are no recreation facilities in Bostwick Park nor are there any waters capable of supporting a sport fishery. The only recreation in the immediate area is deer and small game hunting. This situation is not likely to change in the future as there is no apparent potential for development.

The National Park Service maintains recreation facilities on the south rim of the Black Canyon of the Gunnison National Monument about 6 miles from Bostwick Park. The culinary water supply must be brought in by tank truck and this limits the development of the area. Activities include hiking, sightseeing, nature study, and picnicking. Approximately 250,000 people visit the south rim each year, all of whom must cross Bostwick Park.

8. Historical or Archeological Sites

There are no known historical or archeological sites in the area to be developed by the Bostwick and Lytle Laterals, nor are there any such listed in the National Register of Historic Places. Correspondence with the State Historical Society of Colorado indicates that they have no knowledge of any historic or prehistoric sites that would be adversely affected by the proposed work. Their letter has been included as an appendix to this statement. They have requested that all discoveries of pictographs, petroglyphs, or other evidence of Indian habitation which are uncovered during construction operations be promptly reported to their representative.

In July 1967, an archeological survey was made of the Silver Jack Reservoir area by archeologists from the University of Colorado under a contract with the National Park Service. No significant archeological sites were discovered.

9. Esthetics

Bostwick Park is a pleasant little valley characterized by green fields and grazing livestock. Vernal Mesa, the low pinon-juniper covered mountain to the northeast forms a background with higher snow capped peaks of the West Elk Mountains visible further away. The rugged San Juan Mountains are plainly visible to the south. A few junipers and pinon pines line the low ridge to the southwest just beyond the proposed Bostwick Lateral.

The aerial photograph on the next page is a view of the Bostwick Park area looking southeast. Lower Bostwick Park is in the foreground with Upper Bostwick Park toward the upper right near U.S. Highway 50.

10. Land Use Patterns

Lands already affected by the construction of Silver Jack Dam were primarily used for livestock grazing, wildlife habitat, and

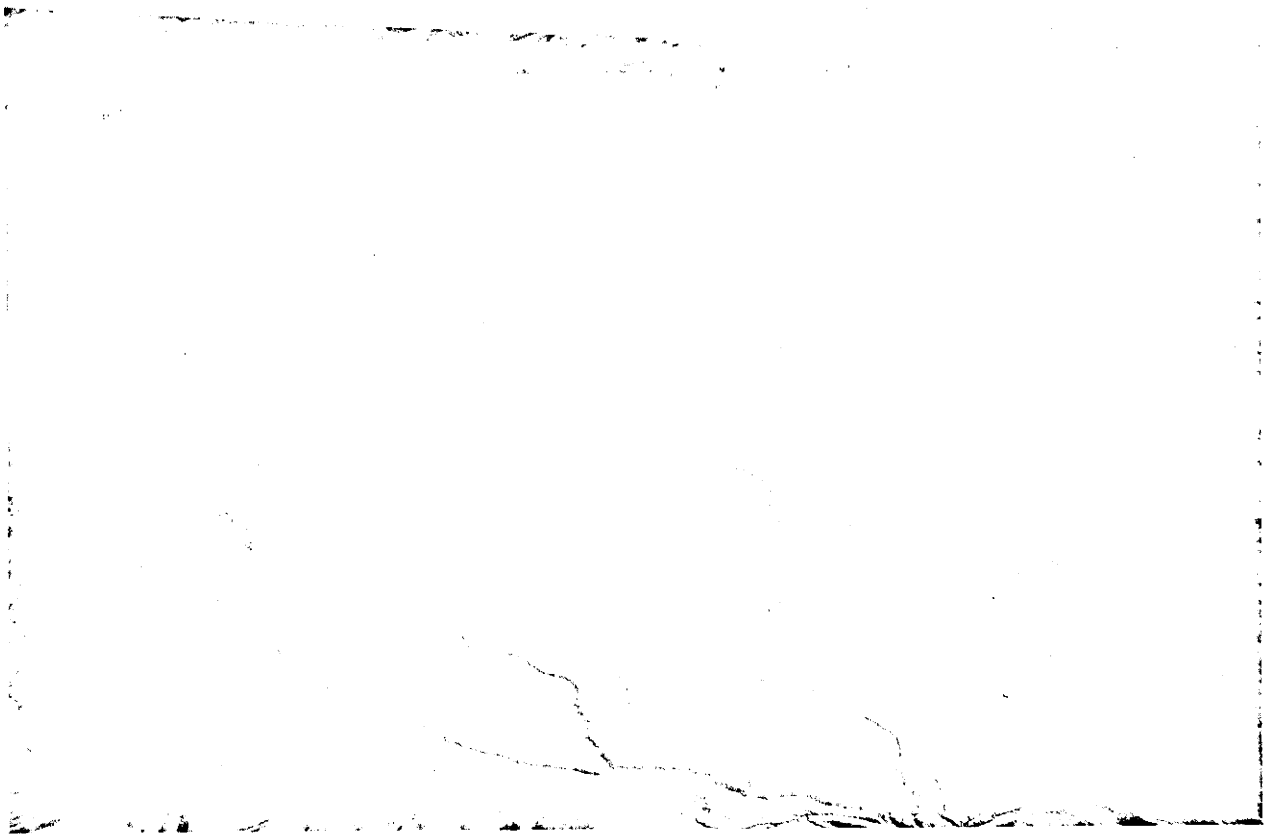

FIGURE 4

An aerial view of the Bostwick Park farmlands looking southeast. State Highway 50 can be seen at the right of the picture leading to Cerro Summit.

watershed protection. Most of the project lands that are now receiving project water are used to produce livestock feed as in the past. Small acreages of grazing land have been converted to farmland.

The lands in Bostwick Park are entirely involved in agricultural production. There are small isolated tracts of public lands above and below the park but within the valley itself there is none. The lands are mostly utilized in grazing or the production of feed for livestock. Approximately 80 percent of the irrigated lands are used for hay, pasture, or feed grains, with the remaining 20 percent in cash crops such as malting barley, potatoes, and beans. The non-irrigated lands are not only used for livestock grazing but also for mule deer range. The lands to be served by the proposed Bostwick and Lytle Laterals are all in the latter category. The 784 acres of land to be irrigated by the Bostwick and Lytle Laterals are all privately owned.

11. Economic Development

Agriculture is the only economic development in Bostwick Park. Livestock production accounts for most of the farm income, with smaller amounts for cash crops. There is no mining or petroleum production in the park at this time and none is predicted in the future as there are no known reserves of economic quality or quantity. Some ranchers may receive some income from big game hunting, but the amount would be small.

Without the project the economic situation of the Bostwick Park residents would only improve as farm management practices improve and as off-farm employment opportunities arise. Based on the historical trend, the number of farm families living here might show a slight reduction. In 1930 the Bostwick Park area had a peak population of 75-80 families. With the trend towards larger farm units and more efficient farming, the figure has currently dropped to about 50 resident families with others choosing to reside in Montrose.

The 1970 census indicated a population for Montrose County of 18,366, of which 11,870 people are classed as rural residents. The trade center of Montrose had 6,496 people and the nearby town of Olathe had 756. About 50 farm families live in Bostwick Park.

The city of Montrose experienced a growth of 29 percent between 1960 and 1970, primarily due to the location there of several government offices. The rural population of the county, on the other hand, showed a reduction of 10 percent due to the trend of consolidation of small farms into larger units.

There is presently a trend for small industry to locate in and around Montrose. The Russell Stover Candy Company has just begun construction of a large plant there. This will undoubtedly stimulate the

growth rate for the city. It could possibly slow the consolidation of farms by providing off-farm employment and making part-time farming more attractive.

C. ENVIRONMENTAL IMPACT OF THE PROPOSED ACTION

1. Impacts of the Completed Segments of the Project

Based on the total estimated cost, approximately 87 percent of the Bostwick Park Project has been completed. A brief summary of the environmental impacts of the completed segment of the project follows.

a. Silver Jack Dam and Reservoir

Silver Jack Reservoir inundated several types of wildlife habitat, including streamside habitat, meadow habitat, and forest habitat. The total land inundated amounted to 290 acres. The area was utilized by big game in the summer but there has been no reduction in game numbers as there was available habitat for the animals to utilize nearby. Approximately 20 acres of commercial aspen timber were lost. About 400 acres of grazing land, including land inundated and land required for recreation facilities, will be lost for this use.

Stream fishing in the reservoir basin was lost and a flat-water fishery has been created. Plankton now flourish and will form the base of the reservoir's food chain. There are sedimentary geologic formations and livestock grazing upstream from the reservoir both of which will enhance the productivity of the reservoir. Aquatic insect species adapted to the stream will disappear but will still be washed in by tributary streams.

The Colorado Division of Wildlife is managing the fishery of the reservoir and stock it annually with fingerling rainbow trout which will feed primarily on plankton. A stocking rate of 200 to 500 fish per acre is now used and annual gill-net surveys are conducted to gather information concerning future management. So far suckers have not been reported from the reservoir. At this early stage, Division of Wildlife personnel are optimistic about the productivity and feel that a valuable reservoir fishery could be created. The main concern is the size of the fishery pool in the late season of dry years.

Figure 3 in Section B6 illustrates the effect the reservoir has had on flows of Cimarron Creek below the Cimarron Diversion Dam. High erosive spring flows and minimum winter flows have been reduced and late summer flows increased or maintained. The effect of this change in the streamflow regimen has been to reduce and control bankside erosion from heavy spring runoffs,

and improve the streams' esthetics by maintaining higher flows later in the summer. The minimum flows to maintain the fish habitat and improve the fishery as discussed in Section B-5 were recommended after a study by the Bureau of Sport Fisheries and Wildlife in conjunction with Colorado State Division of Wildlife. They have been included in the project plans since the January 1961 Feasibility Report for the Bostwick Park Project. The turbidity on Cimarron Creek, in its upper reaches below the Silver Jack Reservoir, has been reduced as a result of the settling effect of the reservoir. Because of the contribution of uncontrolled downstream tributaries--particularly Little Cimarron Creek. Cimarron Creek still discharges considerable suspended material into the Gunnison River. Water temperatures in this high altitude stream have remained the same as under preproject conditions.

The impact on recreation cannot be determined at this early date. Campgrounds located in the vicinity that existed prior to Silver Jack's completion have not shown an increase in use that can be attributed to the reservoir. The impact on the area from future recreational development would have to be determined after the Forest Service's final plans have been made available.

Revegetation efforts continuing on disturbed areas around the reservoir and Forest Service officials hope that it will be completed in 1973. A lack of topsoil has hindered the revegetation so far. The riprap quarry has left a long-lasting scar. The "Ridge" borrow area has left a scar that should be obliterated if revegetation work is successful.

b. Project lands

The completed segment of the project serves approximately 5,025 acres of already-irrigated and new land. During the 1971 irrigation season, project water was delivered to 28 farm units. Data are not complete for 1972, but it is estimated that 35-40 farms received water. Most of this land is supplemental land and the following table illustrates the anticipated increase in crop yields per acre due to project development.

Anticipated Crop Yields

Crop	Unit per acre	With Project: End of development period	With Project: 15-20 years after development period	Without Project
Alfalfa	Ton	3.5	4.3	3.0
Barley (malting)	Bu.	58.0	70.0	58.0
Potatoes	Cwt.	245.0	260.0	215.0
Pasture	AUM.	7.1	8.4	5.5
Oats	Bu.		80.0	65.0
Wheat	Bu.		60.0	50.0
Beans	Cwt.		20.0	17.34

The increased productivity of the project lands benefits the local farmers as well as the economy of the entire area in the form of more business to agricultural service firms and other local merchants. An increase in tax base would take place for all those who benefit, either directly or indirectly, resulting in some public benefits.

New lands totaling approximately 525 acres are now being developed and served under existing distribution systems. These lands are all privately owned and were in pinon-juniper, sagebrush, or improved grassland vegetation types. This land produced forage for both livestock and wildlife. The lower elevation lands served as winter range for mule deer and is being lost for this purpose. Because the tracts are small and scattered, deer herds will not be significantly affected although slight reductions in deer numbers may occur because of the reduced carrying capacity of the winter range.

Through evaporation, evapotranspiration, and deep percolation the project would deplete the flows of the Colorado River up to a maximum of 4,000 acre-feet annually, and slightly increase the salinity of the Lower Colorado River. It is estimated that supplemental and new irrigation of Bostwick Park lands combined with stream depletions would increase the total dissolved solids in the Colorado River below Hoover Dam by less than 0.5 mg/l. Present salinity in the Colorado River at that point averages about 745 mg/l.

2. Impacts of Completing the Project's Construction

a. Bostwick Lateral

The construction of the Bostwick Lateral would cause a small temporary stimulation of the local economy due to the employment of workers and the purchase of construction materials and supplies from local merchants.

During the construction period there would be localized pollution from machinery exhausts, burning, and dust. Specifications would require that these activities be controlled so as to be within Federal and State air quality standards. Noise from machinery could be a temporary disruptive influence to livestock, wildlife, and some of the closer farm families. The commitment of the small amount of construction materials would have little economical impact on the local supply of such resources.

A minor effect on the traffic on U.S. Highway 50 and Colorado Highway 347 could be expected from slow moving trucks hauling concrete, pipe, riprap, and supplies. Increased traffic would also result from workers driving to and from the site.

It is likely that a local firm would furnish transit mix concrete as less than 100 cubic yards would be required for each lateral. Aggregate from one of three commercial deposits, already approved by the Bureau of Reclamation, would be used for the concrete. Therefore, new borrow areas would not be necessary for aggregate.

Two of the sources are near Montrose and obtain their raw materials from the flood plain of the Uncompahgre River. The third source is near Delta, Colorado, and uses material from the Gunnison River flood plain. None of these pits obtain aggregate direct from the river channel. They are currently complying with all State and Federal anti-pollution requirements.

Areas cleared along the 50- to 60-foot-wide right-of-way to permit construction of the two laterals would be subject to erosion temporarily until the vegetative cover was restored and the ground surface again stabilized.

Of the 25.6 acres required for right-of-way, the land to be cleared for the Bostwick Lateral amounts to about 20 acres of sagebrush and grass with an occasional Utah juniper or pinon pine. The 1.1-mile-long siphon across Lower Bostwick Park would be buried beneath presently irrigated and pastured fields between the East and West Vernal Mesa Ditches and beneath new fields to be irrigated out of the lateral above the West Ditch. Farming operations would be disrupted during placement of the siphon across existing farmland and some perennial crops would have to be replanted over the siphon.

The primary environmental effect of this feature would result from the irrigation of approximately 482 acres of land. This land is under sagebrush-grass cover and produces an estimated 50 AUM's (animal-unit-months) of dryland livestock grazing. With irrigation this grazing and also wildlife habitat would be lost. Mule deer utilize this area for winter range which is an important limiting factor for deer in western Colorado. It is estimated that under irrigation the land would produce about 4.3 tons of alfalfa per acre or the equivalent of 10 AUM's per acre. Developing the land as pasture would produce about 8.4 AUM's per acre.

The only recreational impact from the construction of this lateral and development of lands under it would be on hunting. There would be a slight reduction in deer and small game hunting, but there could be a slight increase in waterfowl and cottontail rabbit hunting opportunities.

The esthetic impact of the Bostwick Lateral would be minor as the lateral would have a low profile, would be on a comparable elevation with the adjacent fields, and there would be a minimum of

cuts, fills, and spoil piles. More than a third of the lateral would be in buried pipe under cultivated fields and would be completely concealed. The expanse of sagebrush rangeland would be reduced and the amount of irrigated land would be increased.

The operation of the Bostwick Lateral would have no effect on streamflows except that return flows in the Bostwick drains would be increased. Irrigation of the new land would add dissolved solids to return flows and would increase the salinity in the Colorado River at Hoover Dam by approximately 0.09 mg/l.

b. Lytle Lateral

As with construction of the Bostwick Lateral, there would be a temporary stimulation of the local economy due to the construction of Lytle Lateral. During construction there would be temporary pollution from machinery exhausts, burning, and dust. Other impacts during construction would be similar to those described above for the Bostwick Lateral.

Most of the terrain which the Lytle Lateral would cross is steep and irregular. Exposed earth cut slopes would be subject to erosion due to the steep cross slopes along the lateral. Excavation for the lateral would produce more material than required for embankments and backfills, resulting in excess material for disposal. The spoil piles would have an esthetic impact and would be subject to erosion.

Earth lining would be required for the lateral and a borrow area would be opened near the potential irrigated area just west of Highway 347. This would temporarily increase erosion and cause an esthetic impact. Coarse rock protective material and concrete aggregate would come from existing commercial sources and should have no significant environmental impact.

Approximately 34 acres of land would be acquired as right-of-way for the lateral including an estimated 32 acres to be cleared. The slopes are covered with pinon-juniper growth intermixed with sagebrush and oakbrush.

The Lytle Lateral would irrigate 302 acres of rangeland and eliminate dry land grazing on the area which amounts to about 50 AUM's. Also lost would be mule deer winter range which is fully utilized in this area. The action would force the deer herd into a slightly smaller natural habitat and probably result in a reduction in the herd size. Other species of wildlife utilizing the proposed lands would experience a similar reduction in numbers. There are no rare or endangered species that would be directly affected by construction of this lateral or any other project feature.

With the addition of irrigation water most of the land would be used for production of livestock feed and forage. These irrigated lands would produce more livestock feed than what is now realized from the same lands by native grazing. Native grazing on these sagebrush lands is rated at approximately 0.1 AUM per acre. It is estimated that cultivation of the land would produce about 4.3 tons of alfalfa per acre or the equivalent of 10 AUM's per acre. Developing the land as pasture would produce about 8.4 AUM's per acre.

As with the Bostwick Lateral the only recreational impact from construction of the Lytle Lateral would be a reduction in deer hunting and an increase in the hunting of species adapted to agricultural habitat such as the cottontail rabbit.

The esthetic impact of the Lytle Lateral would be noticeable. This would include the impact of the operation and maintenance road that would have to be constructed along the entire lateral. A portion of the lateral line would be visible to people traveling to the Black Canyon of the Gunnison National Monument on Highway 347 from the time they enter Bostwick Park until they cross the lateral about 2 miles further north. To the east of the highway the alignment would be along the steeper part of the escarpment between Bostwick Park and Vernal Mesa. The cross section is small and much of the alignment is in buried siphon, but a swath would have to be cleared through the pinon-juniper and oakbrush cover. Width of the swath would vary with the ground cross slope, buried depth of pipe, and other local factors. The operation and maintenance road would have to be continuous through the sites of the siphons. Much of this reach would also be visible on the return trip from Black Canyon. A 302-acre tract of grassland with scattered sagebrush to the west of the highway would be converted to irrigated cropland.

Operation of the Lytle Lateral would have no significant effect on streamflows. Due to the contribution of salts from the irrigated land the salinity at Hoover Dam would be increased by approximately 0.06 mg/l.

c. Rehabilitation of Bostwick Drains

During the construction phase of the rehabilitation work there would be a minor amount of air pollution from dust generated by machinery movement on disturbed lands. There would also be a minor increase in noise in the area. Work in the drains would temporarily increase the suspended sediments in the drainage water and there would be some deposition downstream. Creation of new access to certain areas of the drains would result in a temporary disturbance of farmland resulting in a minor erosion potential. Disturbed areas would be reseeded to accelerate the

establishment of a vegetation cover. There would be a temporary reduction in wildlife use of the drains during construction and until disturbed areas were stabilized.

Erosion would be reduced along the ditch banks and in the bottom of the drains by the construction of the planned surface-inlet structures and dikes and placement of the rock drop structures. This would be the most significant environmental aspect of the drainage improvement. It should reduce the loss of soil from Bostwick Park by preventing the soil from being carried into Red Rock Canyon Creek, the Gunnison River, or existing irrigation ditches. The improved drainage could decrease the area utilized by waterfowl and other wetland species. The drop structures would limit movement of fish along the drain but would probably not eliminate them. The depth of the water table in the park should not be significantly affected by the rehabilitation of the drains. There should be no esthetic losses associated with the project and a reduction in the present erosion problems would be an esthetic benefit.

d. Economic Considerations

With the construction of the two laterals and the furnishing of an assured water supply the productivity of the land in Bostwick Park would be increased. Accordingly, the income of about 10 farm families to be served by the laterals should show a substantial increase resulting in a higher standard of living for them. This in turn would have a beneficial affect on the economy of the entire area in the form of more business to agricultural service firms and other local merchants. An increase in the tax base would take place for all those who benefit, either directly or indirectly, resulting in some public benefits. No other economic impacts are foreseeable from construction of these laterals.

D. ALTERNATIVES TO PROPOSED ACTION

At this point in time the available number and type of alternatives to the proposed action are controlled by the amount of work that has already been completed on the Bostwick Park Project. Approximately 87 percent of the total project cost has already been expended providing facilities for storage, regulation, and delivery of the water supply to the location of the proposed lateral turnouts. Existing distribution systems are already being used to distribute approximately 80 percent of the project water supply. Assuming that completed features would continue to operate with their intended objective, the following analysis gives the environmental impacts and project effectiveness that can be expected under the various alternatives.

1. Nondevelopment

Under the alternative of nondevelopment, neither the Bostwick nor Lytle Laterals would be constructed nor would the drainage improvement work be adopted as part of the project. Some of the drain cleaning would have to be done at an early date and as the water users were able to make their own funds available. This course of action would only remedy part of the drainage problem and would not include some of the major features presently proposed.

If neither the Bostwick nor Lytle Laterals were constructed an existing economic hardship would be perpetuated on those farmers proposed to be served and who need additional irrigated land to provide a broader base to help stabilize their operations. Indirect benefits forecast as a result of construction of these features would not accrue to local merchants, service industries, and tax-supported agencies.

Water scheduled for use on the lands under these laterals and already contracted for with the water users, would become available to them for other purposes. Possible uses for this water might be development of other lands outside the Bostwick Park, sale to other farmers or municipalities, supplemental irrigation on presently irrigated lands, or increasing the storage in the reservoir that is reserved for maintaining minimum flows for the downstream fishery. Development on other lands would still require some type of irrigation distribution system with impacts similar to those under the proposed plan. Additional municipal water could be delivered to the city of Montrose at the existing Cerro Reservoir to improve the supply to that community's water system. Existing irrigated lands in the Bostwick Park area are already being provided a supplemental supply under the project. It is possible that they could have need for a late season supply in dry years. In the event the water users did not elect to use the water earmarked for these two laterals, a new contract would have to be negotiated and the repayment schedule for Silver Jack Dam altered. The reservoir storage available to maintain minimum fishery flows (1,720 acre-feet) already slightly exceeds the 1,500 acre-feet recommended by the Bureau of Sport Fisheries and Wildlife in the 1961 Feasibility Report.

If new lands proposed for irrigation are not developed, it is possible that farmers would continue to clear brush and trees from the 784 acres under the Bostwick and Lytle Laterals and convert them from natural grazing for deer and cattle to improved grasslands suitable only for domestic livestock.

If the Bostwick and Lytle laterals are not constructed, an estimated $50,000 spent for investigations and designs would have to be charged to abandoned investigations and paid for from power revenues from the Colorado River Storage Project.

The adverse esthetic impact of placing the Lytle Lateral along pinon-juniper and oakbrush hillsides would not result under this alternative.

2. Elimination of Lytle Lateral

Because the greatest environmental damage under the proposed action would occur from construction of the Lytle Lateral, its elimination presents an alternative to be considered. This would require balancing the value of the esthetic damage from construction of 4.4 miles of lateral across the face of the pinon-juniper and oakbrush hillsides against conversion of 302 acres of sagebrush-covered flats into cultivated farmland. Development of these lands would have a greater effect on displacing wildlife than those to be serviced by the Bostwick Lateral. Livestock and deer would continue to use these lands if Lytle Lateral were not constructed.

It is estimated that lands served by the Lytle Lateral would contribute about 0.066 mg/l dissolved solids to the Colorado River at Hoover Dam. Elimination of this increment would be a minor part of the total project contribution.

3. Alternate Feature Locations

During the planning process, various feature locations, characteristics, and water service areas were considered for the two laterals before the proposed plan was selected.

a. One alternative considered was to run the Bostwick Siphon to the south end of the lateral instead of to the present bifurcation point 0.6 miles to the north. It would require a longer siphon and capacity of 15 c.f.s. in the initial stretch of the lateral instead of the 5 c.f.s. presently proposed. Both alignments would cross under similarly cultivated land. However, waste material to be disposed of from the larger-capacity lateral would have increased visual impact from the higher canal bank and waste areas. Waste water control would be concentrated at only one end of the lateral rather than at the ends of the two branches.

b. In the original proposal for Lytle Lateral a smaller capacity (2.5 c.f.s.) extension to the proposed lateral was included which would have doubled the lateral length but provided service to an additional 158 acres near the northern end of Bostwick Park. The extension would double the esthetic impact of the proposed lateral since it would be constructed across similar pinon-juniper and oakbrush hillsides. Economic benefits to be derived from developing the new land also would not counterbalance the excessive construction cost of the lateral extension.

4. Lytle Lateral Pump Plant

In order to eliminate most of the esthetic impact of Lytle Lateral construction across the hillside, an alternative plan of delivery would be to construct a small pumping plant to deliver water from the East Vernal Mesa Ditch directly to the lateral. This would eliminate all of the ditch east of Highway 357. This plan would require lifting 10 c.f.s. of water 450 feet in elevation over a horizontal distance of nearly 1 and 1/2 miles.

This plan would have the advantage of being cheaper to construct; however, the operation and maintenance costs with the pumping system would be considerably higher.

5. Alternative Water Supply

In lieu of delivering water from a surface supply, an alternative source of water which may be considered would be pumping from groundwater in the area. The underlying formation in the Bostwick Park area is a Mancos shale which does not usually produce water in quality or quantity suitable for irrigation development. No subsurface investigations have been conducted but geological conditions are such that there may be some limited subsurface water suitable for irrigation. An ancient stream deposited a layer of silt and gravel, known as the Florida Gravels, on the relatively impervious Mancos shale which underlies the park. These gravels range from 50-100 feet in depth. The underlying Mancos shale is a poor water conductor and what little water it could produce would have a high salinity. It is doubtful that there would be sufficient water in the gravels to provide a permanent water supply for all project lands and expensive pumping would be required.

Use of groundwater would lower the water table that has been raised by irrigation. Irrigation has resulted in a high water table and artesian pressures on about 190 acres in 3 tracts near the lower end of the park. Use of groundwater would lower water table and increase productivity of these acres. Also waterfowl use of this area would be reduced if water table was lowered.

Assuming that sufficient underground water could be found, extra O&M costs associated with pumping would also make this alternative unattractive.

6. Buried Pipe Distribution System

In lieu of open-type laterals, buried concrete pipe may be considered to provide a low pressure distribution system for the project. This alternative would eliminate most of the visual impact and all of the safety hazard associated with open waterways.

The Bostwick Lateral would require moving the turnout from the East Vernal Mesa Ditch further upstream in order to provide sufficient head to operate the system. Further, the north and south branches of the lateral would have to be relocated further west in order to serve by gravity the same lands served by the presently proposed open lateral. This new alignment would be further into the denser juniper and pinon growth which borders the edge of the mesa so that clearing for the lateral would be more obvious.

Adequate head is available to place all of the Lytle Lateral in pipe without relocating the turnout and the pipeline would still basically follow the presently proposed alignment. There would still be the visible cleared swath along the lateral alignment even though ground cover vegetation would be restored in time. However, there would not be the exposed earth surfaces of cuts and lateral embankments that would be apparent with the open lateral section.

Preliminary estimates indicate that the buried pipe distribution system would cost approximately twice what is estimated for the open laterals, even though approximately already one third of the laterals are already in pipe siphons. O&M for a closed system would be considerably less. Since the rest of the existing distribution system uses open ditches, the District would still have to maintain equipment and personnel for this type of maintenance.

THE STATE HISTORICAL SOCIETY OF COLORADO

Colorado State Museum, 200 Fourteenth Avenue, Denver 80203

6 June 1972

Mr. J. W. Robins
Project Manager
Grand Junction Projects Office
Region 4
Bureau of Reclamation
P. O. Box 1728
Grand Junction, Colorado 81501

Re: GF-150, 770. Bostwick Park Project

Dear Mr. Robins:

Although there are Indian pictographs and petroglyphs in the river canyons scattered throughout the proposed project area, we know of no specific significant historic or prehistoric sites or structures which will be adversely affected by the work proposed under the above referenced project.

We ask that all discoveries of pictographs, petroglyphs or other evidence of Indian habitation be brought to the attention of:

Mr. Murray Mayfield
Director
Historical Museum and Institute of
Western Colorado
4th and Ute
Grand Junction, Colorado 81501

Mr. Mayfield is qualified to evaluate the finds with respect to preservation, photographing, or other action.

Sincerely,

W. E. Marshall
Executive Director

cc: Mr. Mayfield

United States Department of the Interior
BUREAU OF RECLAMATION
UPPER COLORADO REGIONAL OFFICE
P.O. BOX 11568
SALT LAKE CITY, UTAH 84111

APR 20 1973

IN REPLY
REFER TO 205
120./

Mr. Harry R. Woodward, Director
Division of Wildlife
Department of Natural Resources
6060 Broadway
Denver, Colorado 80216

Dear Mr. Woodward:

Enclosed for your review and comment is a copy of an environmental assessment prepared for completion of the Bostwick Park Project in West-Central Colorado. This assessment has been prepared in order to identify the environmental impacts that would result from completing the few remaining project features as well as summarizing cumulative impacts from the total project to date. Based on our analysis and the comments received from this review, a decision will be made as to whether a negative determination of environmental impact will be appropriate or a formal environmental statement must be prepared and processed in accordance with provisions of the National Environmental Policy Act of 1969.

The major feature of the project, Silver Jack Dam and Reservoir, was completed in 1970. A 1,790-foot-long deteriorated pipe siphon on the Vernal Mesa Ditch has also been replaced this year. These features represent approximately 87% of the total project cost. Storage in Silver Jack Reservoir is permitting delivery of 80% of the project water supply to lands below existing distribution systems. As described in the assessment, the remaining work includes construction of two small laterals and improvements to the existing drainage system.

We have received data from your Southwest Regional Office in Montrose for use in this assessment and they have already been furnished a copy of the enclosed report. Any additional comments from your office would be appreciated.

Sincerely,

R. L. Stevens

Regional Engineer

Enclosure

bc:
Project Manager, Grand Junction, Colorado
Construction Engineer, Montrose, Colorado
150 and 205