PASKENTA-NEWVILLE UNIT

CENTRAL VALLEY PROJECT
C A L I F O R N I A

Status Report on a Plan for Water Supply Development

AUGUST 1973

DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

United States Department of the Interior
BUREAU OF RECLAMATION

MID-PACIFIC REGIONAL OFFICE
2800 COTTAGE WAY
SACRAMENTO, CALIFORNIA 95825

IN REPLY
REFER TO: MP-723
123.4

MAR 21 1977

Mr. Michael J. Barkley
2531 E. 16th Street, No. 12
Oakland, California 94601

Dear Mr. Barkley:

Please find enclosed a copy of our status report entitled Paskenta-Newville Unit, Central Valley Project, California, dated August 1973, as requested by your letter of February 27, 1977. Since the completion of the status report, no additional information has been developed.

We are sorry that we did not followup by sending you this report as we promised in our letter of July 28, 1972.

Sincerely yours,

Donald G. Dewan

Acting Regional Planning Officer

Enclosure

PASKENTA-NEWVILLE UNIT

CENTRAL VALLEY PROJECT
C A L I F O R N I A

STATUS REPORT ON A PLAN FOR WATER SUPPLY DEVELOPMENT

THIS REPORT WAS PREPARED PURSUANT TO FEDERAL RECLAMATION LAWS (ACT OF JUNE 17, 1902, 32 STAT. 388 AND ACTS AMENDATORY THEREOF OR SUPPLEMENTARY THERETO). PUBLICATION OF THE FINDINGS AND RECOMMENDATIONS HEREIN SHOULD NOT BE CONSTRUED AS REPRESENTING EITHER THE APPROVAL OR DISAPPROVAL OF THE SECRETARY OF THE INTERIOR. THE PURPOSE OF THIS REPORT IS TO PROVIDE INFORMATION AND ALTERNATIVES FOR FURTHER CONSIDERATION BY THE BUREAU OF RECLAMATION, THE SECRETARY OF THE INTERIOR, AND OTHER FEDERAL AGENCIES.

AUGUST 1971

REVISED AUGUST 1973

BUREAU OF RECLAMATION

MID-PACIFIC REGION

SACRAMENTO, CALIFORNIA

PREFACE

Since the investigation of Paskenta-Newville Unit was terminated with completion of the August 1971 status report, no additional studies have been made.

Changing circumstances, such as the impact on the Central Valley Project and the State Water Project of the Delta quality criteria contained in Decision 1379 and 68-17 of the California State Water Resources Control Board, could warrant reactivation of the Paskenta-Newville Unit, Central Valley Project, at some future date.

August 1973

STATISTICAL SUMMARY

PROJECT:

Paskenta-Newville Unit, Sacramento River Division, Central Valley Project, California.

LOCATION:

North of Sacramento, California, in Tehama and Glenn Counties.

NEED FOR DEVELOPMENT:

Additional water supplies for the Central Valley Project will be required at the Sacramento-San Joaquin Delta to meet projected requirements in the future.

In the local Paskenta-Newville service area, water is needed for agriculture, recreation and fish and wildlife enhancement. The area is hampered by its inadequate ground-water resources and surface water supplies for irrigation, and by its lack of protection from damaging floods. Development of the land and water resources of the area is needed to create new economic opportunities and thus realize the area's ultimate potential.

PROJECT FACILITIES AND SERVICE:

Water supplies would be obtained from storage and diversion at Paskenta Reservoir on Thomes Creek and Newville Reservoir on North Fork Stony Creek. Unit functions would include irrigation, flood control, fish and wildlife mitigation and enhancement, and recreation. Water would be delivered to the local service area for local irrigation of 10,700 productive acres; and, through integrated operation with other Central Valley Project reservoirs and coordination with the State Water Project, 400,000 acre-feet would be made available at the Delta for Central Valley Project use.

With a firm irrigation supply, livestock, orchard, and field crop enterprises would be considerably enhanced, providing a stable agricultural economy for the area. The design and operation of the unit facilities would protect against a flood of once-in-50-year frequency, and furnish measurable protection against greater floods. Recreation use would be developed at both reservoirs, where fisheries would be created. Facilities would be provided for boating, fishing, camping, picnicking, hiking, and swimming.

Statistical Summary

HYDROLOGY:

	Paskenta Reservoir		Newville Reservoir
Source of water	Thomes Creek		Thomes and North Fork Stony Creek
Drainage area above damsite (square miles)	191		55
Annual runoff at damsite (acre-feet)			
Average (1921-65)	196,000		26,000[a]
Minimum	(1924) 32,500	(1964)	3,000
Maximum	(1958) 456,400	(1958)	60,000[a]
Recorded flow (c.f.s.)			
Minimum	0		0
Maximum (12/22/64) (peak)	37,800		12,800
Period of record (years)	1921-65		1964-65
Inflow design flood peak (c.f.s.)	97,000		18,400[b]
Volume (acre-feet)	200,000		28,900[b]
Period (hours)	72		56

[a] Estimated flows.

[b] Inflow from the basin above Newville only. Total inflow would also include the routed outflow from Paskenta. The total inflow to Newville would have a peak of 97,200 cubic feet per second and a 72-hour volume of 228,900 acre-feet.

LAND CLASSIFICATION:

Local service area	Gross classified	Arable	Irrigable	Productive (rounded)
		(a c r e s)		
Paskenta	45,266	10,509	9,995	9,500
Newville	7,668	1,579	1,473	1,200
Unit total	52,934	12,088	11,468	10,700

Statistical Summary

WATER REQUIREMENTS, SUPPLIES, AND DELIVERIES:

	Reservoir (acre-feet)		
Water Requirements	Paskenta	Newville	Total
Irrigation	33,200	4,250	37,450
M&I	0	0	0
Water rights (existing local diversions)	21,500	7,000	28,500
Local Supply			
Ground water	1,000	0	1,000
Surface water	0	0	0
Total	1,000	0	1,000
Use of Project Water Supply			
Irrigation	38,000	5,000	43,000
Streamflow maintenance and ground-water recharge	8,000	0	8,000
Downstream requirement	12,000	7,000	19,000
Available for export to Delta	0	400,000	400,000
Reservoir release	58,000	412,000	470,000

PRINCIPAL FEATURES:

Dams and Reservoirs	Paskenta	Newville
General		
Location	Thomes Creek, 26 miles west of Corning, Calif.	North Fork Stony Creek, 18 miles west of Orland, Calif.
Drainage area (square miles)	191	55
Dam		
Type	Rolled earth and rockfill	Rolled earth, sand and gravelfill
Height above streambed (feet)	233	390
Crest length (feet)	1,500	5,100
Crest elevation (feet)	1,023	989

PRINCIPAL FEATURES: (continued)

Spillway

Type	Uncontrolled crest	Gated weir in dike L-2
Crest elevation (feet)	1,006	960.0
Design peak outflow (c.f.s.)	90,000	17,830
Surcharge (acre-feet)	23,400	140,950
Maximum water surface elevation (feet)	1,017.4	983.3

Outlet Works

Total capacity (c.f.s)	1,400	4,500

Reservoir	Paskenta	Newville
Capacity (acre-feet):		
Joint use	-	80,000
Active conservation	112,200	2,806,600
Inactive and dead	17,600	100,100
Total	129,800[a]	2,986,700[a]
Elevation (feet) at full reservoir	1,006	974.85
Surface area (acres)	1,943	16,560

[a] Includes future sediment reservations of 27,000 and 6,300 acre-feet.

Canals	Length (miles)	Capacity (c.f.s.) Initial	Terminal
Paskenta South	15	151	19
Paskenta North	20	69	23
Burch Creek	4.5	45	14
Black Butte-Sacramento River Conveyance	14.0	2,500	

Channelization of 3.9 miles of Rice Creek is required in addition to the Black Butte-Sacramento River Conveyance.

PRINCIPAL FEATURES: (continued)

Pumping Plant

	Units	Total capacity (c.f.s.)	Static lift (feet)	Motor horsepower
Newville	3	11	0-166	425

Distribution System

Concrete pipe (15-2 c.f.s.)	Length (miles)
Paskenta	71.2
Newville	14.2

LAND REQUIREMENTS:

	Private land, fee title	Public land	Total
	(a c r e s)		
Dams and reservoirs	24,008	557	24,565
Recreation area	2,489	1,396	3,885
Wildlife mitigation area	2,455	0	2,455
Canals, conduits, and structures	725	0	725
Total	29,677	1,953	31,630

CONSTRUCTION COSTS:
(January 1970 prices)

Main project facilities	$136,589,000
Recreation lands and facilities	5,513,000
Fish and wildlife lands and facilities	596,000
Subtotal	$142,698,000
Distribution system	7,071,000
Total construction cost	$149,769,000

ANNUAL OM&R COSTS:

Main project facilities	$125,200
Wildlife mitigation lands	7,500
Recreation land and facilities	321,000
Water rights	5,000
Subtotal	$458,700
Distribution system	85,500
Total annual OM&R costs	$544,200

ECONOMIC JUSTIFICATION:
(100 years at 5-1/8 percent interest)

Benefits

	Direct	Total
Irrigation		
Local	$ 1,221,000	$ 1,752,000
Export[a]	10,718,000	23,999,000
Subtotal	$11,939,000	$25,751,000
Recreation & reservoir fishery	325,000	325,000
Wildlife	4,000	4,000
Flood control	610,000	610,000
Total annual equiv. benefits	$12,878,000	$26,690,000

[a] Based on an average of completed projects using Delta-oriented water supplies.

Costs

Project cost (PF-2)	$149,769,000
Interest during construction	16,552,000
Total capital investment	$166,321,000
Less: Investigation costs	-300,000
Net capital investment	$166,021,000
Discounted net capital investment	163,382,000
Annual equivalent net capital investment	8,431,000
Annual equivalent operating costs	365,000
Total annual equivalent costs	$ 8,796,000

Benefit-Cost Ratio

Benefits	$12,878,000	$26,690,000
Costs	8,796,000	8,796,000
Ratio of benefits to costs	1.5:1.0	3.0:1.0

C O N T E N T S

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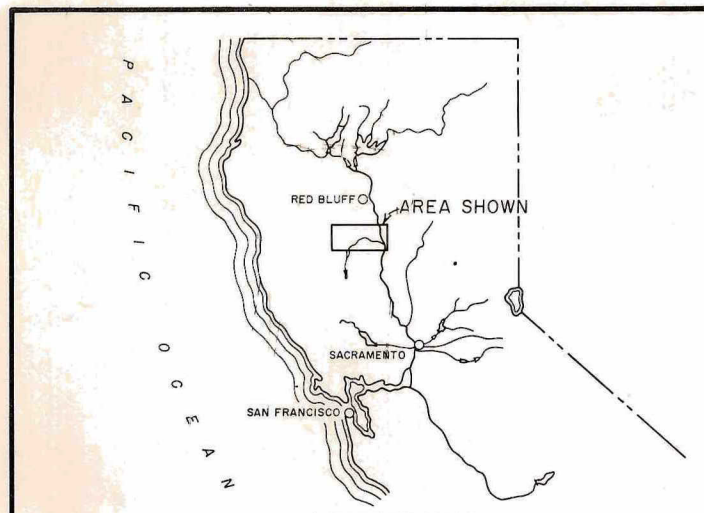


LOCATION MAP

N

Dam and reservoir
Canal
Pipeline
Siphon
Pumping plant
Area boundary

0 1 2 3 4 5
MILES

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

CENTRAL VALLEY PROJECT
SACRAMENTO R. DIV. - PASKENTA-NEWVILLE UNIT - CALIF.

PLAN OF DEVELOPMENT

DECEMBER 1967

1107-208-94

PASKENTA NORTH LATERAL
SOUTH PASKENTA CANAL
SOUTH PASKENTA LATERAL
NORTH PASKENTA CANAL
HOUGHTON CREEK LATERAL
BURCH CREEK CANAL
PARKER CREEK LATERAL
BURCH CREEK LATERAL
JACKSON SPRING CREEK LATERAL
Paskenta
PASKENTA DAM
PASKENTA RESERVOIR
NEWVILLE SPILLWAY
PASKENTA SPILLWAY
NEWVILLE RESERVOIR
NEWVILLE DAM
Newville
STONY CREEK REGULATING RESERVOIR
BEDFORD LATERAL
LATERAL FK
BLACK BUTTE RESERVOIR
CHROME DIKE
CORNING CANAL
CORNING
TEHAMA-COLUSA CANAL
SACRAMENTO RIVER CHANNELIZATION
SACRAMENTO RIVER CONVEYANCE
BUTTE CO.
TEHAMA CO.
GLENN CO.
STONY CANAL
ORLAND
Hamilton City
South Fork Elder Creek
Mill Creek
McCarty Creek
Thomes Creek
Salt Creek
North Fork
Stony Creek
Hunter Creek
Camp Creek
Grindstone Creek

PART I

SUMMARY

This status report outlines a possible plan for multipurpose development of the Paskenta-Newville Unit, utilizing local streamflows. The unit would provide water for export to the Delta during dry periods for use in other areas of the Central Valley Project. Resources of the Central Valley would be further enhanced as the unit would also provide a dependable agricultural water supply for the local service area, much needed flood protection, recreation, and fish and wildlife enhancement. The unit facilities could eventually be used for conveyance and enroute storage of water imported from the North Coast or the Eel River.

Although the local service area could presently benefit from water service for irrigation, together with the much needed flood protection afforded by the project, the need for increasing the Central Valley Project water supplies for export purposes does not appear immediate. A recent study of the Central Valley's water supply and water requirements indicates that sufficient water is developed by completed projects, or will be developed by projects presently under construction, or authorized to be constructed to satisfy water demands to Central Valley Project water users for about two decades, depending on the authorization and construction of conveyance facilities to present or proposed areas of need.

The export yield, when needed, would be integrated with the existing supplies of the Central Valley Project. As such, the

commingled supply is, and will continue to be, used for a variety of water services; i.e., irrigation, municipal and industrial, water quality, recreation, fish and wildlife, etc., in many locations throughout the Central Valley Project. In view of the various uses which might be made of the Central Valley Project supply including the yield of Paskenta-Newville, the water service benefits for economic justification purposes for this report are based on a representative, but conservative use, irrigation. However, in any future studies, specific assignment would be made to relate the water and associated benefits to the actual use.

AUTHORITY

This report is authorized by virtue of the Federal Reclamation Laws (Act of June 17, 1902, 32 Stat. 388, and acts amendatory thereof or supplementary thereto).

The feasibility investigation was authorized and conducted as part of the North Coast Project. Future stages of this development, involving facilities for importation of water from North Coast streams, would be similar in design and purpose to the Trinity River Division.

SUMMARY

Plate 1 presents the plan of development for Paskenta-Newville Unit.

Paskenta and Newville Reservoirs, with a combined storage capacity of over 3 million acre-feet, would store the flows of

Thomes and North Fork Stony Creeks. Releases made would meet needs of the local service area and, through integrated operation with other Central Valley Project reservoirs and the California State Water Project, provide 400,000 acre-feet of coordinated yield at the Delta. This export water could be readily utilized when the expanding Delta water needs exceed the Central Valley Project water supply capability during the late 1990's.

The local service area would receive a full water supply for 11,468 irrigable acres. With irrigation development, livestock production is expected to continue to dominate, with forage crops and some feed grains raised. About one-third of the acreage would be devoted to orchards, either almonds or olives. The agricultural economy, with irrigation development, would be diversified and stabilized.

Flood control storage of 80,000 acre-feet would provide protection from floods of once-in-50-year frequency, and minimize peak flows in larger floods.

Reservoir releases made for streamflow maintenance to satisfy water rights would provide some incidental improvement to water quality.

Facilities would be provided at the reservoirs for boating, fishing, swimming, picnicking, riding, hiking, and camping. Reservoir fisheries would be established. The unit would meet the increasing local demand for water-oriented outdoor recreation

activities and the demand of large metropolitan complexes such as Sacramento and the San Francisco Bay area.

The water supply function has the largest monetary benefit. Annual equivalent project benefits for all functions, with the benefits related to the export water, based on irrigation use as representative of all uses, are:

Irrigation	$25,761,000
Fish and wildlife	4,000
Flood control	610,000
Recreation	325,000
Total benefits	$26,700,000

The total capital investment, which includes the construction cost and interest during construction of the unit, is estimated at $166,321,000. Total annual equivalent costs (at 5-1/8 percent interest), which include amortization of project investment and the annual equivalent operation, maintenance and replacement costs, are $8,796,000.

Comparing the total annual equivalent benefits of $26,700,000 with the total annual equivalent costs of $8,796,000 results in a favorable benefit-cost ratio of 3.0 to 1.0.

Because of the unit's strategic location, the two proposed reservoirs together with an adjacent Rancheria Reservoir site, which have been designated as the "Glenn Reservoir Complex," could also be readily utilized for future regulatory storage if additional water is imported from the Trinity and Eel Rivers.

ACKNOWLEDGMENTS

Prior to the initiation of the feasibility study in June 1965, several studies had been made of conservation projects by various agencies, including the Tehama County Flood Control and Water Conservation District. Results of these studies were made available during the preparation of this report.

Other agencies actively investigating the area are the Corps of Engineers, the California State Department of Water Resources, and the Soil Conservation Service. These agencies and the Bureau of Reclamation are cooperating in their investigations through the California State-Federal Interagency Group.

The Fish and Wildlife Service, National Park Service, Bureau of Land Management, Bureau of Outdoor Recreation, Environmental Protection Agency, Corps of Engineers, Public Health Service and U.S. Forest Service have provided information relative to the multipurpose aspects of the development plan.

The cooperation of the State of California, Glenn and Tehama Counties, and the (prospective water users) is acknowledged with gratitude.

PART II

PLAN OF DEVELOPMENT

This part of the report describes the plan of development for the unit, and the possible contributions of the unit's export water supplies to the Central Valley Project. Use of the unit facilities for regulatory storage of water imported from the North Coast is discussed.

Succeeding parts of the report describe the unit's facilities, and its water supply. The area of local service and the unit's functions as they affect the local area are then described. The concluding part presents the economic justification for the overall unit.

The Paskenta-Newville Unit reservoirs are the northern two of three contiguous basins identified as the Glenn Reservoir Complex. The Rancheria Reservoir site on Stony Creek is the third. Development of this complex for regulatory storage would be one of the lowest in cost of the storage sites remaining in the Central Valley.

NEED FOR DEVELOPMENT

Additional water conservation facilities will be needed to meet the water requirements of the local service area of the Paskenta-Newville Unit, and development of additional firm yield at the Sacramento-San Joaquin Delta.

In the local Paskenta-Newville service area, water is now needed for agriculture, for recreation, and for fish and wildlife

enhancement. The area is hampered by inadequate ground-water resources and surface water supplies for irrigation, and by its lack of protection from damaging floods.

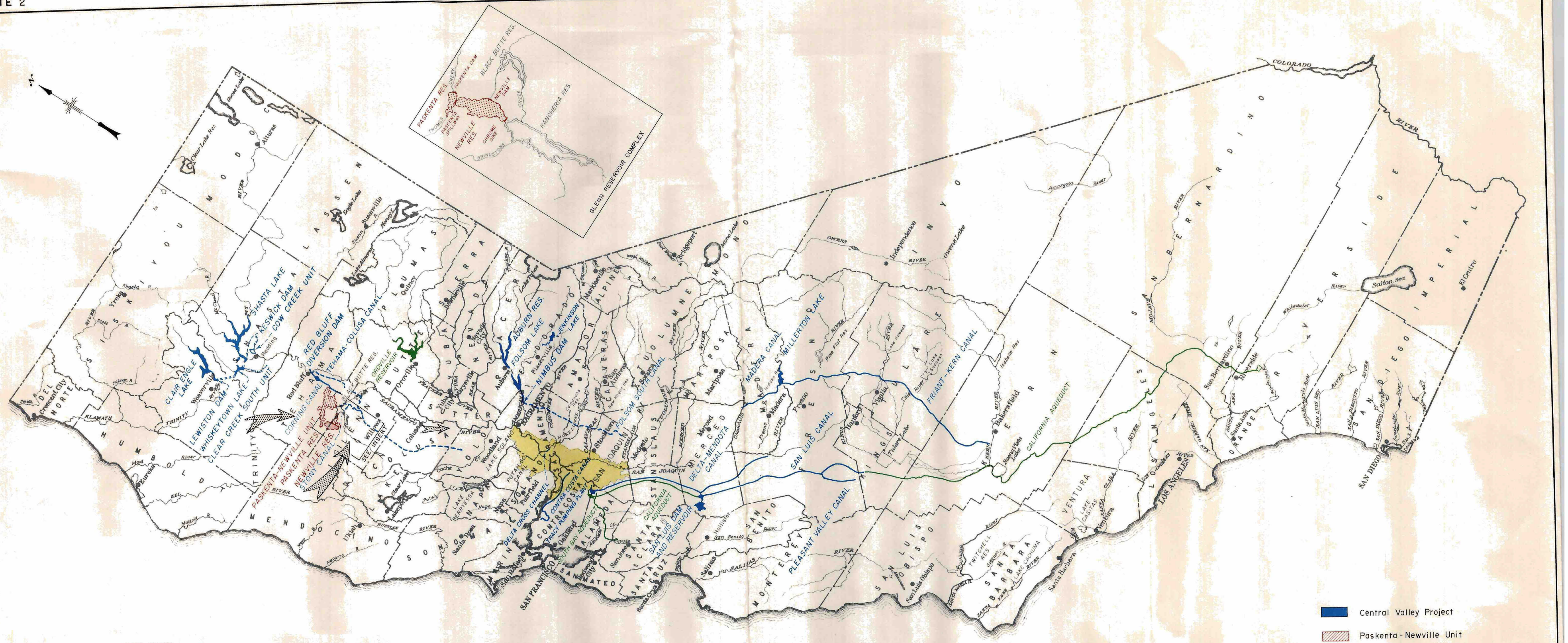
Looking toward the future, both the Bureau and the State, in their quest for additional water supplies to meet future demands as they develop will require regulatory and carry-over storage, such as that provided at Paskenta and Newville Reservoirs, to form an important link in the chain to bring water to the Sacramento Valley from future projects yet to be constructed in northwestern California.

PASKENTA-NEWVILLE UNIT

Facilities of the Paskenta-Newville Unit would conserve the flows of Thomes and North Fork Stony Creek to supply the local service area demands, and, when integrated with the Central Valley Project, produce an additional coordinated yield of 400,000 acre-feet at the Delta. The unit's functions would include water service, flood control, fish and wildlife, and recreation.

Paskenta Dam and Reservoir would store flows of Thomes Creek and divert water into the adjacent Newville Reservoir. Streamflows would initially fill Paskenta Reservoir and then be diverted across a saddle spillway between the two reservoirs. Flood control releases and spills to be made from Newville Reservoir would be returned, through a spillway at the north end of the reservoir,

PLATE 2



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

CENTRAL VALLEY PROJECT WITH PASKENTA-NEWVILLE UNIT

DECEMBER 1967

1107-208-97

to Thomes Creek below Paskenta Dam. Paskenta Reservoir would supply 38,000 acre-feet of irrigation water to the Paskenta area; Newville Reservoir would supply 5,000 acre-feet to the Newville area.

Most of the water stored in Newville Reservoir would be used for export to the Delta to firm up Central Valley Project supplies in dry periods. Export water would be released from Newville Reservoir down the North Fork Stony Creek into Black Butte Reservoir. From Black Butte Reservoir the water would flow through a conveyance channel into Rice Creek and then to the Sacramento River. Remaining flows of approximately 500 cubic feet per second during short periods of release would be conveyed down Stony Creek.

For recreation and fishery, normal minimum operating pools of 30,000 acre-feet in Paskenta Reservoir and 100,000 acre-feet in Newville Reservoir would be provided.

During dry years, releases to the Sacramento River would be exchanged between Newville Reservoir and Shasta or Trinity Reservoirs, enhancing the Central Valley Project power operation. This exchange, which would provide a small incidental added capacity, and would increase the system's average generation, was not evaluated in this report.

CENTRAL VALLEY PROJECT

A study of the water supply and water requirements for the Central Valley Project for the period 1970-2030 shows that

utilization of the present supply is dependent upon the construction of proposed conveyance and distribution facilities. It also shows that the Central Valley Project, as authorized, has an adequate water supply to meet the present needs. In 1990 the total water supply as planned is expected to be 14.8 million acre-feet, and the total requirement, assuming an outflow to the Delta of 1,800 cubic feet per second, will be 14.2 million acre-feet. By 1995, the total requirement will increase by 1 million acre-feet, and additional water from the project must be supplied at the Delta. Results of the study are summarized in table 1.

State Bulletin 160-70, "The California Water Plan Outlook in 1970" states . . . "sufficient water is developed by completed water projects or will be developed by those under construction for about two decades." . . . This conclusion is in keeping with Bureau of Reclamation projections, as shown in table 1, related to new export supplies for about the same period.

FEDERAL-STATE PLANNING COORDINATION

The California State-Federal Interagency Group--the Bureau of Reclamation, the Corps of Engineers, the Soil Conservation Service, and the Department of Water Resources--has adopted a joint work program to formulate a single plan of water resources development for the Eel and Mad River Basins. The basic agreement establishing the joint program was extended by an agreement in September 1966 on feasibility level planning of the Paskenta-Newville-Rancheria and

Table 1. Central Valley Project water supplies and requirements (acre-feet)

Year	Total supply	Total requirements[a]	Shortage
1970	13,465,950	9,525,555	
75	13,513,410	10,376,023	
80	13,798,410	11,756,038	
85	14,236,410	12,793,632	
90	14,786,410	14,248,685	
95	14,786,410	15,179,517	393,107
2000	14,786,410	16,043,362	1,256,952
05	14,786,410	16,725,030	1,938,620
10	14,786,410	17,360,220	2,573,810
15	14,786,410	17,688,420	2,902,010
20	14,786,410	18,114,420	3,328,010
25	14,786,410	18,683,920	3,897,510
30	14,786,410	19,200,920	4,414,510

[a] Assumes 1,800 cubic foot per second outflow from the Delta.

Cottonwood Creek projects on the west side of the Sacramento Valley. The September 1966 agreement is appended.

This joint approach to northern California planning assures that California's remaining water resources will be developed, providing optimum and expeditious construction of projects to meet the need for protection from floods and droughts.

IMPORT WATER

The water to meet future needs is proposed to be imported from presently undeveloped streams in California's North Coast. Facilities would be required on the Central Valley side of the Coast Ranges for regulation, operation, and flexibility in the storage and conveyance of the import water.

The Paskenta-Newville Unit reservoirs and the adjacent Rancheria Reservoir could be so utilized when import supplies are required and become available.

The three reservoirs of the Glenn Reservoir Complex could be utilized as regulatory storage facilities for water imported from the Eel River or Trinity River.

Water from Trinity River could be diverted into the Sacramento Valley by tunnel and then transported to Cottonwood Creek or by canal and a series of small reservoirs to Paskenta Reservoir. Trinity water regulated in the Paskenta-Newville Unit reservoirs and the Rancheria Reservoir could be released as required to the Sacramento River and thence to the Delta for export.

Paskenta-Newville Unit could also be a part of the Eel River import plan. The Middle Fork Eel River development plan is being investigated by the State of California and the Corps of Engineers. The proposed development included a Dos Rios Reservoir on the Middle Fork of the Eel River, a Grindstone Creek tunnel, and possibly a large Rancheria Reservoir on Stony Creek. Provision has been made in the design of Newville Reservoir for coordinated operation with Rancheria Reservoir.

PART III

PLANS AND ESTIMATES

Paskenta Dam and Reservoir would store flows of Thomes Creek and divert excess water to the adjacent Newville Dam and Reservoir. The streamflows would initially fill Paskenta Reservoir and then be diverted across a saddle spillway between the two reservoirs. Flood control releases and spills to be made from Newville Reservoir would be returned to Thomes Creek through a spillway at the north end of the reservoir. Water service would be provided to the Paskenta area from Paskenta Reservoir and to the Newville area from Newville Reservoir. Concrete-lined canals would convey water from the reservoirs to the service areas for delivery through pipe distribution systems to the farm turnouts.

Most of the water stored in Newville Reservoir would be used for export to firm up Central Valley Project supplies in dry periods. This export water would be released from Newville Reservoir down North Fork Stony Creek into Black Butte Reservoir. From Black Butte Reservoir, the water would flow through a conveyance canal into Rice Creek channel and then to the Sacramento River. Flows of approximately 500 cubic feet per second during rare occasions of maximum release would be conveyed down Stony Creek to the Sacramento River.

UNIT FEATURES

Paskenta Dam and Reservoir

Paskenta damsite on Thomes Creek is approximately 2 miles west of the town of Paskenta. The dam would be of earth and rockfill

construction, have a height of about 233 feet, and a crest length of 1,500 feet at elevation 1,023 feet.

The spillway across a low saddle would discharge into the adjacent Newville Reservoir. The spillway would be uncontrolled, with its 750-foot crest at elevation 1006, discharging down a baffled chute located in the middle of the saddle. A spillway discharge capacity of 90,000 cubic feet per second at water-surface elevation 1017.4, in combination with surcharge space of 23,400 acre-feet, would protect against a design peak flood of 97,000 cubic feet per second and a 3-day volume of 200,000 acre-feet.

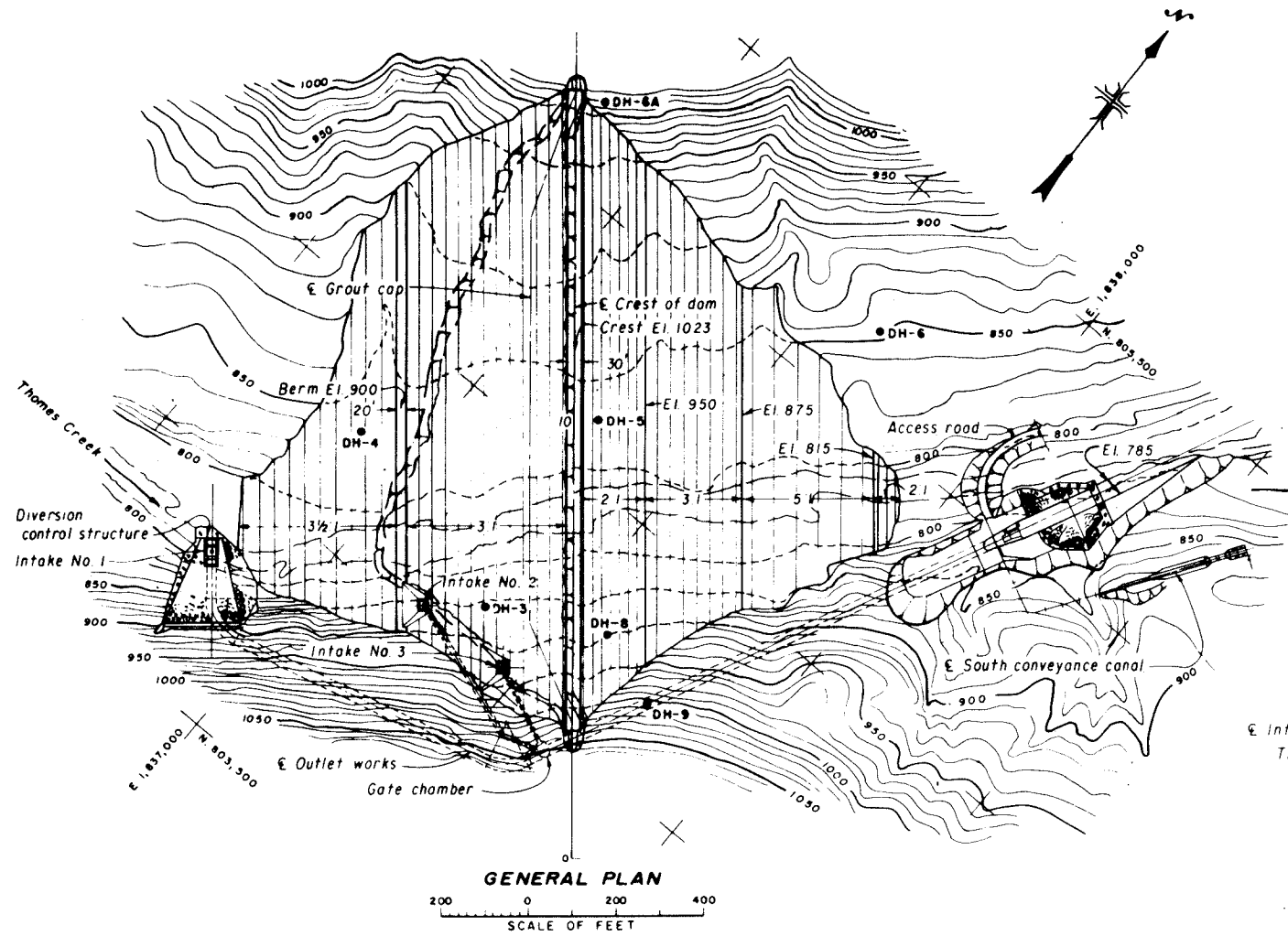
The main outlet works, located in the right abutment, would utilize the 25-foot-diameter tunnel used for river diversion during construction. Two separate upper-level intake shafts and tunnels, combined with a third low-level shaft to the diversion tunnel, would allow selective reservoir releases at the gate chamber. Beyond the gate chamber the conduit would contain a 62-inch steel pipe for releases from the low-level intake, elevation 861, and a 36-inch steel pipe for releases from the upper two intake levels at elevations 920 and 980. These pipes would extend from the gate chamber near the axis of the dam to the stilling basin. A 36-inch riser from the 62-inch steel pipe would provide for irrigation releases to the Paskenta South Canal located on the right bank of Thomes Creek. Downstream releases would be made from either pipe.

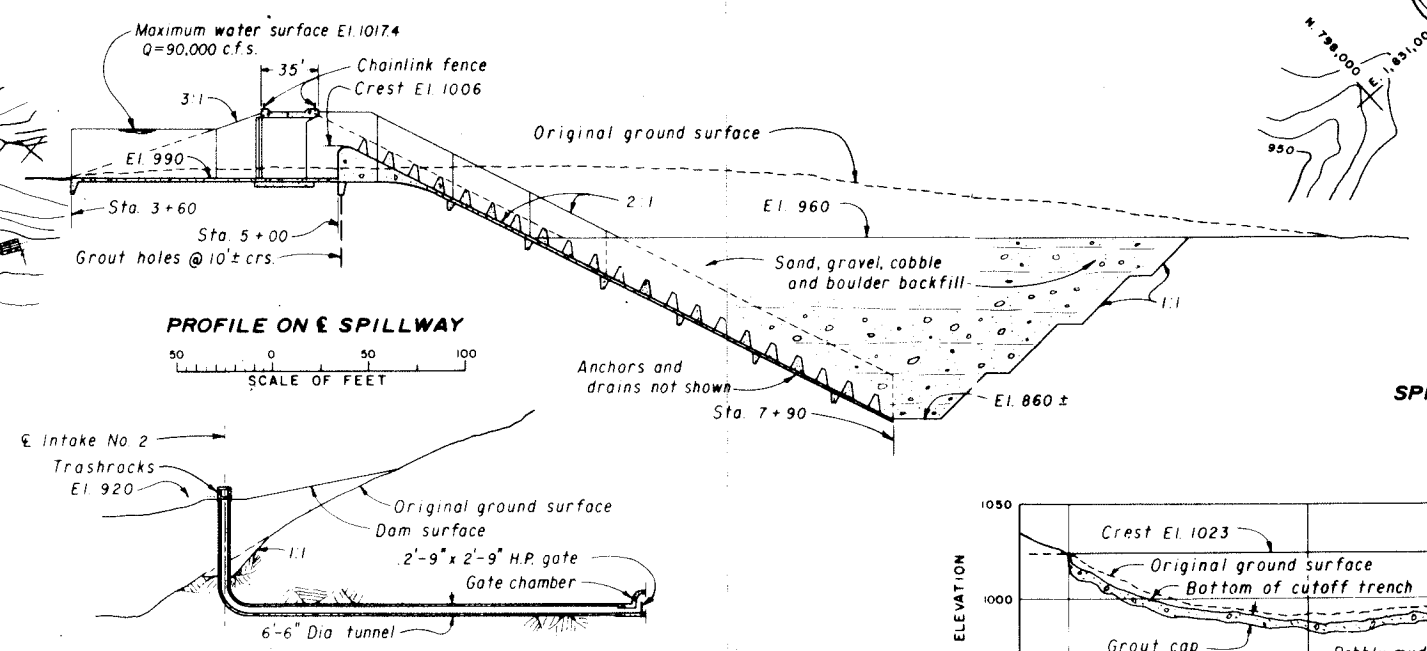
Artist's view of Paskenta Dam and Reservoir

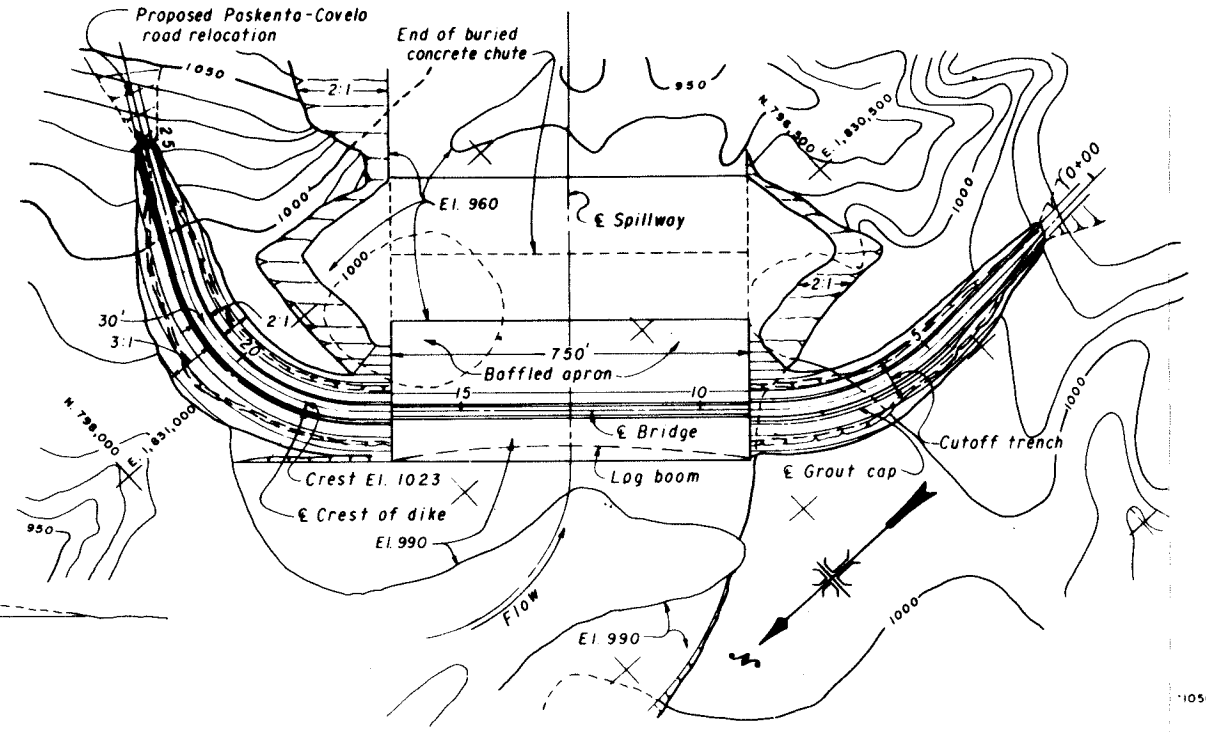
RESERVOIR CAPACITY ALLOCATIONS

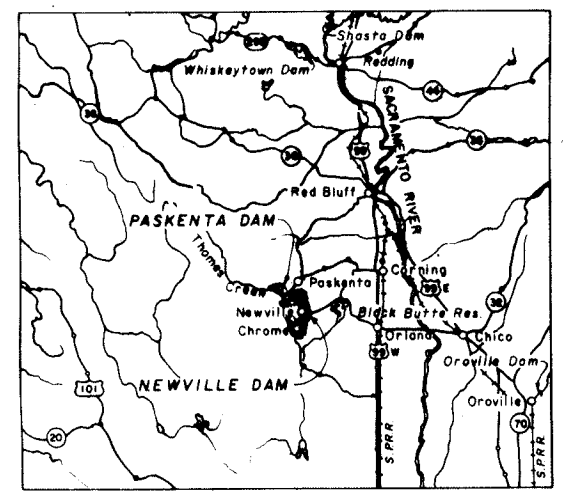
PURPOSE	ELEVATIONS	CAPACITY ACRE-FEET
Active conservation	905 to 1006	112,200
Inactive	861 to 905	12,700
Dead	795 to 861	4,900
Total reservoir capacity		129,800 *

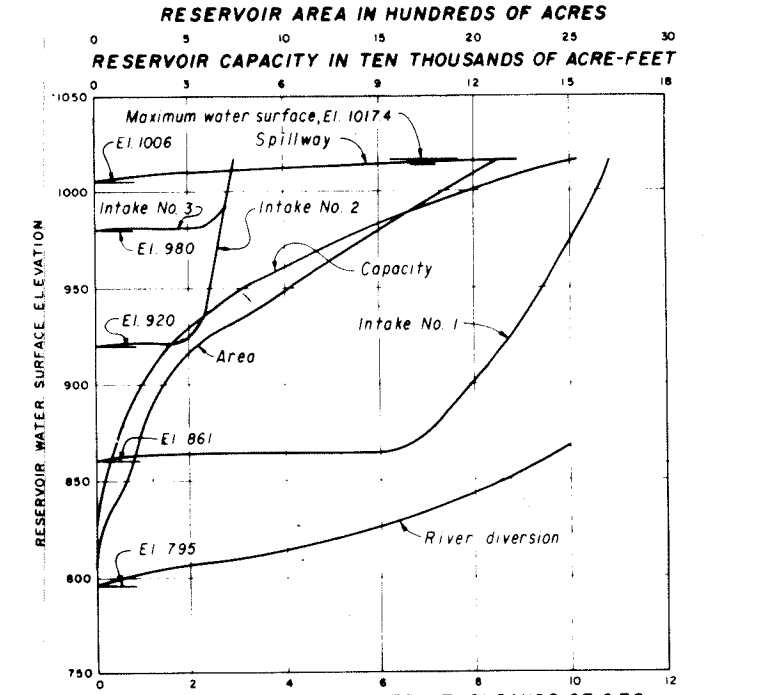
* Includes 27,000 a.f. for sediment deposition.
A surcharge of 23,372 a.f. (Maximum water surface El 1017.4 in combination with a spillway discharge of 90,000 c.f.s. is provided to protect against the inflow design flood which has a peak of 97,000 c.f.s. and 3-day volume of 200,000 a.f.

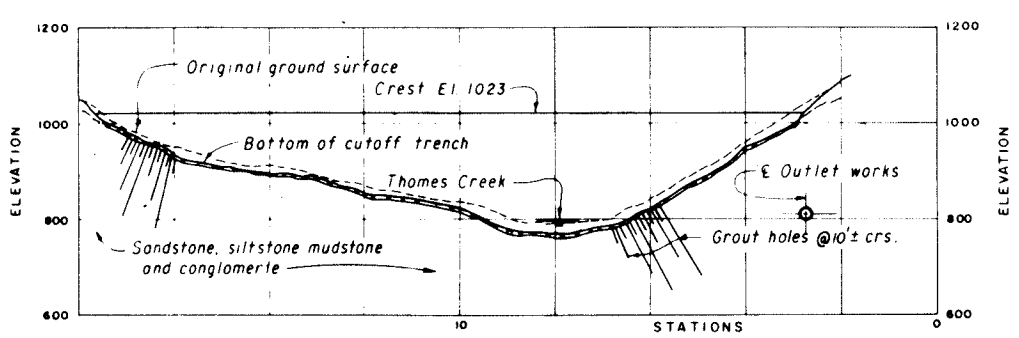


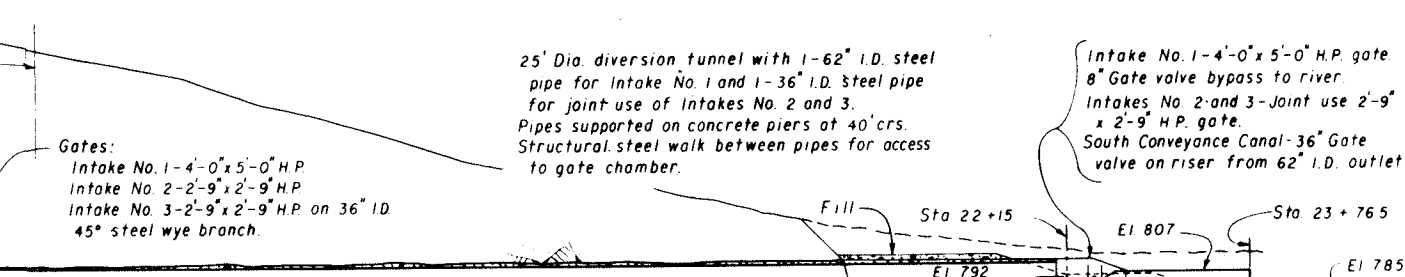


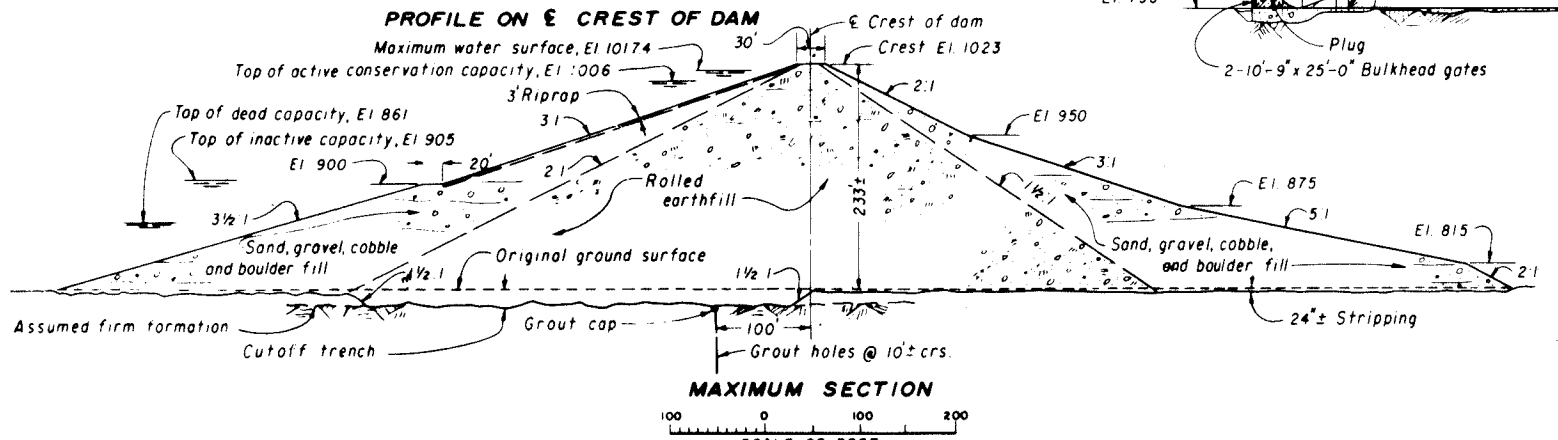


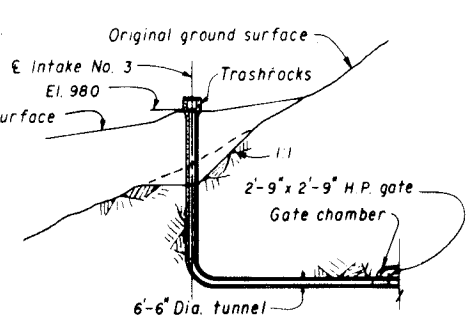


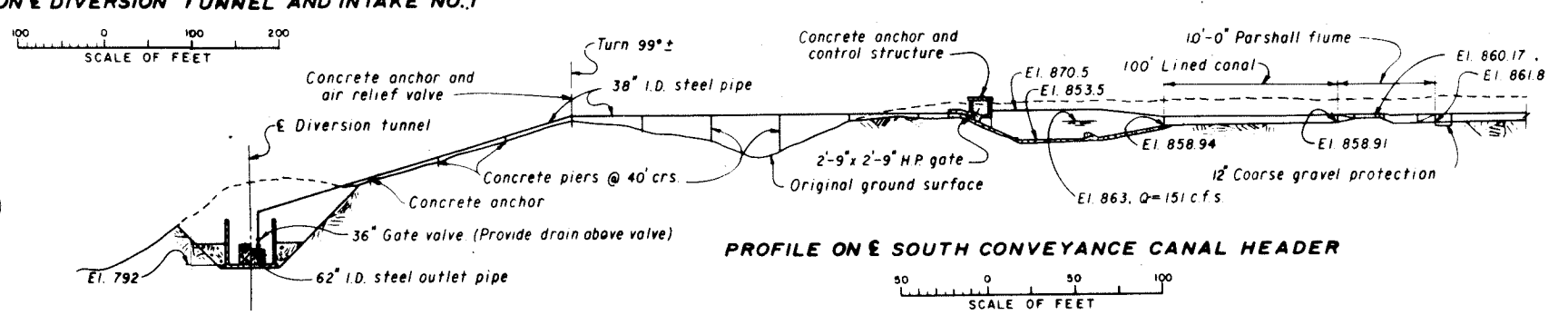












7-15-71	CHANGED TITLE BLOCK
208 - DH	
8-14-70	TRACED
D - M.C.	

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
CENTRAL VALLEY PROJECT
SACRAMENTO RIVER DIVISION
PASKENTA-NEWVILLE UNIT-CALIFORNIA
PASKENTA AND NEWVILLE RESERVOIRS

PASKENTA DAM
FEASIBILITY DESIGN DRAWING

DRAWN P.E.F. SUBMITTED P.T. Larsen
TRACED J.S.C. RECOMMENDED T.M. Hollacarin
CHECKED W.D.T.-M.A.J. APPROVED Gordon H. Johnson
ACTING REGIONAL DIRECTOR
DENVER, COLORADO AUGUST 31, 1966
SHEET 1 OF 8

1107-D-1

The reservoir would have a capacity of 129,800 acre-feet at normal water-surface elevation 1006, which includes the estimated 100-year accumulation of 27,000 acre-feet of sediment. The active conservation space would provide water for local irrigation, reservoir fishery, and recreation.

Paskenta damsite is underlain chiefly by well-lithified sandstone, sandy siltstone and conglomerate beds; some moderately lithified pebbly mudstone beds are also present. The beds strike about N. 65° E. and dip about vertical near the axis. They are cut by joints and narrow faults which are not known to be active. Shaly mudstone beds will underlie most of the right abutment, diversion tunnel and outlet works intake structures. Paskenta Reservoir is surrounded by impervious, well-indurated sedimentary and meta-igneous rocks and the possibility of seepage from the reservoir is regarded as very remote.

Table 2 lists data on the dam and reservoir; plate 3 shows the general plan of Paskenta Dam and appurtenant structures.

Newville Dam and Reservoir

Newville damsite is located at Newville on North Fork Stony Creek. The dam would be an earth, sand, and gravel fill structure with a height of 390 feet and a crest length of 5,100 feet. To complete the reservoir, Burrows Gap Dam, Chrome Dike, and four small dikes would be required. Burrows Gap Dam, 133 feet high, and three small dikes would be needed to retain water behind Rocky

Table 2. Paskenta Dam and Reservoir

General

Location	Sec 6, T. 23 N., R. 6 W, MDB&M
Drainage area (square miles)	191

Dam

Type	Rolled earth and rockfill
Height above streambed (feet)	233
Crest length (feet)	1,500
Crest elevation (feet)	1,023

Spillway

Type	Uncontrolled crest - 750 feet long
Crest elevation (feet)	1,006
Design peak outflow (c.f.s.)	90,000

Outlet works

No. 1 intake (c.f.s.)	1,100
No. 2 intake (c.f.s.)	300
No. 3 intake (jointly or separately)	

Reservoir

Purpose	Water-surface elevation (feet)	Capacity (acre-feet)
Active conservation	1,006	112,200
Inactive	905	12,700
Dead	861	4,900
Total reservoir capacity		129,800

Surface area -- 1,943 acres at elevation 1006

Ridge. Chrome Saddle Dike, with a crest length of 4,050 feet and a height of 60 feet, would prevent flow into the adjacent Grindstone and Stony Creek Basins to the south. The fourth small dike, designated Dike L-2, would be required on the northern reservoir boundary.

The Thomes Creek spillway, at Dike L-2, would be a gated chute over 1 mile in length controlled by three 15- by 15-foot radial gates. The spillway and outlet works capacities of 17,830 and 4,500 cubic feet per second, respectively, combined with a surcharge of 140,950 acre-feet, would protect against a flood (combined with Paskenta spillway outflow and Newville Reservoir inflow design flood) which has a peak of 97,156 cubic feet per second and a 3-day volume of 228,900 acre-feet.

The main outlet works, located in the right abutment, would be a 12-foot 3-inch-diameter conduit and tunnel upstream of the gate chamber and an 18-foot-diameter horseshoe tunnel downstream. The horseshoe section would contain a 12-foot 3-inch-diameter penstock which would reduce to an 8-foot steel pipe at the penstock for this potential future powerplant branch and terminate at the stilling basin. Chrome Dike was designed with a 8-foot by 6-foot conduit to provide for integrated operation with the future Rancheria Reservoir.

Diversion of North Fork Stony Creek during construction would be made through the main outlet works before installation of penstocks.

The reservoir would have a capacity of 2,986,700 acre-feet at normal water-surface elevation 974.85, with a maximum of 80,000 acre-feet of joint-use space available for flood control from September 1 to June 1 each year. Joint-use space would become available for irrigation storage starting March 1, with the total 80,000 acre-feet available by June 1. Sediment storage of 6,315 acre-feet for a 100-year accumulation would be provided in the reservoir.

Newville damsite is underlain principally by well-lithified conglomerate and sandstone beds that strike about north-south parallel to the axis and dip 60 to 75 degrees east downstream. Moderately lithified beds of shaly and pebbly mudstone with thin sandstone interbeds underlie the upstream and downstream toe areas of the dam. The beds are cut by joints and by narrow, inactive, northeast-striking faults which are not known to be active.

Seepage from Newville Reservoir is not expected to develop from the reservoir basin floor or along the northern, southern and western shorelines. The possibility of seepage along Rocky Ridge, the eastern shoreline of the reservoir, was recognized during the feasibility investigation and studied in detail. It was concluded that seepage through Rocky Ridge could be reduced to about 48 acre-feet annually by normal foundation treatment at Newville Dam and five saddle dikes and by grouting or blanketing 5,800 feet of topographic saddles and ridge segments.

Plans and Estimates

Table 3 lists data on the dam and reservoir; plate 4 shows the general plan of Newville Dam and appurtenant structures.

Pumping Plants

A pumping plant at the toe of Newville Dam would lift water a maximum of 166 feet into the Bedford Lateral when Newville Reservoir would be at minimum pool. The 425-horsepower pumping plant would contain three units with capacities of 1.9, 3.7, and 5.3 cubic feet per second. Pumping would be required only when Newville Reservoir would be below elevation 874 feet.

Power for pumping would be supplied from Central Valley Project sources, and wheeled over Pacific Gas and Electric Company lines. The power requirement would vary from zero in years when Newville Reservoir would be above elevation 874 to 226,000 kilowatt-hours in years when the reservoir would be at minimum level. Service to the rest of the local service area lands would be made by gravity.

Canals

Paskenta South Canal would begin at the outlet works on the right abutment of Paskenta Dam and extend east along the south side of Thomes Creek. It was sized to convey 151 cubic feet per second initially and would reduce to 15 cubic feet per second at its termination into the lateral system beyond Burch Canal. Paskenta South Canal would provide service to the area along the south side of the Thomes Creek, and make deliveries to the Paskenta North and Burch Creek Canals.

Table 3. Newville Dam and Reservoir

General

Location	Sec 3, T. 22 N., R. 6 W., MDB&M
Drainage area (square miles)	55

Dam

Type	Rolled earth, sand, and gravel fill
Height above streambed (feet)	390
Crest length (feet)	5,100
Crest elevation (feet)	989

Spillway

Type	Gated weir, three 15x15' radial gates
Crest elevation (feet)	960
Design peak outflow (c.f.s.)	17,830[a]

Outlet works

North Fork Stony Creek (c.f.s.)	4,500
Pumping plant and distribution system (c.f.s.)	21
(By pumping - 10 c.f.s.; by gravity flow - 11 c.f.s.)	

Reservoir

Purpose	Water-surface elevation (feet)	Capacity (acre-feet)
Joint use	974.85	80,000
Active conservation	970.00	2,806,600
Inactive	704.00	99,000
Dead	634.00	1,100
Total reservoir capacity		2,986,700

Surface area - 16,560 acres at elevation 974.85

[a] At elevation 983.3, maximum water surface.