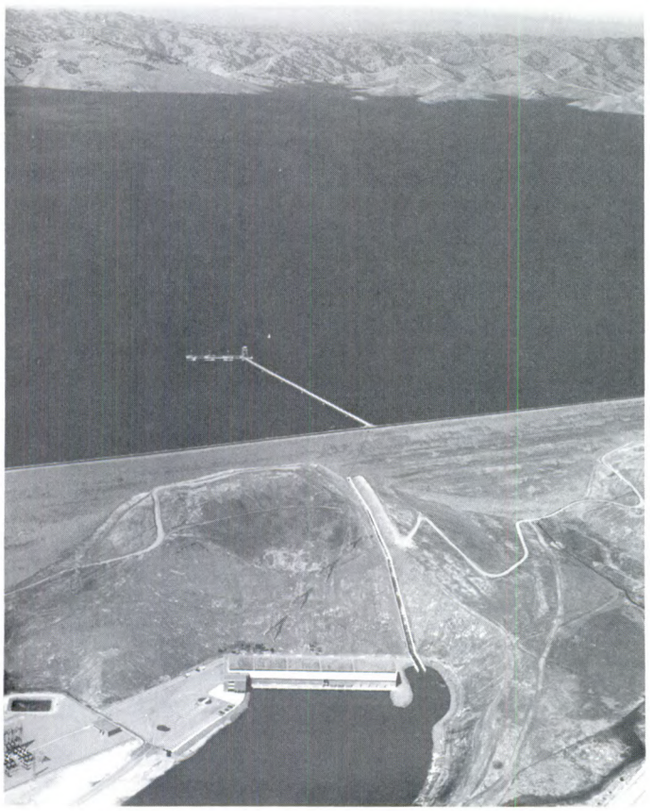
Central Valley Project
San Luis Unit, West San Joaquin Division

California: Fresno, Kings, and Merced Counties

Mid-Pacific Region
Bureau of Reclamation

The San Luis Unit, a part of the Central Valley Project and also the State of California Water Plan, was authorized in 1960 to be constructed and operated jointly with the State of California. Some features are "joint-use facilities" of the Federal Government and the State. The principal purpose of the Federal portion of the facilities is to furnish approximately 1.25 million acre-feet of water as a supplemental irrigation supply to some 600,000 acres located in the western portion of Fresno, Kings, and Merced Counties.

The major portion of the San Luis Unit is a combined effort of the Federal and State governments; 55 percent of the total cost is contributed by the State of California



San Luis Dam and Reservoir

Region Revision 10/83
(From Project Data Book)

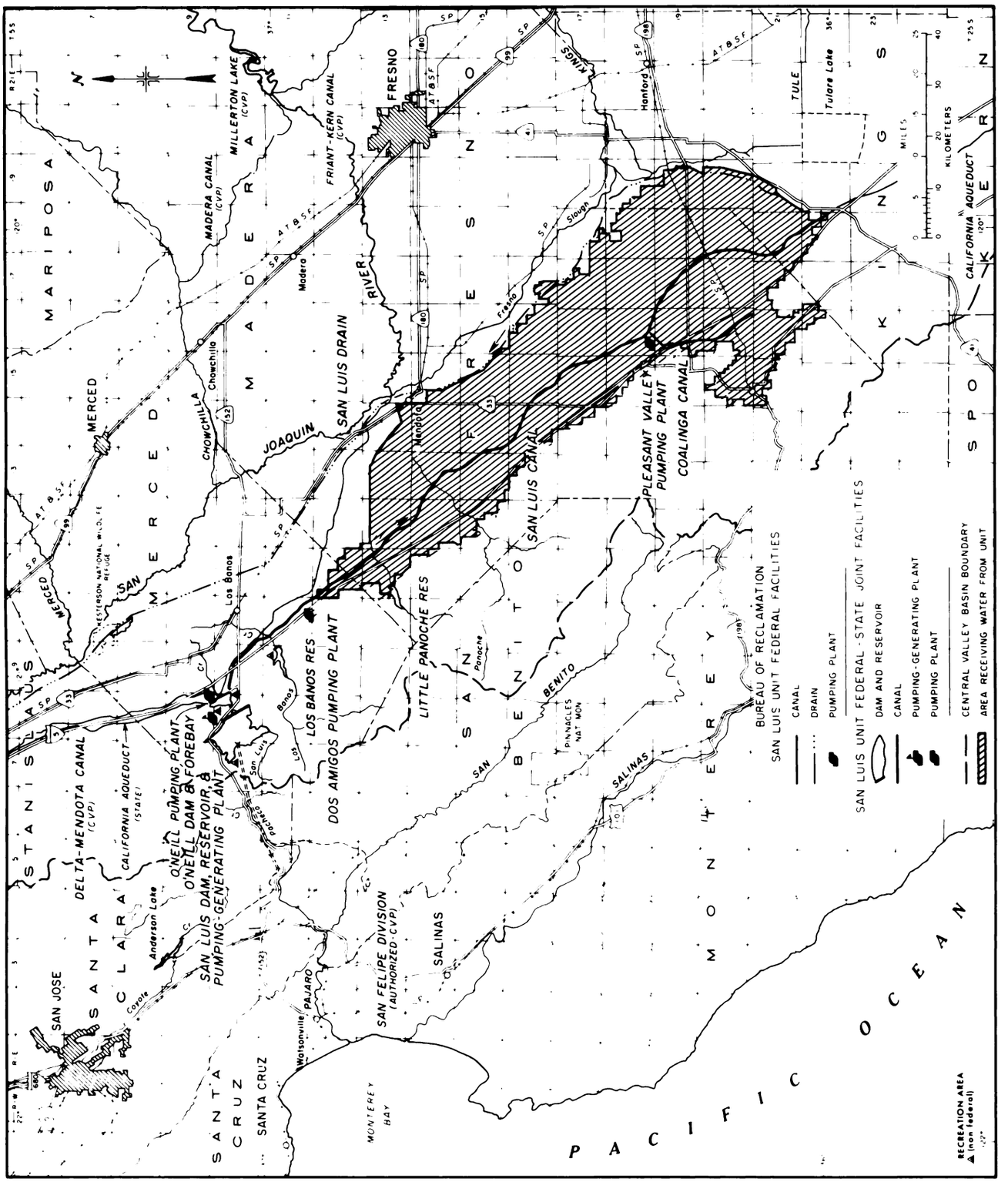
joint-use facilities are O'Neill Dam and Forebay, San Luis Dam and Reservoir, San Luis Pumping-Generating Plant, Dos Amigos Pumping Plant, Los Banos and Little Panoche Reservoirs, and San Luis Canal from O'Neill Forebay to Kettleman City, together with the necessary switchyard facilities.

The Federal-only portion of the San Luis Unit includes the O'Neill Pumping Plant and Intake Canal, Coalinga Canal, Pleasant Valley Pumping Plant, and the San Luis Drain.

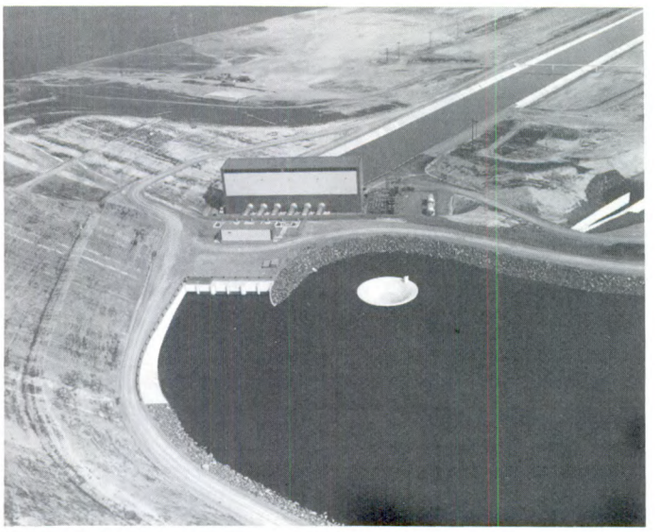
The San Luis Reservoir serves as the major storage and O'Neill Forebay acts as an equalizing basin for the upper stage dual-purpose pumping-generating plant. Pumps located at the base of O'Neill Dam take water from the Delta-Mendota Canal through an intake channel (a Federal feature) and discharge it into the O'Neill Forebay. The California Aqueduct (a State feature) flows directly into the O'Neill Forebay. The pumping-generating units lift the water from the O'Neill Forebay and discharge it into the main reservoir. When not pumping, these units generate electric power by reversing flow through the turbines. Water for irrigation is released into the San Luis Canal and flows by gravity to Dos Amigos Pumping Plant where it is lifted more than 100 feet to permit gravity flow to its terminus at Kettleman City. A State canal system continues to southern coastal areas. During irrigation months, water from the California Aqueduct flows through the O'Neill Forebay into the San Luis Canal without first being pumped into the San Luis Reservoir. Cross drainage along the San Luis Canal is achieved by two detention reservoirs, Los Banos and Little Panoche. The reservoirs provide recreation benefits in addition to flood control.

San Luis Dam and Reservoir

These joint Federal-State facilities are located on San Luis Creek near Los Banos, Calif. Completed in 1967, San Luis Dam is a zoned earthfill structure 382 feet high with a crest length of 18,600 feet. The reservoir has a



Central Valley Project, San Luis Unit



O'Neill Forebay Pumping Plant

capacity of 2,041,000 acre-feet, and is used to store surplus water of the Sacramento-San Joaquin Delta. Releases are made through the San Luis Pumping-Generating Plant, using its power generating capacity. The reservoir offers recreation facilities for fishing, boating, water skiing, and camping.

O'Neill Dam and Forebay

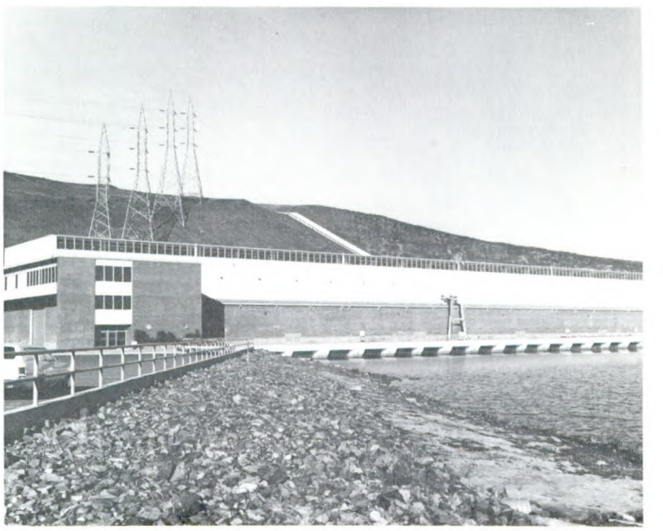
These joint Federal-State facilities are located on San Luis Creek 2.5 miles downstream from San Luis Dam. O'Neill Dam is a zoned earthfill structure with a height of 87 feet and a crest length of 14,300 feet. The forebay, with a capacity of 56,400 acre-feet, is utilized as a hydraulic junction point for Federal and State waters. The top 20,000 acre-feet act as reregulator storage necessary to permit offpeak pumping and onpeak generation by the main San Luis Pumping-Generating Plant.

Dos Amigos Pumping Plant and Switchyard

Recreation facilities are included at the forebay for picnicking, camping, swimming, boating, water skiing, and fishing.

O'Neill Pumping Plant

This Federal facility consists of an intake channel leading off the Delta-Mendota Canal, 70 miles from the Tracy Pumping Plant, and six pumping-generating units. Normally these units operate as pumps to lift water from 45 to 53 feet into the O'Neill Forebay. When water is occasionally released from the forebay to the Delta-Mendota Canal, these units will operate as generators. When operating as pumps and motors, each unit can discharge 700 cubic feet per second and has a rating of 6,000 horsepower. When operating as turbines and generators, each unit has a generating capacity of about 4,200 kilowatts.



San Luis Pumping-Generating Plant

San Luis Pumping-Generating Plant

This joint Federal-State facility, located at San Luis Dam, lifts water by pump-turbines from the O'Neill Forebay into San Luis Reservoir. During the irrigation season, water is released from San Luis Reservoir back through the pump-turbines to the forebay and energy is reclaimed. Each of the eight pumping-generating units has a capacity of 63,000 horsepower as a motor and 53,000 kilowatts as a generator. As a pumping station to fill San Luis Reservoir, each unit lifts 1,375 cubic feet per second at 290 feet total head. As a generating plant, each unit passes 1,640 cubic feet per second at the same head.

San Luis Canal

This joint Federal-State facility is a concrete-lined canal 101.3 miles long with a capacity ranging from 8,350 to

Delta-Mendota Canal and California Aqueduct

13,100 cubic feet per second. Access sites for public fishing are provided.

Dos Amigos Pumping Plant

This joint Federal-State facility, 17 miles south of the Forebay, is a relift plant in the San Luis Canal. The plant contains six pumping units, each capable of delivering 2,200 cubic feet per second at 125 feet of head.

Pleasant Valley Pumping Plant

This Federal facility lifts water 180 feet from an intake channel leading from San Luis Canal at mile 74. Three 7,000-, three 3,500-, and three 1,250-horsepower units are used to deliver 1,135 cubic feet per second into the Coalinga Canal and 50 cubic feet per second to a distribution lateral serving adjacent lands north of the pumping plant.

Coalinga Canal

This Federal facility, formerly called Pleasant Valley Canal, carries water from the turnout structure on the San Luis Canal to the Coalinga area in Fresno County. The system includes a 1.6-mile intake channel to the Pleasant Valley Pumping Plant and 11.6 miles of canal. The initial capacity of the canal is 1,100 cubic feet per second, decreasing to 425 cubic feet per second at the terminus. Reaches 1 and 2 of the canal are operated by the Westlands Water District.

Los Banos and Little Panoche Detention Dams and Reservoirs

These joint Federal-State facilities are required to protect the San Luis Canal by controlling flows of streams crossing the canal. The Los Banos Reservoir also protects the city of Los Banos and adjacent areas from damaging floods and provides recreation facilities for picnicking, camping, swimming, fishing, and boating.

San Luis Drain

The San Luis Drain, a Federal facility, is designed to convey and dispose of subsurface irrigation return flows from the San Luis service area. A feature of the drain is the Kesterson Reservoir where water is ponded, regulated, and allowed to evaporate pending approval and construction of an outlet for the San Luis Drain. The reservoir serves in the conservation and management of wildlife and recreation, and is designated as a national wildlife refuge. Eighty-seven miles of the planned 188-mile-long drain have been completed.

Distribution System

A system of laterals and relift pumping facilities to take water from the San Luis Canal and convey it to over 583,000 irrigable acres is being constructed by the Bureau of Reclamation.

PROJECT DATA

Land Areas (1982)

Irrigable area:		
Supplemental irrigation service	594,351	acres
Temporary irrigation service	321	acres
Number of irrigated farms	364	

Facilities in Operation

Storage dams	4	
Canals	115	mi
Tunnels	1.8	mi
Pumping plants	39	
Drains	84	mi
Pumping-generating plants	2	
Substations[1]	3	

[1]Includes Dos Amigos and San Luis Substations, operated by the State of California.

Climatic Conditions

Annual precipitation	14.5	in
Temperature:		
Maximum	115	°F
Minimum	19	°F
Mean	59	°F
Growing season	280	days
Elevation of irrigable area	310.0	ft

Settlement

Number of persons served with project water (1982):	
Farm irrigation service	683
Urban and suburban irrigation service	10,474
Municipal and other water service	11,000
Total	22,157

ENGINEERING DATA

Water Supply

San Luis Creek

Drainage area	84.6	mi²
Annual discharge:		
Maximum (1952)	17,030	acre-ft
Minimum (1961)	58	acre-ft
Average	4,260	acre-ft

Storage Facilities

San Luis Dam[2]

Type: Zoned earthfill		
Location: On the San Luis Creek 12 mi west of Los Banos, Calif.		
Construction period: 1963-67		
Reservoir, San Luis:		
Total capacity to El. 544	2,040,540	acre-ft
Active capacity, El. 326-544	1,961,320	acre-ft
Surface area at El. 544	13,000	acres
Shoreline	65	mi
Dimensions:		
Structural height	382	ft
Hydraulic height	303	ft
Top width	30	ft
Maximum base width	2,420	ft
Crest length	18,600	ft
Crest elevation	554.0	ft
Total volume	77,670,000	yd³
Spillway: Concrete morning-glory inlet, concrete conduit, concrete chute, concrete stilling basin, and outlet channel.		
Crest elevation	544.0	ft
Capacity, El. 545.8	875	ft³/s
Outlet works: Four concrete conduits controlled by roller-mounted gates and bulkhead gate in the trashrack structure; connected to four dual-purpose pump-generators.		
Capacity at El. 544	13,120	ft³/s

O'Neill Dam

Type: Zoned earthfill		
Location: On San Luis Creek 12 mi west of Los Banos, Calif.		
Construction period: 1963-67		
Reservoir, O'Neill Forebay:		
Total capacity to El. 225	56,430	acre-ft
Active capacity, El. 217-225	20,790	acre-ft
Surface area at El. 225	2,250	acres
Shoreline	14	mi
Dimensions:		
Structural height	87	ft
Hydraulic height	61	ft
Top width	30	ft
Maximum base width	382	ft
Crest length	14,300	ft
Crest elevation	233.0	ft
Total volume	2,880,000	yd³
Spillway: Concrete morning-glory inlet, concrete conduit, concrete chute, stilling basin, and outlet channel.		
Crest elevation	225.0	ft
Capacity, El. 228	3,300	ft³/s

Little Panoche Detention Dam[2]

Type: Zoned earthfill		
Location: On Little Panoche Creek.		
Construction period: 1965-66		
Reservoir, Little Panoche:		
Total capacity to El. 641.5	5,580	acre-ft
Active capacity, El. 590-641.5	5,270	acre-ft
Surface area at El. 641.5	188	acres
Shoreline	10	mi
Dimensions:		
Structural height	151	ft
Hydraulic height	86	ft
Top width	30	ft
Maximum base width	660	ft
Crest length	1,440	ft
Crest elevation	676.0	ft
Total volume	1,160,000	yd³
Spillway: Morning-glory inlet with concrete conduit leading to concrete stilling basin equipped with flipbucket and baffled apron.		
Crest elevation	641.5	ft
Capacity, El. 670.4	3,220	ft³/s
Outlet works: Concrete intake structure leading to concrete conduit, terminating together with the spillway into the stilling basin.		
Capacity at El. 670.4	1,040	ft³/s

Los Banos Detention Dam[2]

Type: Zoned earthfill		
Location: On Los Banos Creek above the San Luis Canal.		
Construction period: 1964-65		
Reservoir, Los Banos:		
Total capacity to El. 353.5	34,600	acre-ft
Active capacity, El. 296-353.5	26,300	acre-ft
Surface area at El. 327.8	470	acres
Shoreline	12	mi
Dimensions:		
Structural height	167	ft
Hydraulic height	126	ft
Top width	30	ft
Maximum base width	830	ft
Crest length	1,370	ft
Crest elevation	384.0	ft
Total volume	2,110,000	yd³
Spillway: Approach channel, concrete crest structure, and concrete chute leading to concrete stilling basin.		
Crest elevation	353.5	ft
Capacity, El. 378.2	8,600	ft³/s
Outlet works: Concrete intake structure connecting to a concrete conduit, then to concrete-lined tunnel. Flow empties into concrete chute and stilling basin. Flow controlled by two 3.5-ft-square high pressure gates.		
Capacity at El. 378.2	1,255	ft³/s
Foundation special treatment: Single grout curtain with grout cap placed on bottom of cutoff trench. Also, grout curtain through spillway crest structure cutoff.		

[2]Operated by California Department of Water Resources.

Carriage Facilities

San Luis Canal

Location: From O'Neill Forebay south to Kettleman City, Calif.		
Construction period: 1963-68		
Length	101.3	mi
Capacity	13,100	ft³/s
Section (initial reach):		
Bottom width	110	ft
Side slopes	2:1	
Water depth	32.8	ft

Coalinga Canal

Location: From above the Pleasant Valley Pumping Plant, extends southwest and somewhat parallel to the San Luis Canal.		
Construction period: 1968-73		
Length	11.6	mi
Capacity	1,100	ft³/s
Section (initial reach):		
Bottom width	12	ft
Side slopes	1.5:1	
Water depth	11.3	ft

O'Neill Forebay Inlet Channel

Construction period: 1965-66		
Length	0.5	mi
Capacity	4,200	ft³/s
Section:		
Bottom width	80	ft
Side slopes	1.5:1	

Pleasant Valley Intake Channel

Construction period: 1968-69		
Length	1.6	mi
Capacity	1,140	ft³/s
Section:		
Bottom width	12	ft
Side slopes	1.5:1	
Water depth	11.8	ft

Pacheco Tunnel, Reach 1

Location: From inlet in San Luis Reservoir west under the reservoir.		
Construction period: 1964-68		
Length	9,540	ft
Capacity	670	ft³/s
Cross section:		
Diameter	12.5	ft
Lining type: Circular		
Lining thickness	8-18	in

O'Neill Pumping-Generating Plant

Number of units	6	
Total capacity	4,200	ft³/s
Total dynamic head	44-56	ft
Total horsepower	36,000	

San Luis Pumping-Generating Plant

Number of units	8	
Total capacity	11,000	ft³/s
Total dynamic head	290	ft
Total horsepower	504,000	

Dos Amigos Pumping Plant

Number of units	6	
Total capacity	13,200	ft³/s
Total dynamic head	107-125	ft
Total horsepower	240,000	

Pleasant Valley Pumping Plant

Number of units	9	
Total capacity	1,185	ft³/s
Total dynamic head	197	ft
Total horsepower	35,250	

San Luis Water District Pumping Plants

Number of pumping plants	7	
Number of units in each plant	4-6	
Total capacity of each plant	31-103	ft³/s
Total dynamic head of each plant	162-264	ft
Total horsepower of each plant	1,100-3,000	

Westlands Water District Pumping Plants

Number of pumping plants	28	
Number of units in each plant	4-8	
Total capacity of each plant	23-152	ft³/s
Total dynamic head of each plant	77-295	ft
Total horsepower of each plant	1,000-5,000	

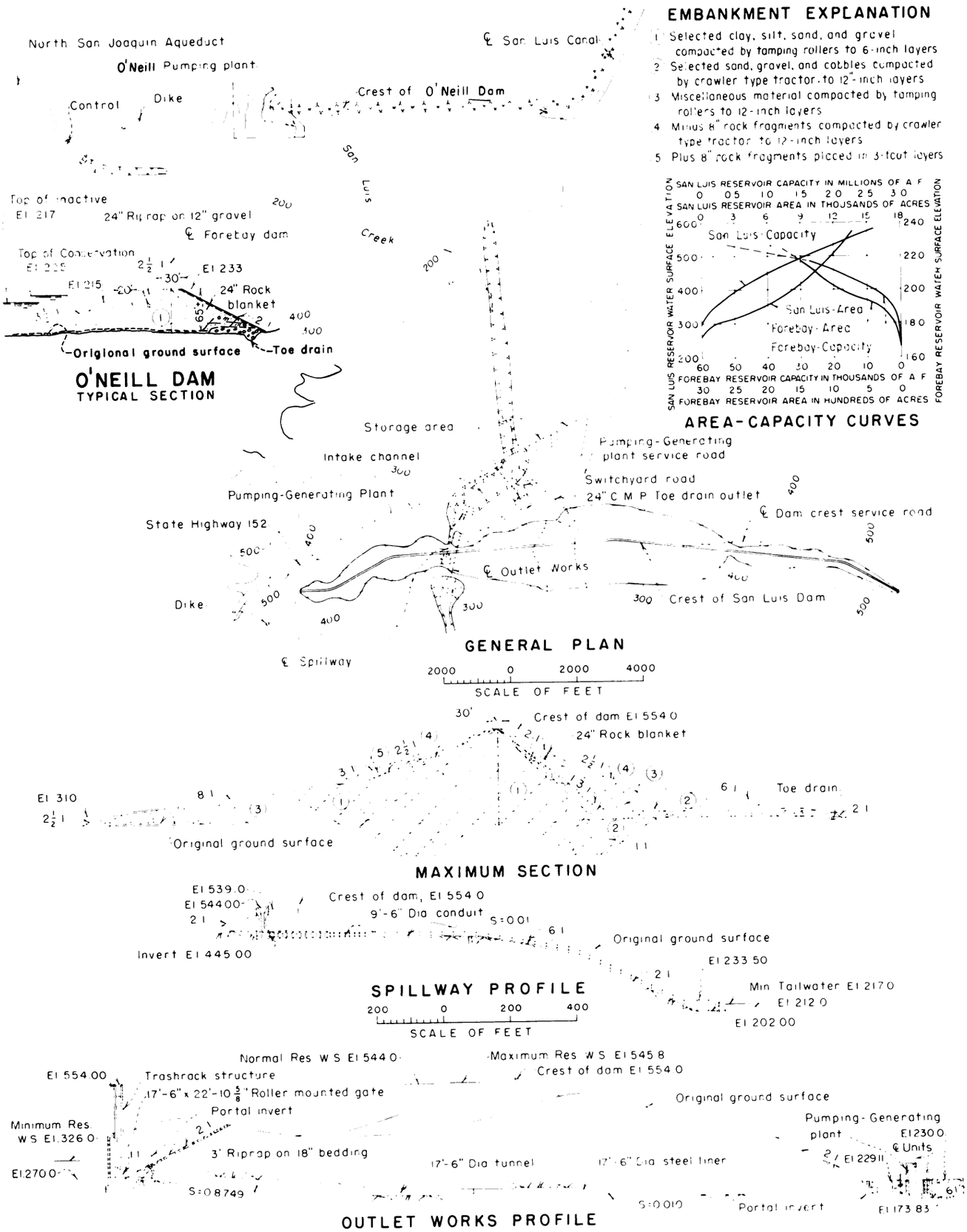
Power Facilities

San Luis Pumping-Generating Plant

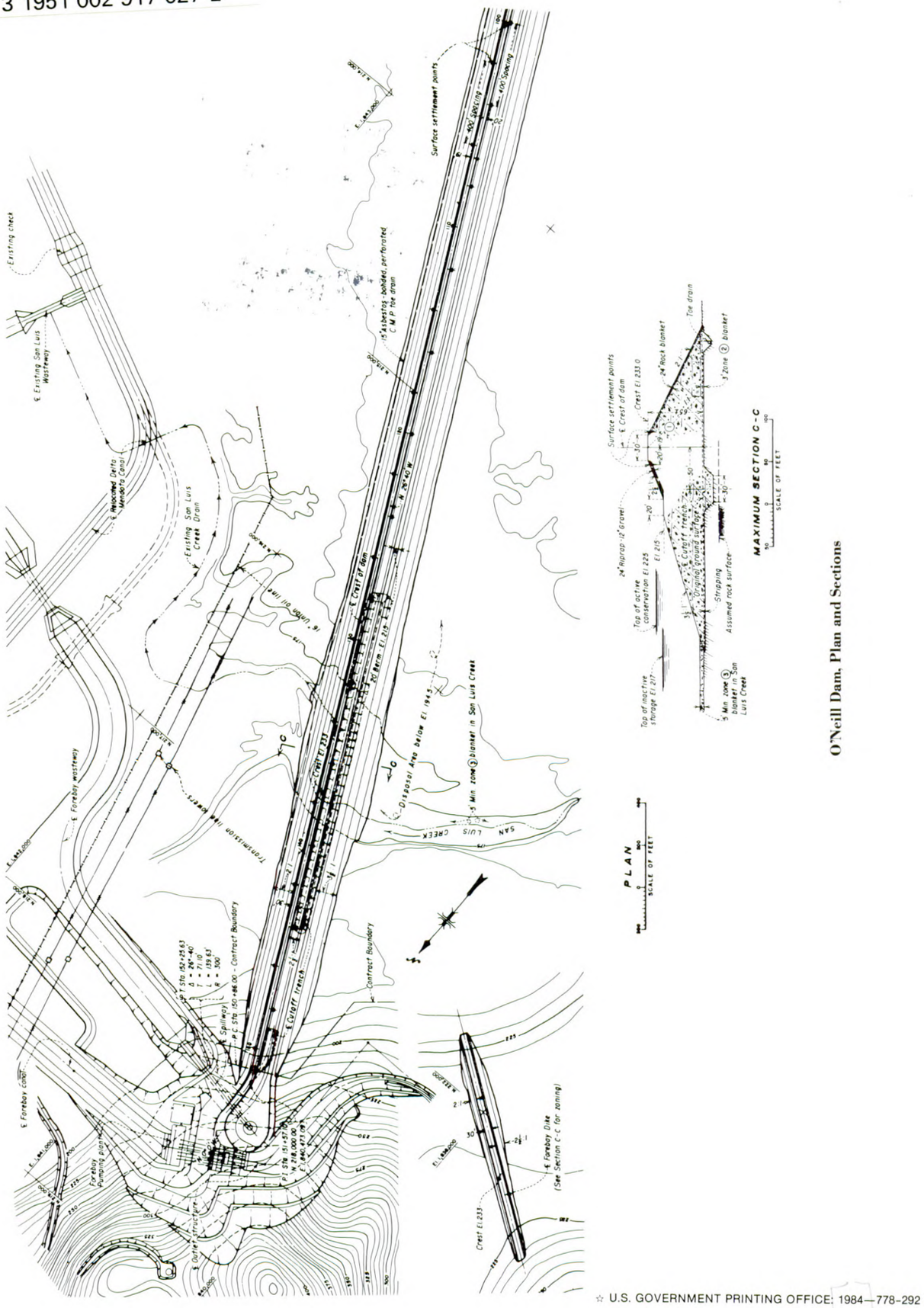
Location: At San Luis Dam, 12 mi west of Los Banos, Calif.		
Year of initial operation: 1968		
Year last generator placed in operation: 1968		
Nameplate capacity	424,000	kW
Number and capacity of generators	(8) 53,000	kW
Maximum head	323	ft

O'Neill Pumping-Generating Plant

Location: At O'Neill Forebay Dam, 12 mi west of Los Banos, Calif.		
Year of initial operation: 1967		
Year last generator placed in operation: 1968		
Nameplate capacity	25,200	kW
Number and capacity of generators	(6) 4,200	kW
Maximum head	56	ft



San Luis Dam, Plan and Sections



O'Neill Dam, Plan and Sections

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