II - DESCRIPTION OF PROJECT

2-01. Location

Sepulveda Dam is located across the Los Angeles River, 43 miles above the mouth of the river, and 6 miles above the confluence of Tujunga Wash and the Los Angeles River. The dam is in the south-central portion of the San Fernando Valley, just northwest of the junction of the Ventura Freeway (U.S. Highway 101) and the San Diego Freeway (Interstate Highway 405). (See pls. 2-01 through 2-04).

Sepulveda Dam, which lies within the City of Los Angles, is about 2 miles southwest of the City of Van Nuys Civic Center, 9 miles west of the City of Burbank, and about 15 miles northwest of the Civic Center of Los Angels. The geographical coordinates of the outlet works of the dam are 34E09'48"N latitude, 118E27'59"W longitude.

2-02. Purpose

The primary purpose for which Sepulveda Dam was constructed is flood control. Other uses and benefits of the dam and reservoir such as recreation, agriculture, and wildlife mitigation are secondary. Sepulveda Dam regulates flows on the Los Angeles Rive, and is designed to prevent flooding along the river below the dam.

Sepulveda Dam forms part of the system of flood control structures located on the San Gabriel and the Los Angeles Rivers and their tributaries, which are collectively known as the Los Angeles County Drainage Area (LACDA) (see pl. 2-02 and Exhibit C).

2-03. Physical Components

Sepulveda Dam a consists of an earthfilled embankment with a reinforced concrete spillway and outlet works. The components of Sepulveda Dam and Reservoir include:

a. Dam. The dam is an unzoned, impervious, rolled-earth embankment with a crest length, including outlet works and spillway, of 15,444 feet (2.93 miles) at top of dam, elevation 725 feet, NGVD, and a crest width of 30 feet (pl. 2-05). The maximum height above the original Los Angeles River streambed is 57 feet. The upstream slope is 1:3, and the downstream slope is 1:4. The upstream slope is protected by grouted stone paving.

One flank of the dam’s embankment extends southwestward from the outlet works, then westward alongside the Ventura Freeway (merging with the freeway embankment for approximately 0.6 miles) (pl. 2-07). The other flank extends northeastward, then northward, along the Aan Diego Freeway (merging with the freeway embankment for approximately 1.1 miles).

b. Outlet Works. The outlet works are located at the southwest end of the spillway section and aligned to discharge into the downstream Los Angeles River (pls. 2-08 through 2-12).

(1). <u>Approach Cannel</u>. Inflow to the outlet works (when water is not stored behind the dam) is from the northwest via the approach channel of the Los Angeles River (pls. 2-05 and 2-08).

(2) <u>Outlets</u>. The outlets of the dam are installed in a concrete section, 83 feet in width. Outflow is discharged through four gated outlets, 6 feet wide y 9 feet high, and four ungated outlets, 6 feet wide by 6,5 feet high–all with entrance invert (sometimes referred to as gated sill) at elevation 668 feet.

The four gated outlets are in the center of the outlet works, with tow ungated outlets on each side (pls. 2-08 through 2-12). The hydraulically operated, vertical lift type gates open and close about one foot per minute and may be locked in any position.

The outlet works are equipped with trash racks on the upstream side to prevent debris from obstructing the outlets or washing downstream (pl.2-10).

Plate 2-13 shows discharge rating curves for each of the four gated and four ungated outlets at Sepulveda Dam, plus curves for all gated and/or ungated outlets combined. The discharge (in thousands of cubic feet per second) is plotted against reservoir water surface elevation (in feet, NGVD), assuming in each case fully opened gates. A tabulation of total discharge through all eight gates (fully open) is given in Exhibit E.

(3) <u>Outlet Channel</u>. Downstream of the conduit outlet portals, piers 13 feet in length provide a smooth transition to the flow from the eight conduits to the downstream channel (see pls. 2-08 through 2-12). Below the piers, the outflow discharges into a rectangular concrete channel, which is 83 feet side for a distance of 294 feet, then tapers, over a 400-foot transition, to a width of 50 feet (pls. 2-08 through 2-12).

The channel invert, from the portal piers through the transition taper, is designed on a slope of 0.00924, which is sufficient to prevent backwater on the conduits and to insure smooth flow through the transition for discharges up to at least 15,300 cubic feet per second (cfs).

The combined maximum capacity of the outlets is 16,500 cfs at a reservoir water surface elevation of 710 feet–the height of the spillway crest with spillway gates raised (see Section2-03.d.(2)).

Downstream of Sepulveda Dam, the channel capacity of Los Angeles River increases progressively (pl. 2-04).

c. <u>Control House</u>. A control house, located on top of the dam and entered over the outlet conduits (pls. 2-08 through 2-12), contains a switchboard, standby power units, service hoist, and communication and hydrologic equipment. Commercial power is supplied for lighting, with standby power available.

d. Spillway. The spillway is a reinforced concrete ogee section of the overflow gravity type, having a gross length of 469 feet and a crest elevation of 700 feet, NGVD (pls. 2-08 through 2-12). The spillway has seven submersible drum gates, each 57 feet long. The description of a drum gate is give in EM 1110-2-3600 (4-2.b.(3)) and is quoted below.

A drum gate is designed to float on water in a chamber located in the spillway crest. The water which is being spilled flows over the top of the drum onto the ogee section of the spillway. The drum is raised by hydrostatic pressure and its range of operation is from its lower limit where the top of the drum is at the spillway crest elevation (fully open) to its upper limit where the top of the drum corresponds to full pool level (fully closed).

The drum gates are separated by six 10-foot-wide piers, with a 5-foot-wide pier abutting each end of the spillway (pl. 2-09). The total net spillway width over which can pass is thus 399 feet.

(1) Spillway Approach. The approach to the spillway (pls. 2-08 and 2-09; photograph 2-20) is a very gently sloping unpaved earthen ramp, rising from the river’s approach channel to an elevation of 680 feet (pl.2-10).

(2) Crest Gates. Sepulveda Dam was designed with operable crest gates instead of with a fixed spillway. This was done in order to minimize the water surface elevation of a spillway design flood, and hence minimize the height of the op of the dam–-thus saving on both construction costs and the amount of land that would have to be acquired for the reservoir. With a fixed spillway elevation, flow over the spillway crest would increase rather gradually as the water would rise above the reservoir design flood elevation (and spillway crest elevation) of 710 feet. With moveable spillway crest gates, on the other hand, the lowering of these gates would allow for a much greater discharge from the reservoir at heights not greatly in excess of the spillway crest.

The seven crest gates, each submersible drum gates, are constructed of structural steel, with each complete gate assembly weighing about 100,000 pounds. These gates are designed to rise of the ogee section in unison to a maximum elevation of 710 feet– the elevation above which an uncontrolled spill occurs (pls. 2-08 and 2-10). The gates are set for fully automatic operations, but can also be operated in semi-automatic or emergency manual modes, as described below.

(a) Fully Automatic Operation. The crest gates are designed to operate automatically as the reservoir water surface elevation rises above 692.5 feet. This operation, which is essential to prevent overtopping and failure of the embankment of the dam by a probably maximum flood, is depicted on plates 2-14 and 2-15, and is explained in the subparagraphs below.

1. Crest Gate Operation as Function of Water Surface Elevation.

a. Water Surface Elevation Below 692.5 feet. At all reservoir surface elevations below approximately 692.5 feet, the crest gates are in their lowest position, with spillway crest elevation of 700 feet.

Below each crest gate is a gate pit. When the reservoir water surface elevation reaches elevation 686 feet (the bottom of the gate pit inlet–pls. 2-09 through 2-12), water begins to flow through the inlet into the gate pit (pls. 2-14, diagram I).

The water surface elevation inside the gate pit rises with that of the reservoir, but lags behind the reservoir water surface elevation by perhaps a foot or more if the reservoir is rising rapidly (pl.2-14).

b. Water Surface Elevation 692.5-699 feet. When the gate pit water surface elevation reaches 692.5 feet, the corresponding crest gate begins to float. The gate then rises ahead of the reservoir surface, maintaining an increasing freeboard above the reservoir (pl. 2-15), but with the maximum rate of rise of each crest gated limited to approximately 6 feet per hour. When the water surface inside each gate pit has reached approximately 699 feet, the corresponding crest gate has reached its maximum elevation of 710 feet.

During the floods of 16 February 1980 (when the reservoir water surface elevation reached its all-time historical maximum of 705.10 feet) and 1 March 1983 (maximum reservoir surface 702.53 feet), all crest gates had risen to their maximum height of 710 feet.

If the reservoir water surface elevation were to peak below 699 feet, the water in each gate pit will begin to flow out through the inlet, back into the reservoir, and the crest gate will be gin to lower.

During the storm and reservoir impoundment of 20-24 February 1944, the automatic operation of each crest each gate was recorded, and the results are diagramed on plates 2-16 and 2-17. Plate 2-16 depicts the rise and fall with time of both the reservoir water surface and each of the seven crest gates on 22 February 1944. Plate 2-17 plots the crest gate elevation against the reservoir water surface elevation. The lag of each crest gate behind the rise or fall of the reservoir can be seen on plate 2-17.

c. Water Surface Elevation 699-712 feet. As can be seen on plate 2-15, the top of each crest gate is maintained at maximum elevation of 710 feet for reservoir surface elevations between approximately 699 feet and 712 feet. The latter number is the current setting of an adjustable elevation at which the crest gates begin to automatically lower.

The diagrams of Plate 2-14 show a cable stretching from the crest gate around an idler wheel and a pair of pulleys to a float housed within a float well located within the reservoir. At a water surface elevation of about 710 feet (diagram II), the idler wheel has been lifted to near the top of its slot by upward forces exerted by both the float and the floating crest gate.

d. Water Surface Elevation 712-715 feet. When the reservoir water surface elevation (and hence the water surface inside each float well) reaches 712 feet (according to the current setting), the idler wheel rises sufficiently to hoist the lift valve, opening the outflow conduit, and allowing water to escape from the gate pit (pl. 2-14, diagram III). Since the outflow conduit is larger than the inflow conduit, the water surface in the gate it lowers, and the floating crest gate also begins to fall until the lift valve reaches a level at which the inflow to, and outflow from the gate pit are balanced. The rate of spill over the top of the lowering crest gates is now increasing rapidly.

The lowering of the crest gates as a function of the rising reservoir surface (between 712 and 715 feet--the current settings) can be seen on Plate 2-15. The mechanical cause of the automatic lowering of each crest gate is the continued rise of the float inside the float well.

The leverage that is exerted by the rising float (pl. 2-14) is determined by settings of the Crest Gate Control Mechanism. These are described on plate 2-18. According to the current settings, a float-rise of 3 feet (from 712 to 175) will lower the top of the crest gate all the way down from its maximum elevation of 710 to its lowest position of 700 feet (pl. 2-12).

It should be noted that the physical top of the crest gate is its exposed end point when the gate is mostly or totally elevated (pl. 2-14, diagrams II and III). As the gate is lowered, the highest point on the gate travels along the curved upper surface of the gate, progressively closer to the gate hinge (pl. 2-14, diagram I).

The minimum time required for the crest gates to lower all the way from 710 to 100 feet is about 15 minutes.

e. Water Surface Elevation Above 715 feet. For any reservoir water surface elevation 715 feet (according to the current setting), the crest gates will have completely lowered to the ogee crest elevation of 700 feet (pl. 2-15), and water will be spilling over all seven bays of the spillway at depths exceeding 15 feet.

2. Spillway Discharge Rates. Plate 2-19 depicts the rating curve for the discharge through the seven spillway bays as a function of reservoir water surface elevation, given the current fully automatic crest

gate settings. For reservoir surface elevations between 710 and 712 feet, the discharge over the top of the crest gates increases very slowly. At elevations between 712 and 715 feet, however, the rate of discharge increases very rapidly with elevation, as the crest gates lower from 710 to 700 feet.

One characteristic of this type of crest gate is that for reservoir elevations in excess of 712 feet (as the crest gates are currently set), the spill rate increases so rapidly that serious downstream flooding could result in the event of a reservoir surface elevation of 713 or 714 feet. The Standard Project Flood is calculated to produce a maximum reservoir surface elevation of 713.52 feet. This is discussed and illustrated in more detail in Section 8-02.b.

3. Adjustments of Crest Gate Settings. The crest gates, as currently set, begin to lower automatically when the reservoir surface elevation reaches 712 feet. They complete their lowering process when the reservoir surface reaches 715 feet. Theses elevations are individually adjustable within certain limits.

The reservoir surface elevation at which the crest gates begin to lower automatically can be individually set between 710 feet and 715 feet. The reservoir surface at which the gates become fully lowered can be set between 710 feet and 716 feet. The mechanisms by which these adjustments are possible, along with diagrams, discussions, and examples of how such adjustments are made, are depicted on plate 2-18.

(b) Semi-Automatic Crest Gate Operation. It is also possible for the control mechanism of each crest gate to be adjusted so that the gate will float upward ahead of a rising reservoir surface, but will remain at any selected elevation from 700 though 710 feet inclusively, without automatically lowering again as the reservoir surface continues to rise above elevation 710 feet. This semi-automatic operation procedure option is described on plate 2-18, and in more detail in the Operation and Maintenance Manual for Sepulveda Dam, Los Angeles River Improvements, Los Angeles County Drainage Area, California (December 1970).

Implementation of this semi-automatic type of crest gate control requires a minimum of one-half hour for each of the seven crest gates, and requires the physically demanding labor of at least one person (for the opening and closing of nine gate valves by the turning of large heavy valve wheels). If all gates were to be placed from fully automatic operation into semi-automatic operation at the same time (for example, during a major storm and runoff event), a crew of seven trained persons would be required. The same task could perhaps be accomplished with a crew of four, working for at least one hour. (In the opinion of the current Sepulveda Dam Tender, two gates are about the maximum that one person could change at one time without becoming overly fatigued.)

The reverse procedure (from semi-automatic to fully automatic) involves approximately the same time and manpower requirements.

During a major storm event, with streets flooded and with helicopter travel dangerous because of low clouds and strong winds, it may not be practical to transport a crew to Sepulveda Dam in time to implement such semi-automatic operation in order to avoid the automatic lowering of the crest gates. On the other hand, the crest gates must not be left on semi-automatic operation permanently. This would defeat the purpose for which fully automatic crest gate operation is designed and programmed in order to prevent overtopping and failure of the embankment of the dam by a Probable Maximum Flood. (And for the same reasons as transport a crew to the dam in time to change the crest gate operation from semi-automatic to fully automatic in anticipation of a near Probable Maximum Flood.)

(C) Manual Crest Gate Operation. The crest gates can also be operated manually during periods of low or zero water storage behind Sepulveda Dam, as is illustrated on plate 2-18.

1. Testing, Using City Water. In this test operation, which is normally performed once each year, city water is piped into the gate pit to of each crest gate, and the gate is floated to its maximum elevation of 710 feet. The water is then released, and the gate lowers to its minimum elevation of 700 feet. The entire test operation of all seven crest gates takes several hours and requires many thousands of gallons of city water.

The automatic lowering of the spillway gates cannot, however, be tested by the use of city water. There is no easy way t sustain high water in the float well. Furthermore, no historical flood has ever approached the threshold of automatic lowering (currently set at 712 feet), so no natural test of this feature has ever occurred.

2. Emergency Manual Operation. If the control mechanism of any crest gate should become inoperative, there is an emergency procedure by which a crest gate can be manually raised or lowered. Implementation of this procedure requires at least one-half hour, and requires the services of one able-bodied crew member for each gate.

(3) Spillway Apron. Water Spilling over the raised crest gates would cascade down across the ogee onto the spillway apron. This apron is a large concrete slab with a gentle downward slope, extending 694 feet downstream of the ogee (see pls. 2-05 through 2-09).

e. Reservoir Lands. The boundaries of this normally dry reservoir are defined according to the real estate acquired by the Federal Government for the purpose of flood control behind Sepulveda Dam. These boundaries (shown on pl. 2-07) encompass a total of 2,097 acres and extend essentially from the San Diego Freeway (I-405) on the east and the Ventura Freeway (U.S.-101) on the south to Victory Boulevard on the north and to about 0.2 miles beyond Balboa Boulevard on the west, with a strip of flood control land about 0.4 mile wide extending westward on either side of the Los Angeles River to White Oak Avenue.

Table 2-01 lists the volume of, and area covered by, impounded water in Sepulveda Reservoir as a function of water surface elevation. Plate 2-20 graphically depicts these relationships. Exhibit D is a detailed table of the reservoir water surface elevation vs. capacity (storage) for Sepulveda Dam.

The inundation caused by the impoundment of water to specific elevations behind Sepulveda Dam are shown in table 2-02.

f. Los Angeles River Channel. The channel of the Los Angeles River, along most of its length below Sepulveda Dam, and for about 7 miles upstream of Sepulveda Dam, is of concrete construction on the sides and bottom, either rectangular or trapezoidal, with a shallow rectangular low-flow channel in the center. The channel capacities and configurations of the Los Angeles River between Sepulveda Dam and the Pacific Ocean are depicted on plate 2-04.

2-04. Related Control Facilities

The flows of the Los Angeles River, upstream to the confluence with Tujunga Wash, is regulated exclusively by Sepulveda Dam. Below Tujunga Wash, the Los Angeles River is regulated jointly by Sepulveda, Pacoima, Lopez, and Hansen Dams. Still farther downstream, other dams, including Devil's gate and Whittier Narrows, are added to the list (see Section 4-11).

2-05 Real Estate Acquisition

The boundaries of real estate that the U.S. Army Corps of Engineers acquired for Sepulveda Reservoir are depicted on plate 2-07. The original cost of this 2,097-acre acquisition, which took place between 1939 and 1942, was $1,497,595.

2-06. Public Facilities

Plate 2-07 is a map of Sepulveda Reservoir, depicting the various recreational and other facilities that comprise the Sepulveda Basin Master Plan.

A summary and discussion of existing and proposed facilities within Sepulveda Reservoir is contained in the U.S. Army Corps of Engineers Final Report of Sepulveda Basin Master Plan, Final Environmental Impact Report/Environmental Impact Statement (March 1981) and the Sepulveda Basin Recreation Lake; Feature Design Memorandum (March 1987). Table 2-03 lists these facilities.

In accordance with guidance outline in EC 113–2-121, the Corp s of Engineers participates with the City of Los Angeles in a cost-sharing program for recreational development, known as the Code 710 Program. The Sepulveda Basin Master Plan, Final Environmental Impact Report/Environmental Impact Statement, approved in March 1981, provides the basis for future development within the basin.

a. Recreation Facilities. Bull Creek Park, located in the central area of Sepulveda Flood Control Basin, is to be composed of a 26-acre recreation lake and adjacent facilities and 134 acres of park lands. The park will provide multiple recreational opportunities including bicycling, jogging, hiking, non-motorized boating, informal play activities, and picnicking.

The recreation lake facility is currently under construction. The volume of the lake will be approximately 180 ac-ft at a maximum water surface elevation of 704.5 feet. The entire lake will be formed by excavation. Materials excavated from the lake are deposited along the northern perimeter of the site above the Probable Maximum Flood (PMF) elevation of 716.66 feet resulting in no net impact to the Sepulveda Basin that inundate the recreation lake facility.

b. Wildlife Management Facilities. A wildlife area is located in the eastern portion of the Sepulveda Basin. North of Burbank Boulevard, near the intersection of Woodley Avenue, a wildlife management section is currently under expansion; upon completion of the current phase the management section will include a 15-acre riparian area, an 8-acre Oak-woodland area, a 26-acre native grassland and coastal sage scrub area, and an 11-acre wildlife pond. At a maximum water surface elevation of 684 feet, the approximate volume of the pond will be 43 ac-ft. The volume will be completely compensated for by excavating material upstream and adjacent to the dam spillway structure below the spillway crest elevation (700 feet, NGVD), and removing the material from the basin. An overflow spillway will keep the maximum elevation of the pond at 684 feet by passing excess water to the Los Angeles River Channel. South of the intersection of Burbank Boulevard and Woodley Avenue is a designated wildlife area though no current or future plan exists for enforcement of wildlife management policies. Again, no net impact to flood control capacity of Sepulveda Dam has occurred as a result of wildlife mitigation activity.

c. Arts Park Facility. In the north-central corner of Sepulveda Basin, closest to urban areas with high intensity use and adjacent to the recreation lake, an Arts Park has been designated. The park will be limited to tents and other temporary structures that would be erected seasonally. The Arts Park poses not threat to Sepulveda basin’s primary objectives of flood control.

It can be anticipated that, in time, public facilities within the Sepulveda Flood Control Basin will be inundated at various elevations. It is for this reason that all projects within the basin must comply with hydraulic criteria as developed by the U.S. Army Corps of Engineers (Sepulveda Basin Recreation Lake: Feature Design Memorandum (March 1987)).

Subsequent phases of future project development intended for enhancement of public recreation and wildlife preservation must also not impact flood control objectives. Flood management needs are the primary purpose of Sepulveda Basin, with all future development adhering to these needs and requirements.

d. Wastewater Treatment Facilities. Located in the northeast corner of the Sepulveda Flood Control Basin is the Donald C. Tillman Water Reclamation Plan (TWRP). TWRP is owned and operated by the City of Los Angeles, Department of Public Works on land leased by the department from the U.S. Army Corps of Engineers since 1969. The plant was place on-line in September 1985 and currently provides advanced secondary treatment for an average influent of 40 million gallons per day. Phase II expansion of TWRP is expected to be completed in 1991, increasing the capacity of the plant to 80 million gallons per day.

As a result of continuing urbanization in the San Fernando Valley (causing an increase in the expected inflow), the TWRP is located within the expected 100-year frequency flood water surface elevation (see pl. 2-07), increasing the chances of inundation of the plant. Because TWRP was constructed with Federal assistance, the National Flood Insurance Act Amendments of 1973 required that it be protected from the 100-year frequency flood event (see table 1-01; Environmental assessment, Water Control Plan, Sepulveda Flood Control Basin, (may 1987)). The Environmental Protection Agency (EPA) has thus requested the City of Los Angeles to provide a floodwall and/or floodproofing for the plant. The design is currently under evaluation, however, the design alternative chosen will no result in any net negative impact to the flood control capability of the Sepulveda Flood Control Reservoir. As stated in previous sections of this report, operation of the reservoir is committed to flood control objectives regardless of any deleterious effects that may occur to facilities within the basin. In the event the TWRP becomes inundated during flood control operations, the plant would be shut down and all sewage would be diverted via a sewer line connected with the Los Angeles Hyperion Treatment Plant.

Any future development associated with the TWRP will be subject to the same conditions stated above, to preserve the flood control capability of the Sepulveda Food Control Reservoir.

Table 2-01. Relationships of Water Surface Elevation to Capacity (Storage) and Area, Sepulveda Dam, Los Angeles County Drainage Area, California.

Water Surface Elev.* (ft., NGVD)	Volume (ac-ft)	% of Capacity to Spillway Crest (Crest Gates Raised)	Area (acres)	Maximum Depth (ft)
668.0	0.0	0.00	0.00	0
669.0	0.3	0.00	0.45	1
670.0	0.9	0.01	0.90	2
671.0	2.1	0.01	1.50	3
672.0	3.9	0.02	2.30	4
673.0	6.7	0.04	3.55	5
674.0	11.0	0.06	5.65	6
675.0	18.0	0.10	9.15	7
676.0	29.3	0.17	13.50	8
677.0	45.0	0.26	18.15	9
678.0	65.6	0.38	24.10	10
679.0	93.2	0.53	32.35	11
680.0	130.3	0.75	42.55	12
681.0	178.3	1.02	54.15	13
682.0	238.6	1.37	68.25	14
683.0	314.8	1.81	86.00	15
684.0	410.6	2.36	109.70	16
685.0	534.2	3.07	141.80	17
686.0	694.2	3.98	176.60	18
687.0	887.4	5.09	208.35	19
688.0	1,110.9	6.38	239.90	20
689.0	1,367.2	7.85	274.00	21
690.0	1,658.9	9.52	310.75	22
691.0	1,988.7	11.41	350.30	23
692.0	2,359.5	13.54	390.15	24
693.0	2,769.0	15.89	427.80	25
694.0	3,215.1	18.45	466.20	26
695.0	3,701.4	21.24	508.35	27
696.0	4,231.8	24.29	553.90	28
697.0	4,809.2	27.60	602.35	29
698.0	5,436.5	31.20	654.25	30
699.0	6,117.7	35.11	710.25	31
700.0	6,857.0	39.35	765.20	32
701.0	7,648.1	43.89	814.00	33
702.0	8,485.1	48.69	865.00	34
703.0	9,378.1	53.82	926.20	35
704.0	10,337.5	59.33	1,007.95	36
705.0	11,364.0	65.22	1,060.25	37
706.0	12,458.0	71.49	1,126.00	38
707.0	13,616.0	78.14	1,187.00	39

Table 2-01. (Continued)

Water Surface Elev.* (ft., NGVD)	Volume (ac-ft)	% of Capacity to Spillway Crest (Crest Gates Raised)	Area (acres)	Maximum Depth (ft)
708.0	14,832.0	85.12	1,243.50	40
709.0	16,103.0	92.41	1,296.50	41
710.0	17,425.0	100.00	1,335.25	42
711.0	18,799.0	107.88	1,403.00	43
712.0	20,225.0	116.07	1,453.00	44
713.0	21,704.0	124.56	1,504.00	45
714.0	23,232.0	133.33	1,555.00	46
715.0	24,813.0	142.41	1,609.00	47
716.0	26,450.0	151.81	1,667.00	48
717.0	28,147.0	161.53	1,731.00	49
718.0	29,912.0	171.66	1,800.00	50
719.0	31,747.0	182.21	1,873.00	51
720.0	33,637.0	193.15	1,954.00	52
721.0	35,654.0	204.61	2,046.00	53
722.0	37,749.0	216.64	2,150.00	54
723.0	39,954.0	229.31	2,226.00	55
724.0	42,280.0	242.60	2,387.00	56
725.0	44,727.0	256.68	2,447.00	57

*Outlet invert elevation is 668 ft., NGVD.

Table 2-02. Inundation Caused By the Impoundment of Water to Specific Elevations Behind Sepulveda Dam.

Reservoir Level	Max. Elevation (ft., NGVD)	Volume (acre-feet)	Area (acres)
At Revised Spillway Design Flood	716.66	27,563	1,710
At Standard Project Flood	713.52	22,493	1,529
At Top of Spillway Gates (raised position)	710.00	17,425	1,335
At 50-Year Flood	706.50	13,037	1,156
At Historical Maximum	705.10	11,503	1,067
At 25-Year Flood	703.00	9,378	926

Table 2-03. Recreation, Wildlife, and Other Facilities in Sepulveda Reservoir (with reference elevations).

	Name of Facility or Reference	Area (acres)	Range of Elevations (ft., NGVD)
1.	Invert Outlet Works (Sill)		668.0
2.	Recreational Lake (and adjacent lake facilities)	26	676.7 - 704.5
3.	Wildlife Management Area (north of Burbank Boulevard)	60	678.5 - 690.8
4.	Wildlife Management Area (south of Burbank Boulevard)	48	680.2 - 690.8
5.	Sepulveda Golf Course	300	682.8 - 714.2
6.	Hjelte Park - Phase I: Athletic Fields	25	687.2 - 697.0
7.	Burbank Boulevard (lowest elevation at Los Angeles River)		687.2 - 725.2
8.	Agricultural lands	varbl[a]	688.5 - 725.0
9.	Bicycle Trail	11	688.7 - 725.0
10.	Woodley Avenue (lowest elevation at Burbank Blvd; highest elevation at Victory Blvd.)		689.1 - 717.9
11.	Hjelte Park - Phase II: Athletic Fields, Picnic Tables, Trails, Landscaping (CURRENTLY UNDER DEVELOPMENT)	25	690.0 - 707.0
12.	Woodley Golf Course	200	690.6 - 713.0
13.	Model Airplane Center	31	694.6 - 696.5
14.	Woodley Avenue Park	80	698.1 - 711.4
15.	Family Services Community Center	15	698.5 - 701.0
16.	Arts Park (FUTURE FACILITY)	60	699.0 - 720.8
17.	Spillway Crest (crest gates lowered)		700.0

[a]Variable from season to season and year to year.

Table 2-03. (Continued)

	Name of Facility or Reference	Area (acres)	Range of Elevations (ft., NGVD)
18.	Donald C. Tillman Water Reclamation Plant	80	702.6 - 713.0
19.	Balboa Sports Center	80	703.0 - 715.0
20.	Balboa Boulevard (lowest elev. near Los Angeles River; highest elev. at Victory Boulevard)		704.2 - 725.1
21.	Highest Reservoir Surface of Record, 2/16/80		705.1
22.	Hayvenhurst Avenue (lowest elev. at Burbank Blvd.)		705.7 - 716[b]
23.	Headquarters Building, Sepulveda Golf Course: Basement Floor (many golf carts stored)		708.3
24.	Parking Lot for Woodley Golf Course and Bicycle Trail	7	708.7 - 714.8
25.	Hayvenhurst Avenue Field (Encino Little League)	13	708.8 - 718.1
26.	Strawberries and Corn Stand (southwest of corner, Burbank Blvd. and Hayvenhurst Avenue)		709.5
27.	Hayvenhurst Avenue Offramp from Ventura Freeway (U.S. 101) Westbound		709.9 - 725.0
28.	Spillway Crest (crest gates raised)		710.0
29.	Franklin Field (Little League, Velodrome)	33[c]	710.2 - 723.9
30.	Burbank Boulevard and Balboa Boulevard		711.8
31.	Residential private property: front yard, southeast corner, McLellan Ave. and Burbank Blvd. (lowest such elevation upstream of dam)		711.9

[b] Approximate elevation at southern end of reservoir lands.
[c] Area of lease is 28.3 acres.

Table 2-03. (Continued)

Name of Facility or Reference	Area (acres)	Range of Elevations (ft., NGVD)
32. Spillway gates begin to lower		712.0
33. Garden Center	16	712.2 - 719.7
34. 100-Year Flood Water Surface Elevation		712.2
35. Encino Velodrome (part of Franklin Field)		712.4[d] - 723.9
36. Hayvenhurst Avenue Onramp to Ventura Freeway (U.S. 101) Eastbound		713.0 - 727.0
37. Magnolia Avenue (lowest elev. at Hayvenhurst Ave.)		713.1 - 716[e]
38. Valley Region Office and Service Yard	4.5	713.3 - 715.1
39. Standard Project Flood Water Surface Elevation		713.5
40. Residential private property: first floor of dwelling, southeast corner, McLellan Ave. and Burbank Blvd. (lowest such elevation upstream of dam)		713.8
41. Pro Shop (at Sepulveda Golf Course Hdqtrs. Bldg.)		714.0
42. Valley Christian League Fields (Little League)	23	716.4 - 720.0
43. Probable Maximum Flood Water Surface Elevation		716.7
44. Encino Inn Restaurant: floor (part of Sepulveda Golf Course Headquarters Bldg)		716.7

[d] Closed basin below 716.0 feet (not exposed to water from reservoir until reservoir surface exceeds 716.0 feet).
[e] Approximate elevation at Petit Avenue (west end of reservoir lands).

Table 2-03. (Continued)

Name of Facility or Reference	Area (acres)	Range of Elevations (ft., NGVD)
45. Victory Boulevard Fields (Senior Division Little League)	9	717.2 - 718.9
46. Commercial property: first floor, southwest corner, Burbank and Balboa Blvds, AND north side of Victory Blvd. near Woodley Avenue (lowest such elevations upstream of dam)		718.6
47. California National Guard Building, south side of Victory Blvd. near Encino Avenue		720[f]
48. U.S. Navy and Marine Reserve Building, southwest of Victory and Balboa Blvds.		720[f]
49. Air National Guard: Reserve Training and Communication Center Installation		720[f]
50. Railroad Track around Northeast End of Dam		721.7
51. Top of Dam: Design elevation		725.0
Actual range of elevations		723.7 - 725.5[g]
52. Informal Park/Multi-purpose Play (CURRENTLY UNDER CONSTRUCTION)	280	h - h
53. Community Tennis/Gym Center (FUTURE FACILITY)	20	h - h
54. Neighborhood Recreation (FUTURE FACILITY)	10	h - h
55. Sepulveda Fire Station of Magnolia	9	h - h

[f]Approximate elevation.
[g]The decrease in elevation of the northeastern embankment to as low as 723.7 feet reflects settlement that has taken place since the Dam was completed in December 1941 (data obtained from December 1980 topographic survey of the reservoir, and from ongoing Settlement Study, consisting of periodic elevation surveys of the dam, 1941-1985).
[h]Exact range of elevations not yet determined.

Photo No. 2-01. Los Angeles River, with Sepulveda Dam and Reservoir (view from downstream of dam, taken 5/6/75).

Photo No. 2-02. Sepulveda Dam, Reservoir, and Los Angeles River Channel
(view from downstream of dam, taken between 1962 and 1970).

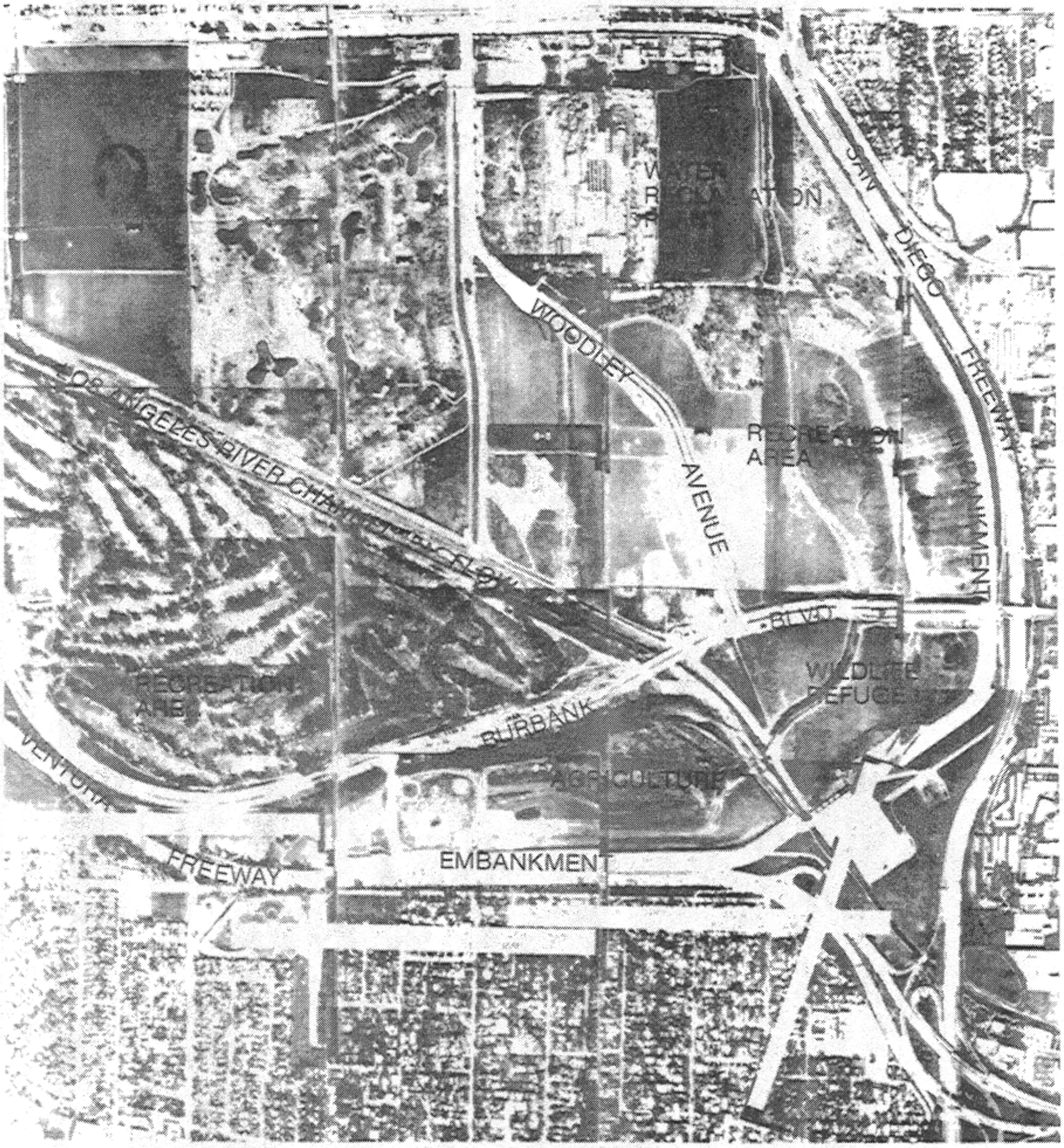

Photo No. 2-03. Sepulveda Flood Control Basin (aerial composite, taken 12/16/82).

Photo No. 2-04. Sepulveda Dam (enlargement of Photo No. 2-03).

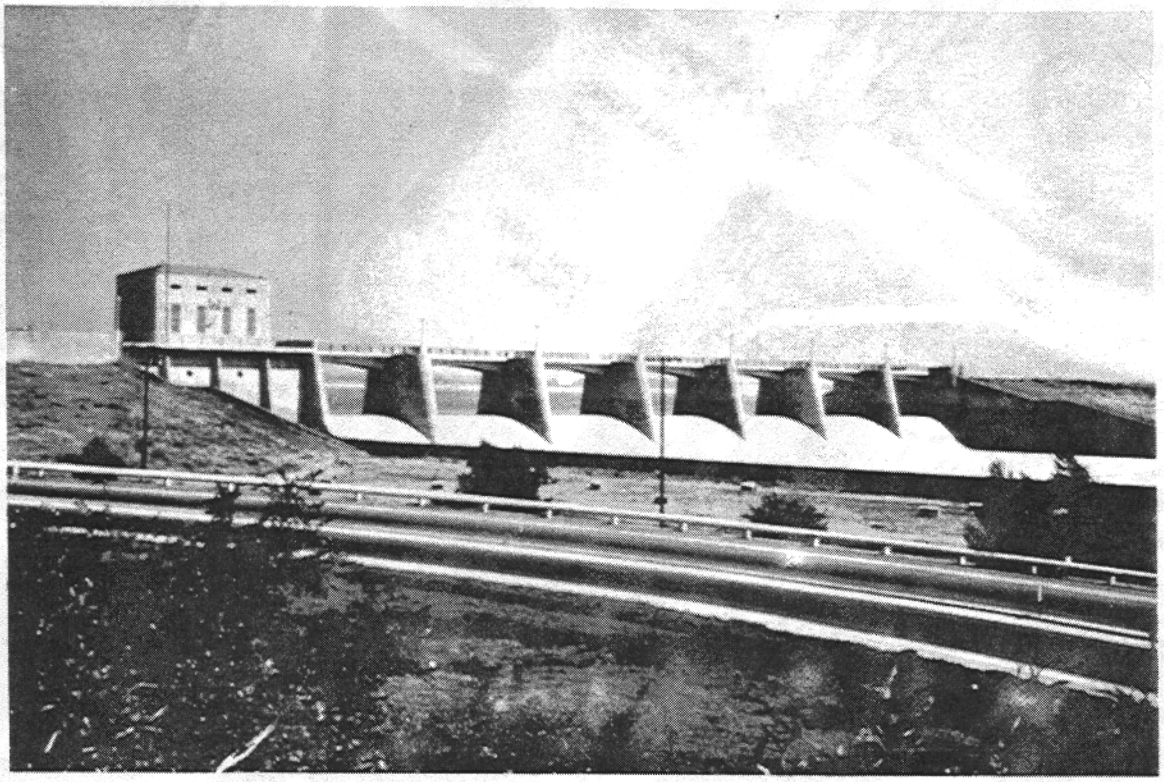

Photo No. 2-05. Sepulveda Dam, with Control House (left) and Spillway (view from downstream, along Ventura Freeway).

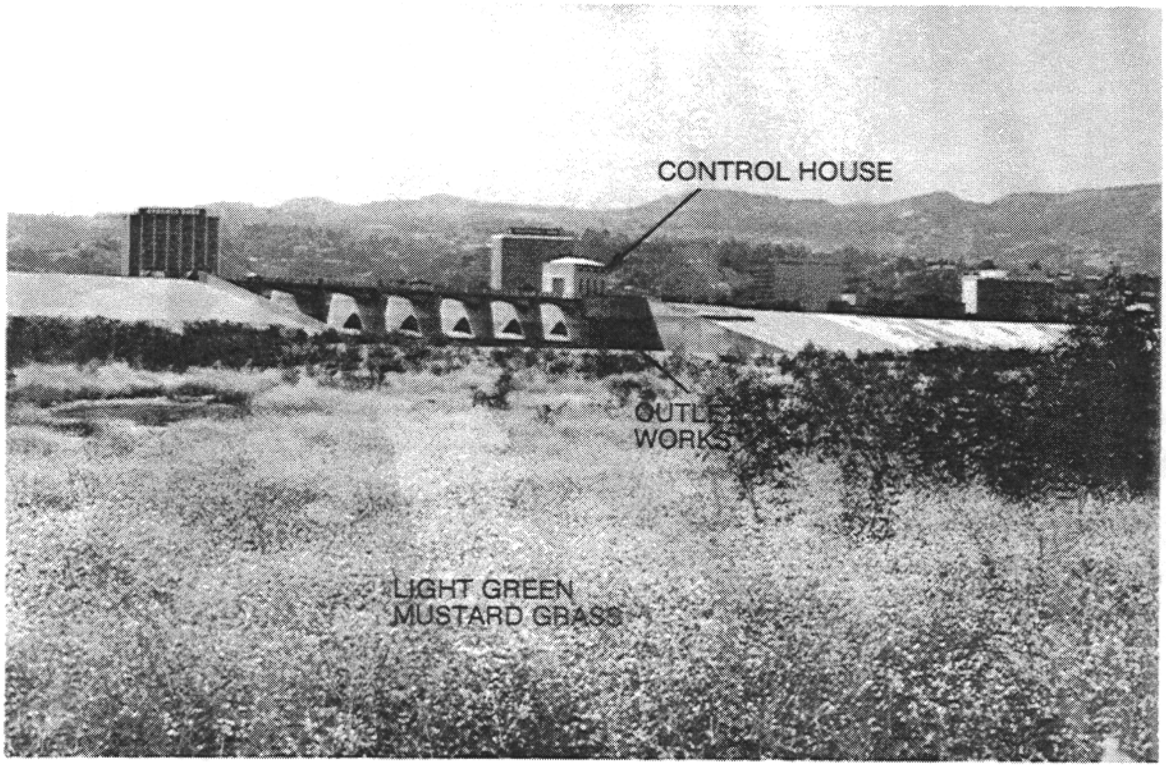

Photo No. 2-06. Sepulveda Dam (view from upstream, within reservoir).

Photo No. 2-07. Upstream Slope of Dam Southwest of Outlet Works (view toward southwest, from outlet works).

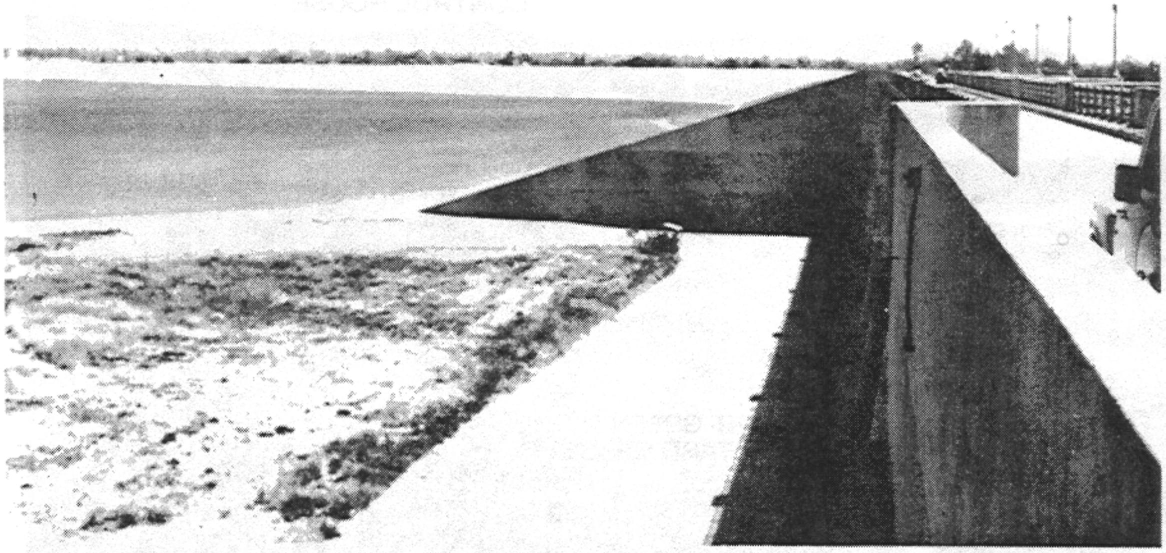

Photo No. 2-08. Upstream Face of Dam Northeast of Spillway (view toward northeast, from spillway bridge).

Photo No. 2-09. Upstream Slope of Dam Northeast of Spillway (view toward south, from east embankment of dam.)

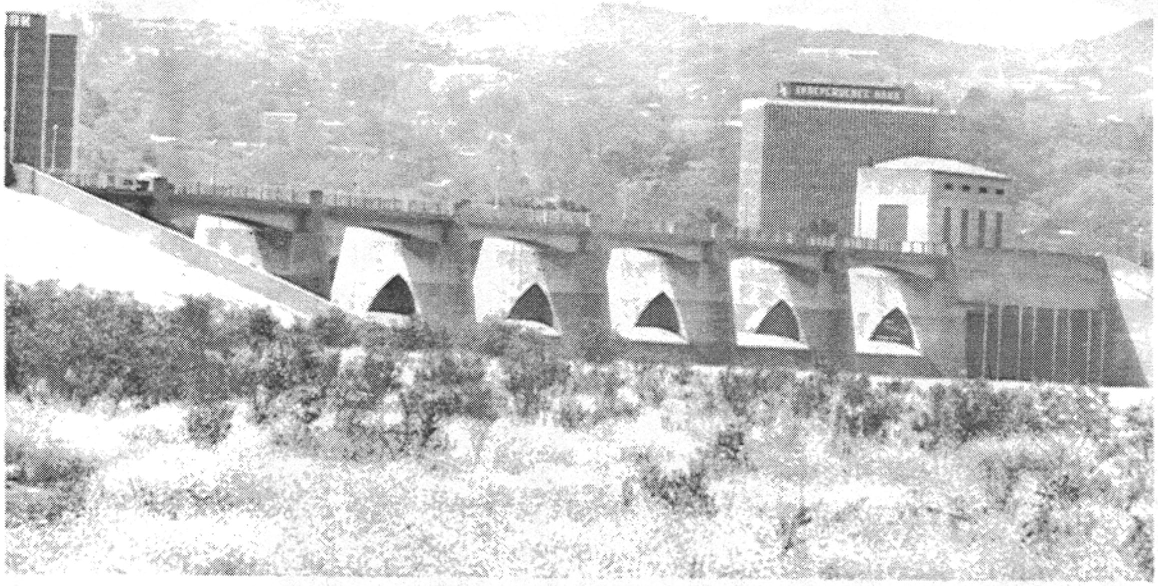

Photo No. 2-10. Control House (right) and Spillway (view from upstream, with reservoir.)

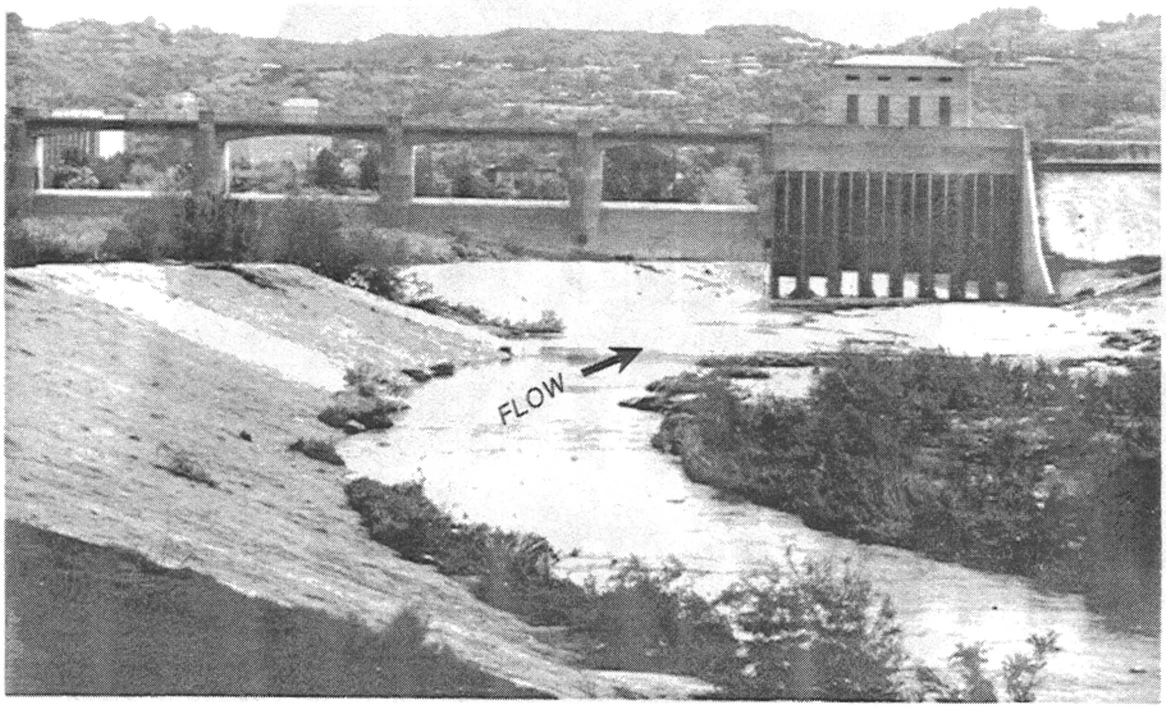

Photo No. 2-11. Control House and Outlet Works, with Spillway to left (view from upstream, within reservoir, along approach channel)

Photo No. 2-12. Los Angeles River: Approach Channel to Outlet Works, with portion of spillway approach to right (view toward upstream from bridge above outlet works).

Photo No. 2-13. Outlet Works (gates fully open), with edge of spillway to left (view from channel upstream).

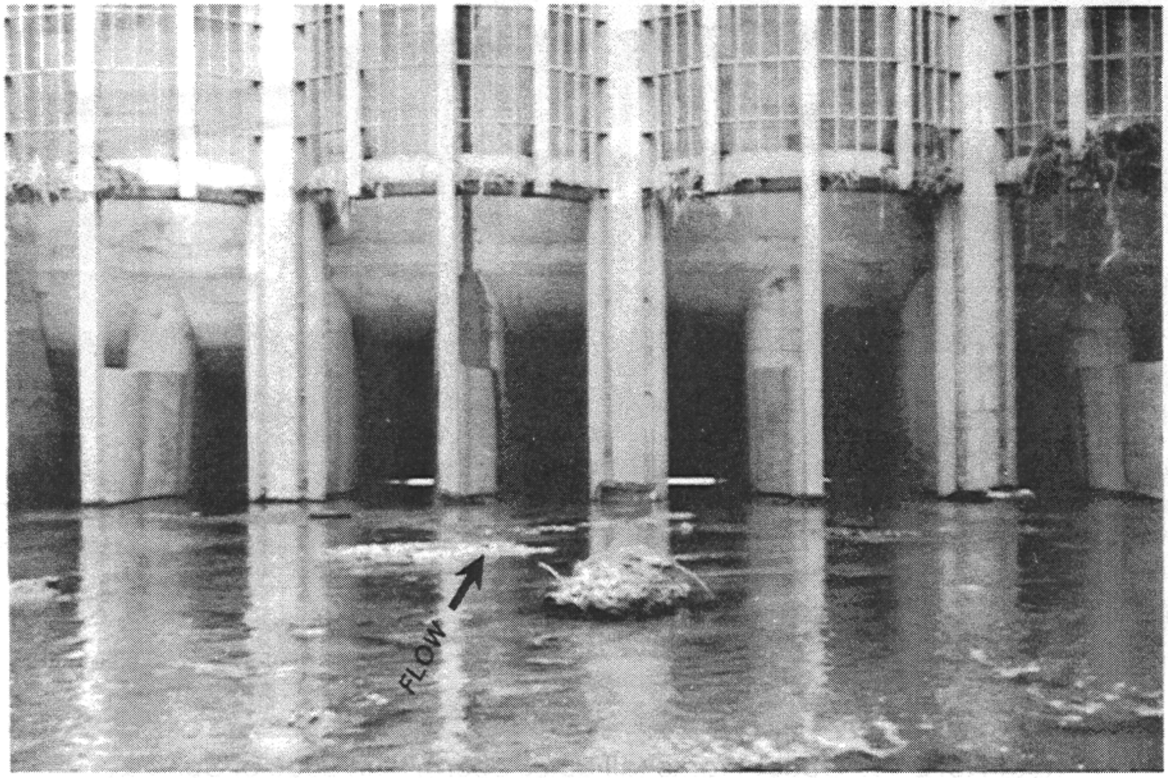

Photo No. 2-14. Approach to Outlet Works (gates partially open) (view from channel upstream).

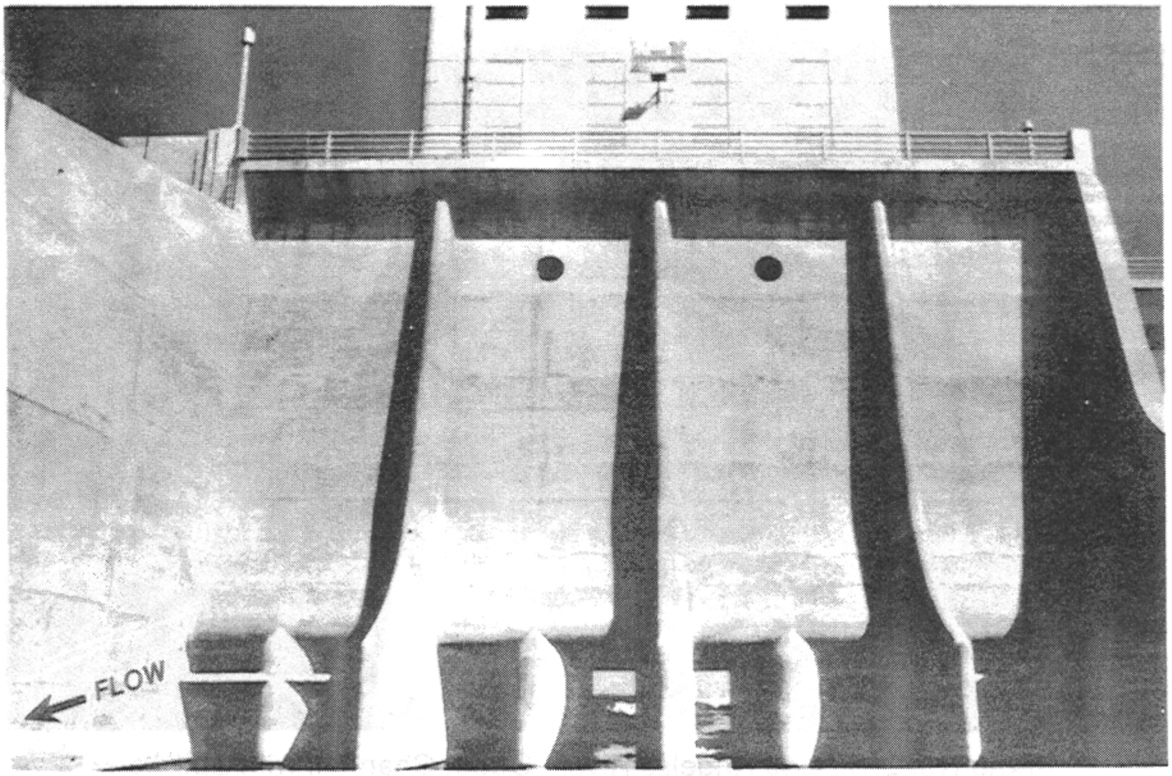

Photo No. 2-15. Outlet Works (center gates fully open) (view from channel downstream).

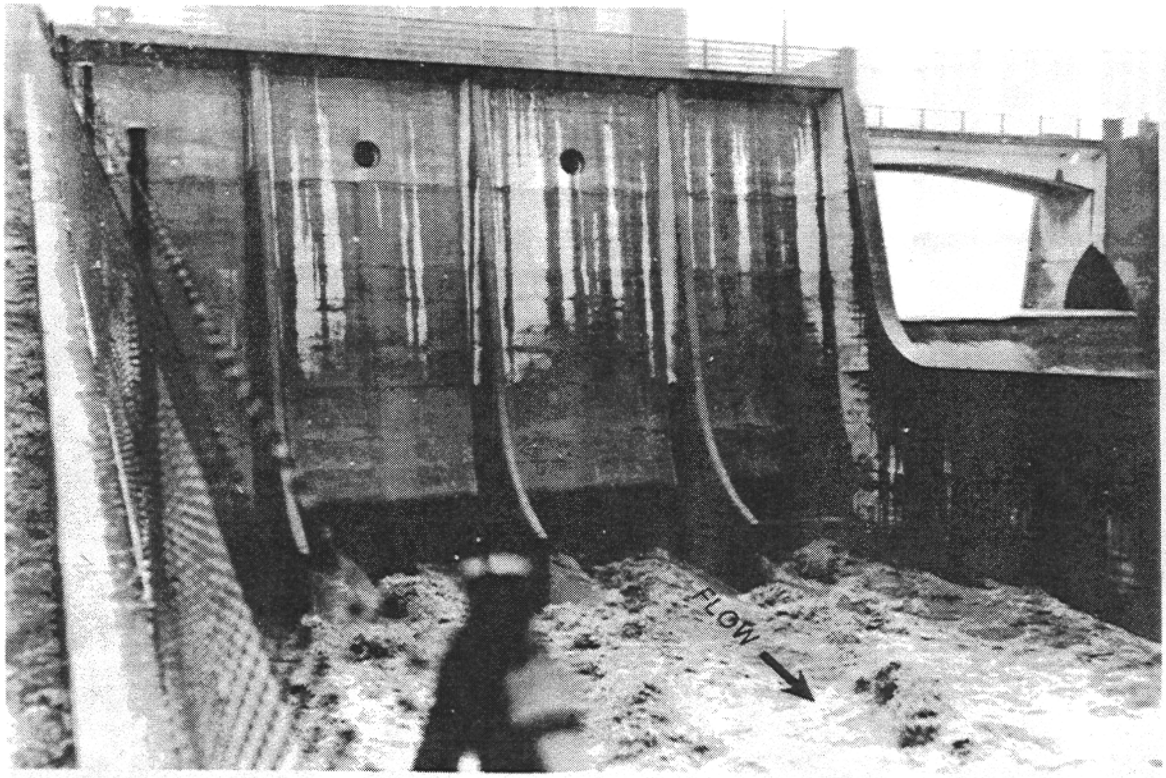

Photo No. 2-16. Outlet Works (all gates open), with edge of Spillway to right (view from alongside channel downstream).

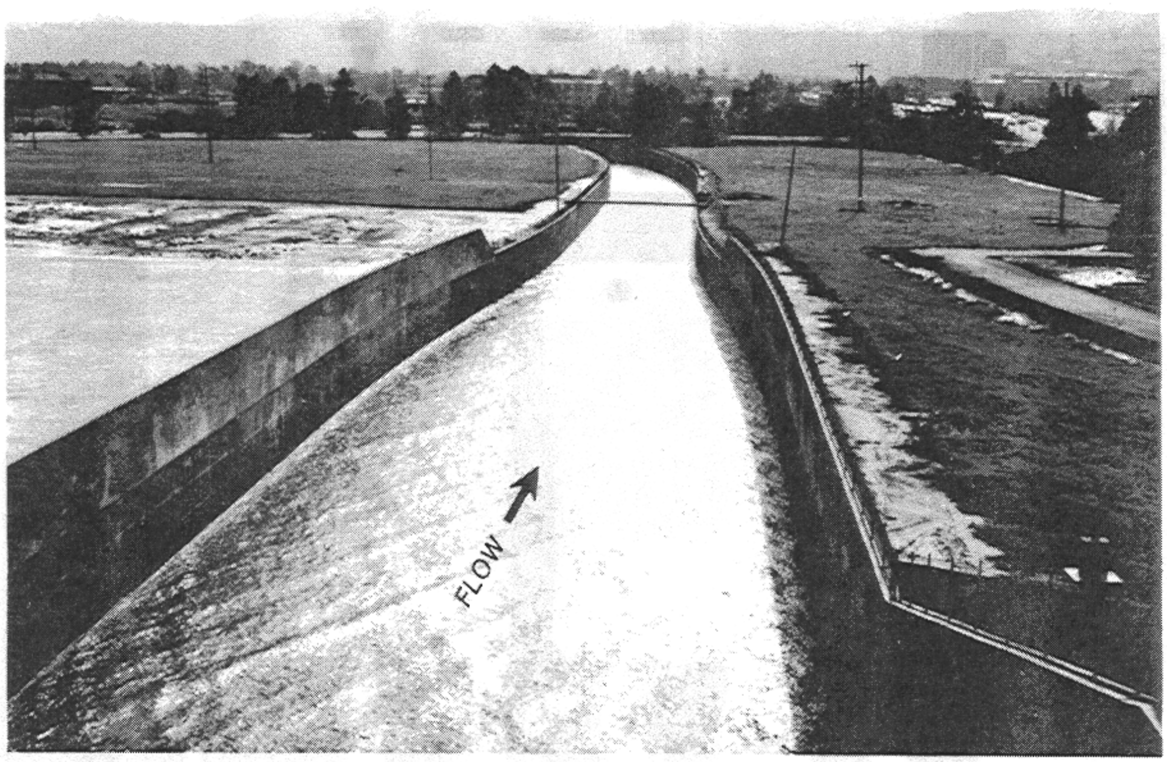

Photo No. 2-17. Los Angeles River: Outlet Channel, with Spillway Apron on left (view toward downstream from bridge above outlet works during high outflows of February 1980).

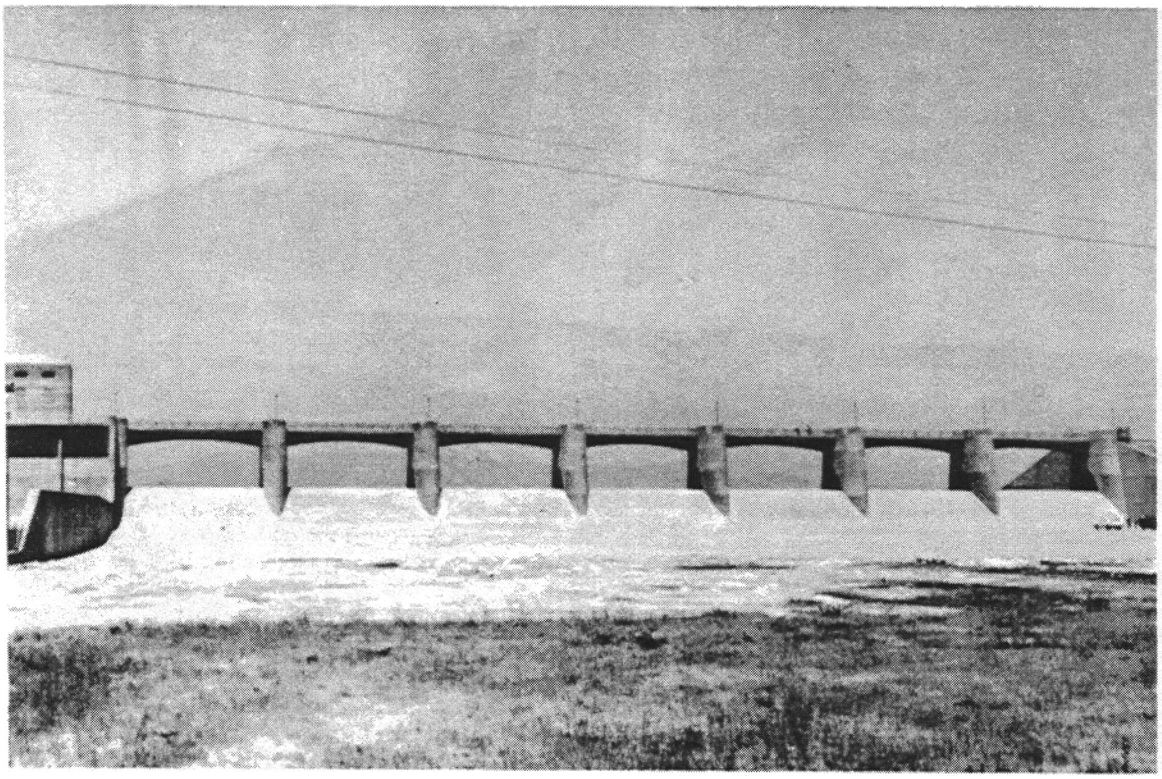

Photo No. 2-18. Spillway (Ogee type), with Control House and Outlet Works on left (view from downstream, below spillway apron).

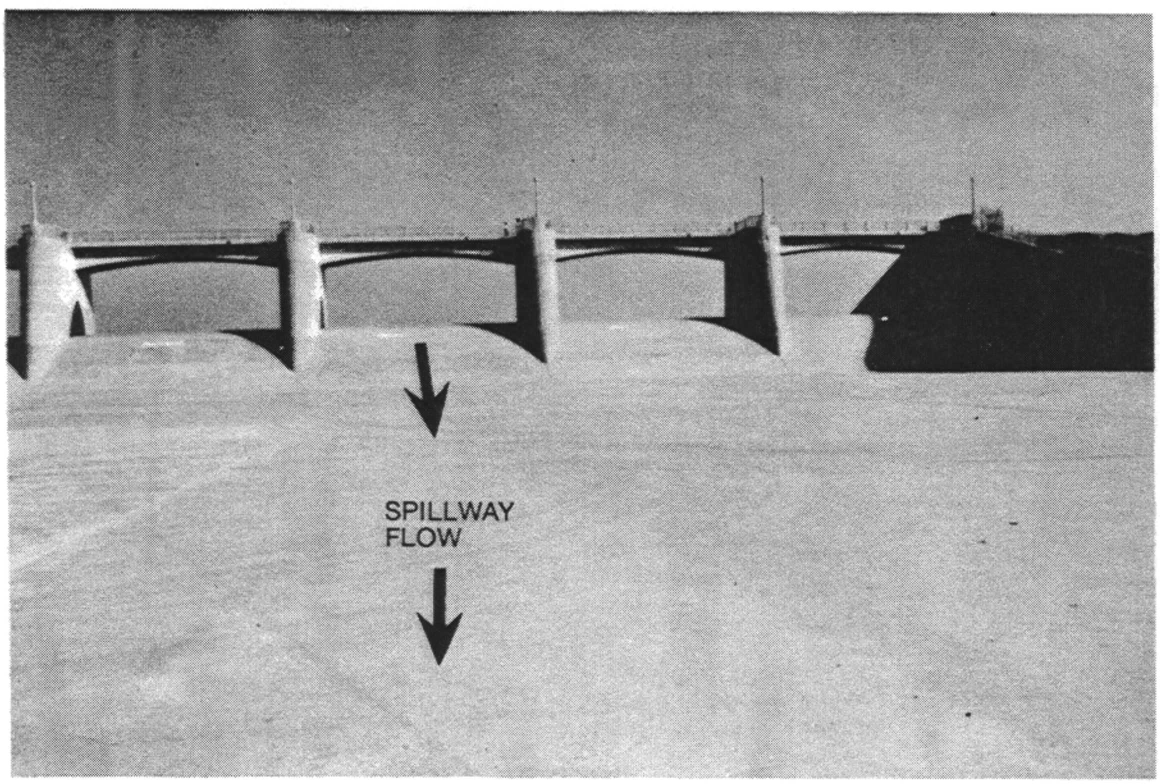

Photo No. 2-19. Spillway Apron (Spillway Outlet Channel), with portion of spillway in background (view from downstream, atop spillway apron).

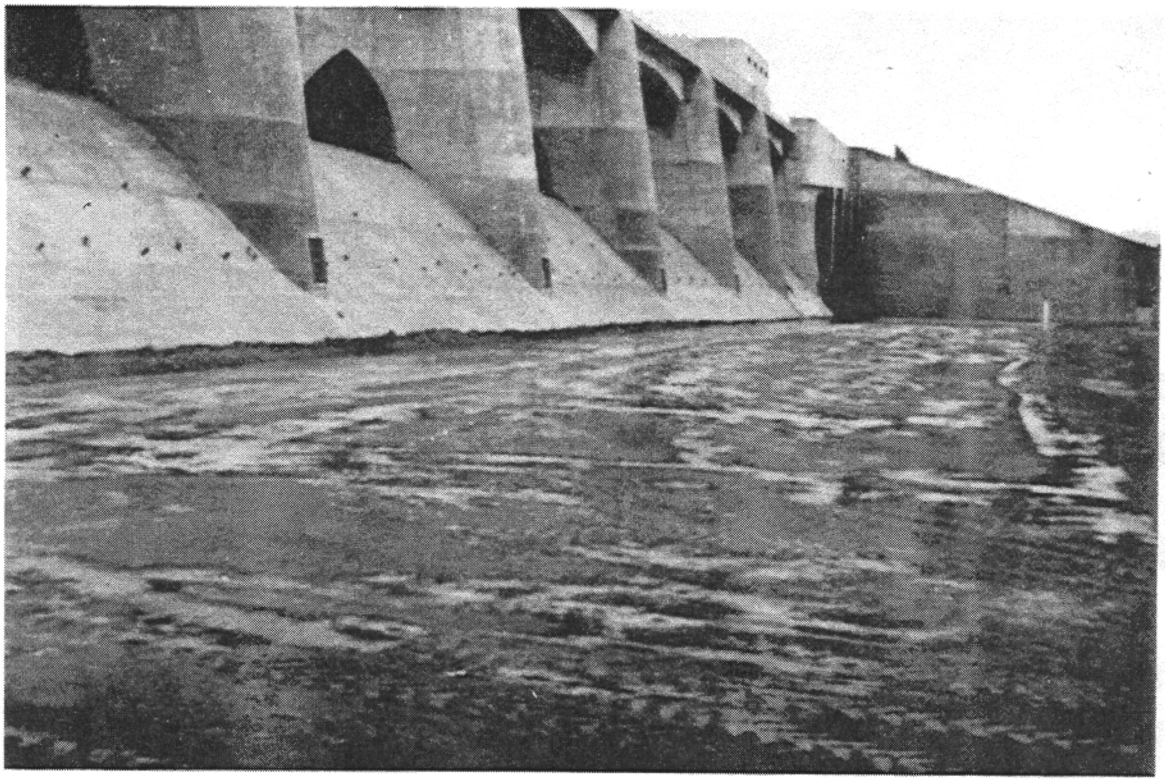

Photo No. 2-20. Approach to Spillway, with Spillway at left (view from approach slab to spillway, looking toward southwest).

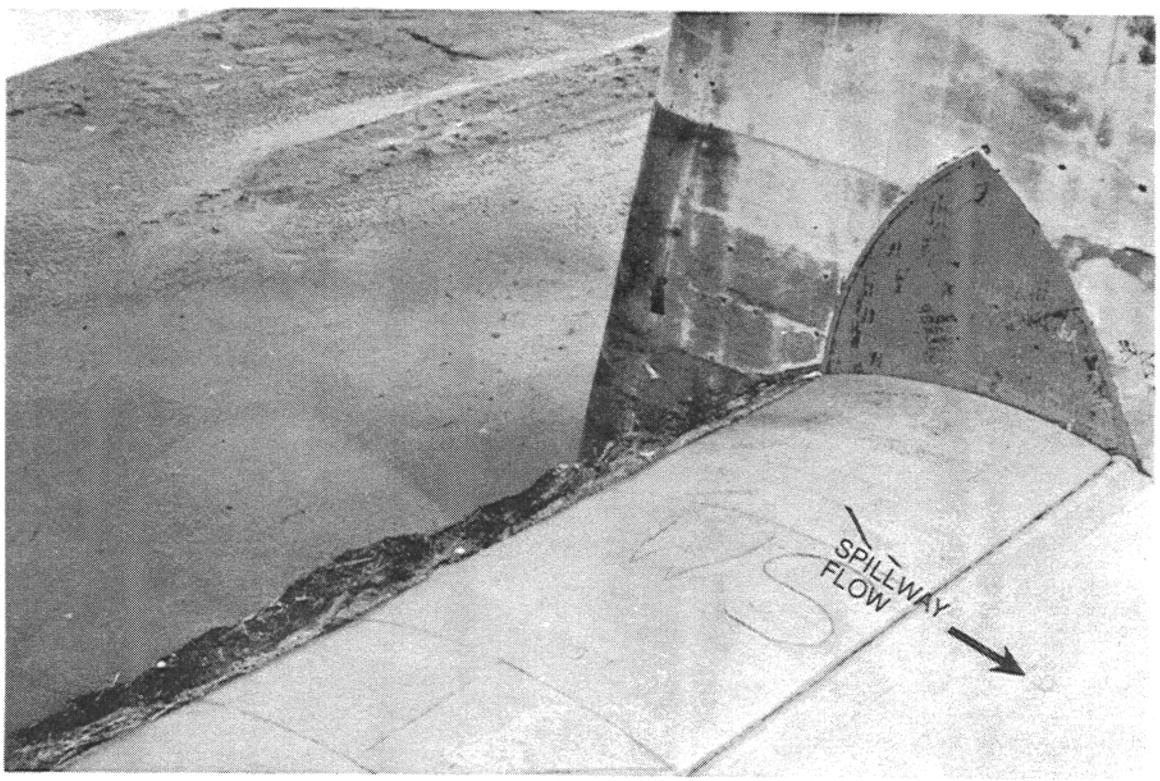

Photo No. 2-21. Spillway Gate in Lowered Position (view from spillway bridge, with reservoir to left).

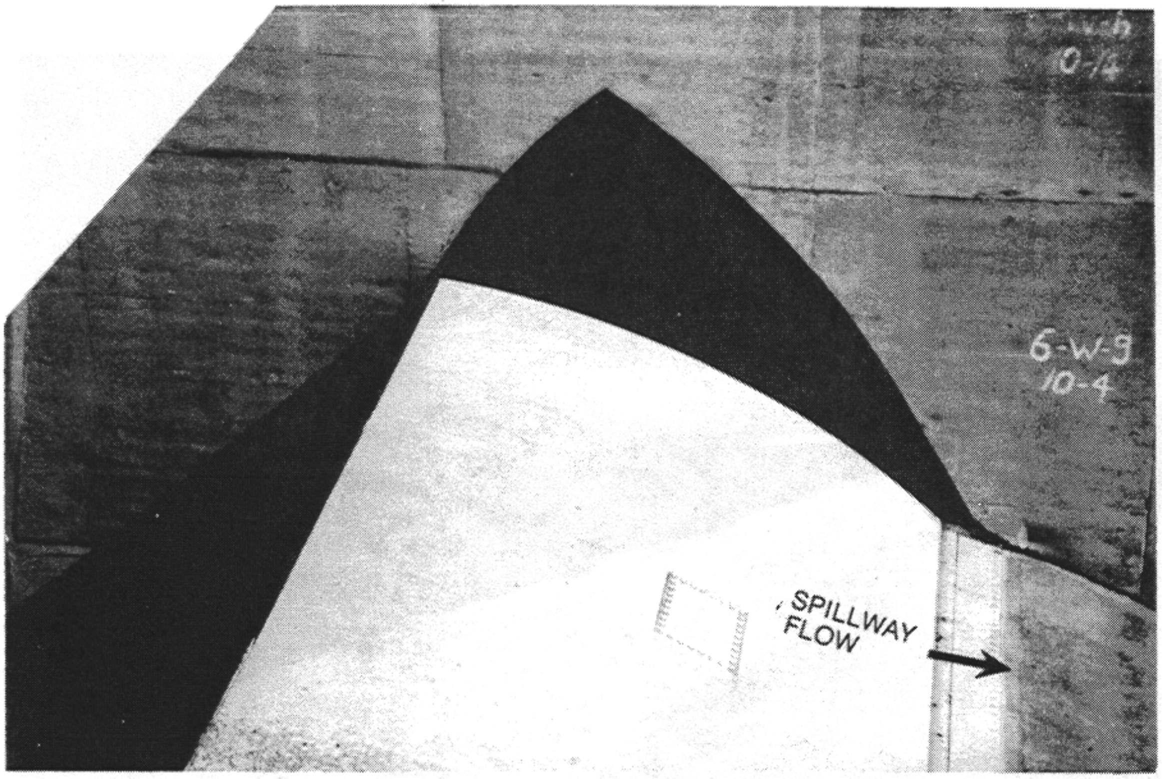

Photo No. 2-22. Spillway Gate Partially Raised (during test operation of spillway gates) (view from spillway bridge, with reservoir to left).

Photo No. 2-23. Spillway Apron, with Outlet Channel to right (view from spillway bridge, toward downstream).

Photo No. 2-24. Landscaped recreation area within reservoir (view toward south from near northeast end of dam).

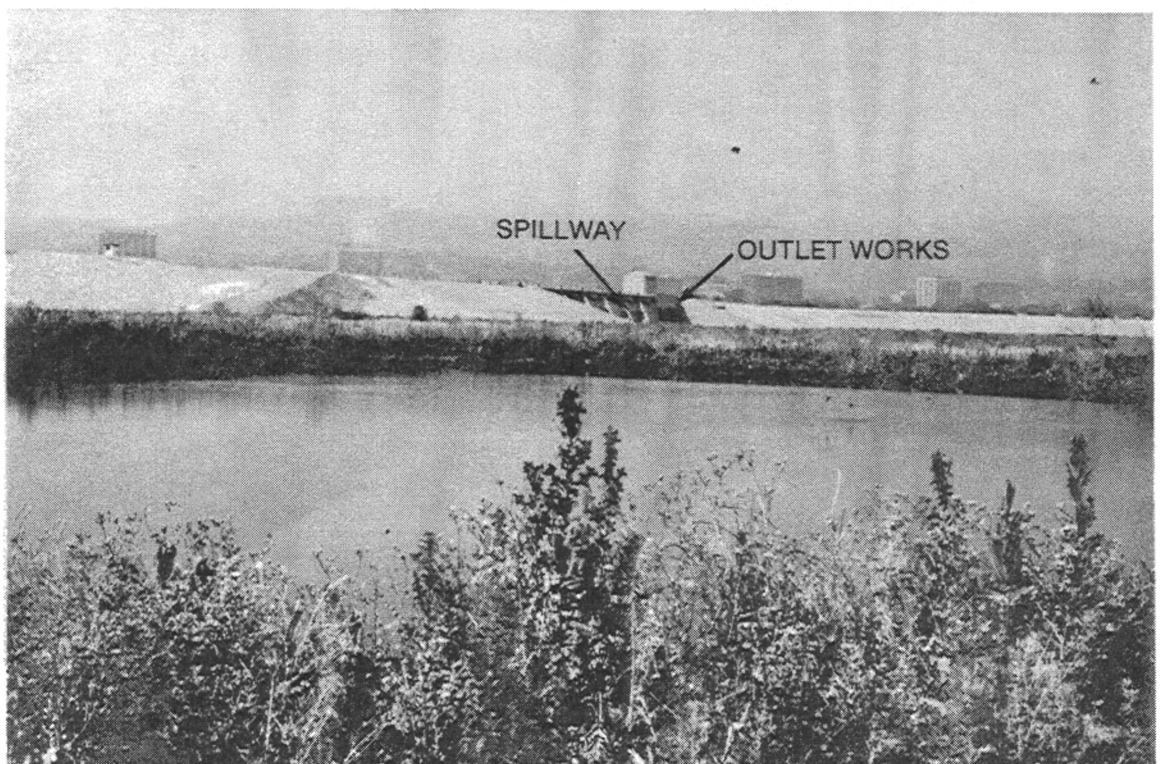

Photo No. 2-25. Wildlife Pond (view from within reservoir, looking downstream toward southeast).

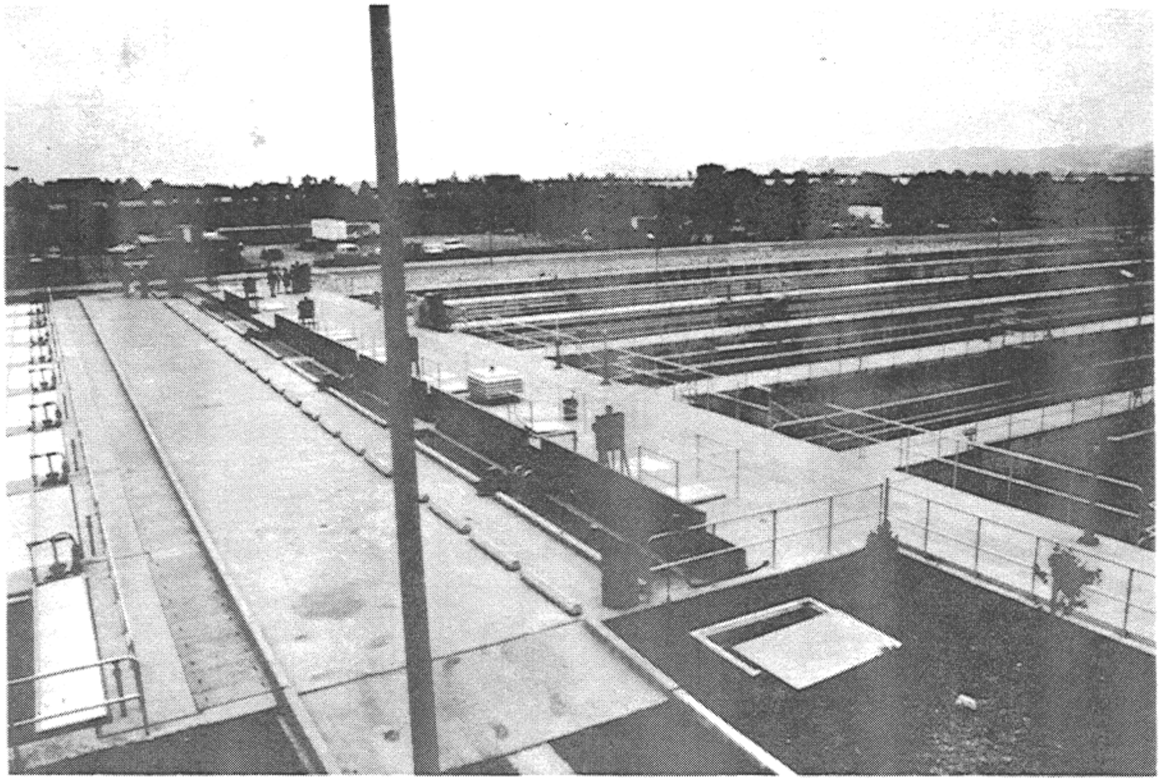

Photo No. 2-26. Donald C. Tillman Water Reclamation Plant (view toward northwest from atop plant building, located in northeastern portion of reservoir).

Photo No. 2-27. Japanese Garden (constructed as mitigation for the Donald C. Tillman Water Reclamation Plant)