Plate 1-01

Related Manuals and Reports

No.	Title	Date
1.	Orange County Flood Control District "The Control of Floods and Conservation of Water in Orange County California."	APR 1929
2.	Orange County Flood Control District, "Engineering and Geological Reports for Flood Control and Conservation Project of Orange County Flood Control District."	APR 1931
3.	U.S. Engineers Office, Los Angeles, California, "Definite Project for the Construction of Reservoirs and Related Flood-Control Works in Orange County, California, Authorized by the Flood-Control Act of 1936.	DEC 1936
4.	U.S. Engineers Office, Los Angeles, California, "Orange County Flood Control Project for Prado Retarding Basin, Engineering Data and Cost Estimate."	DEC 1936
5.	U.S. Engineers Office, Los Angeles, California, "Basis for Design, Santa Ana River Improvement."	APR 1938
6.	U.S. Engineers Office, Los Angeles, California, "The Santa Ana River, California, Flood Control."	JUL 1939
7.	House Document No. 135, 81st Congress, 1st. Session; A letter from the Secretary of the Army entitled: "Santa Ana River and Tributaries, California". The letter was referred to the Committee on Public Works.	MAR 1949
8.	U.S. Engineers Office, Los Angeles, California, "The Santa Ana Basin, California, Flood Control Operation and Maintenance Manual for Prado Dam."	MAY 1963
9.	U.S. Engineers Office, Los Angeles, California, "Prado Dam - Proposed Plugging of Ungated Outlets."	JUN 1969
10.	U.S. Engineers Office, Los Angeles, California, "Interim Report, Review of Design Features of Existing Dams, Hydrology and Hydraulic Review of Prado, Brea, Fullerton, and Salinas Dams."	NOV 1969
11.	U.S. Engineers Office, Los Angeles, California, "Santa Ana River Basin, California, Prado Dam, Santa Ana River, California, Dam, Outlet Works, and Spillway Periodic Inspection and Continuing Evaluation Report #1.	SEP 1971
12.	U.S. Engineers Office, Los Angeles, California, "Supplement A - Hydraulic Review of Prado Dam."	APR 1972
13.	U.S. Engineers Office, Los Angeles, California, "Hydrology, Santa Ana River Below Prado Dam."	JUL 1974
14.	U.S. Engineers Office, Los Angeles, California, "Review Report on the Santa Ana River Main Stem - Including Santiago Creek and Oak Street Drain, for Flood Control and Allied Purposes."	DEC 1975
15.	U.S. Engineers Office, Los Angeles, California, "Santa Ana River Basin, Riverside County, California, Santiago River, Outlet Works and Spillway Periodic Inspection Report #2."	MAY 1976
16.	U.S. Engineers Office, Los Angeles, California, "Santa Ana River - Phase 1 GDM on the Santa Ana River Main Stem including Santiago Creek."	SEP 1980
17.	U.S. Engineers Office, Los Angeles, California, "Santa Ana River Basin, Riverside County, California, Santa Ana River Dam, Outlet Works and Spillway Period Inspection Report #3."	MAY 1981
18.	U.S. Engineers Office, Los Angeles, California, "Coyote Creek Tributaries, Santa Ana River Basin, Orange County, California, Interim 3 Hydrology Documentation."	1984

Plate 1-01

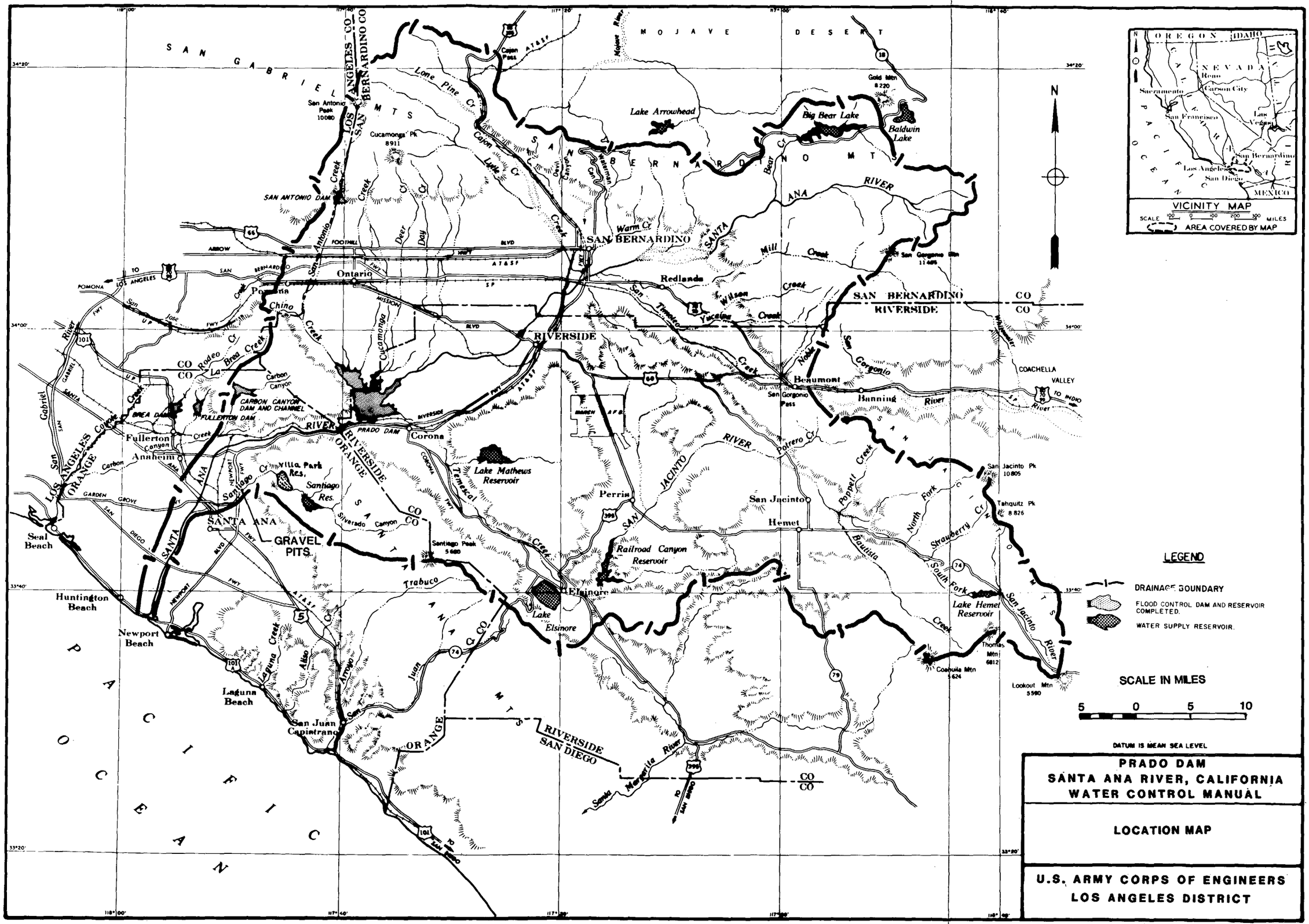
Related Manuals and Reports

No.	Title	Date
19.	U.S. Engineers Office, Los Angeles, California, "Operation of Prado Dam for Water Conservation/Water Supply."	AUG 1985
20.	U.S. Engineers Office, Los Angeles, California, "Preliminary, Prado Dam Basin, Land Use Analysis Report, Santa Ana River Main Stem including Santiago Creek."	SEP 1985
21.	U.S. Engineers Office, Los Angeles, California, "Upper Santa Ana River, Flood Alternative Study, Supplement to Phase 1 GDM on the Santa Ana River Main Stem including Santiago Creek."	DEC 1985
22.	U.S. Engineers Office, Los Angeles, California, "Santa Ana River Real-Time Water Control System".	FEB 1987
23.	U.S. Engineers Office, Los Angeles, California, Hydrology Appendix H to the "Prado Dam Water Conservation Study".	JUN 1988
24.	U.S. Engineers Office, Los Angeles, California, "Santa Ana River; Design Memorandum No. 1, Phase II General Design Memorandum on the Santa Ana River Mainstem, including Santiago Creek". The GDM is comprised of a Main Report and nine appendixes.	AUG 1988
25.	Historical Correspondence Files	

PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

RELATED MANUALS AND REPORTS

U. S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT



PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

LOCATION MAP

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 2-01

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GATE OPENING IN FEET

1 2 3 4 5 6 7 8 9 10 11 12

RESERVOIR WATER SURFACE ELEVATION IN FEET MEAN SEA LEVEL

560 550 540 530 520 510 500 490 480 470 460

TOP OF DAM ELEVATION 566

SPILLWAY CREST ELEVATION 543

SEE PLATE 2-06c

SEE PLATE 2-06b

GATE SILL ELEVATION 460

0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62

DISCHARGE IN HUNDRED CUBIC FEET PER SECOND

NOTE: TOTAL DISCHARGE IS THE SUM OF SIX GATED OUTLETS; BUT DISCHARGE THROUGH GATES 1, 2 AND 3 OR 4, 5 AND 6 CAN NOT EXCEED THE CAPACITY OF ONE 13.5' BY 13.5' CONDUIT. Q = 8,500 cfs

PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

OUTLET DISCHARGE CURVES

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 2-06a

RESERVOIR W.S. ELEVATION – FEET ABOVE M.S.L.

479
478
477
476
475
474
473
472
471
470
469
468
467
466
465
464
463
462
461
460

0
100
200
300
400
500
600

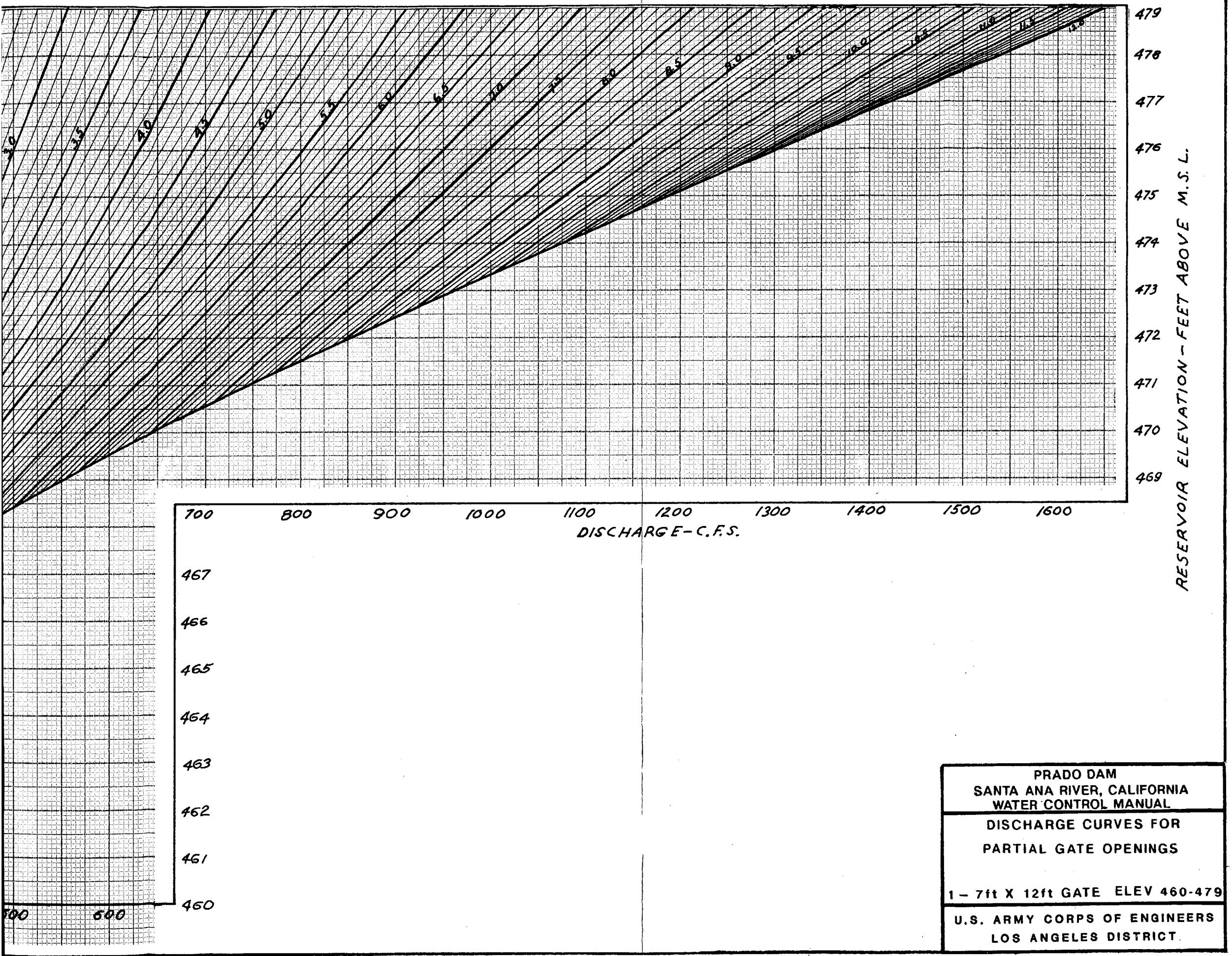
Gate Opening 0.5 Feet

1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
7.0
7.5
8.0
8.5
9.0

700
800
900
1000
1100
1200
1300

DISCHARGE – C.F.S.

467
466
465
464
463
462
461
460



PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

DISCHARGE CURVES FOR

PARTIAL GATE OPENINGS

1 – 7ft X 12ft GATE ELEV 460-479

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 2-06b

RESERVOIR W. S. ELEVATION - FEET M.S.L.

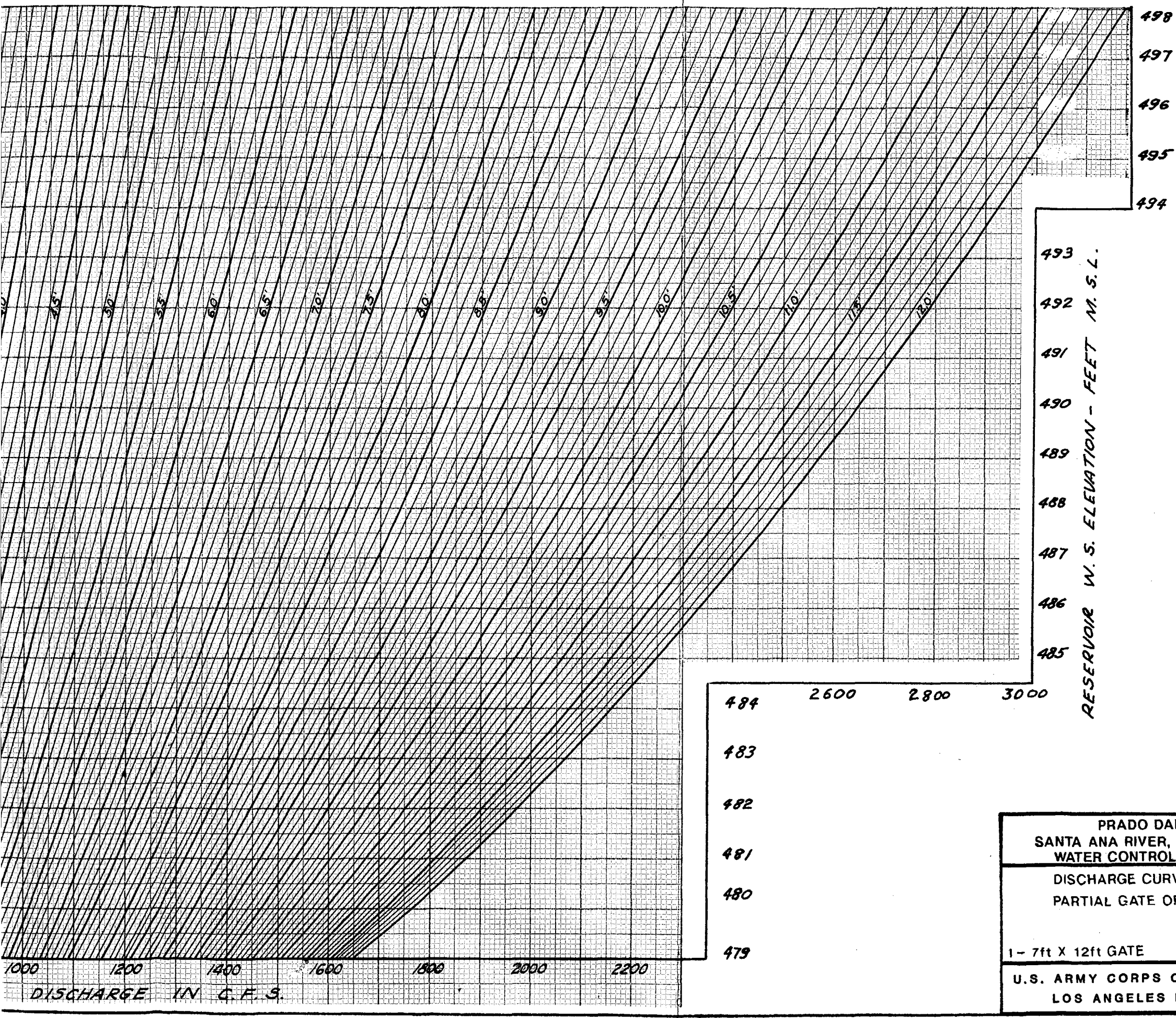
498
497
496
495
494
493
492
491
490
489
488
487
486
485
484
483
482
481
480
479

Gate opening 0.5 feet
1.0'
1.5'
2.0'
2.5'
3.0'
3.5'
4.0'
4.5'
5.0'
5.5'
6.0'
6.5'
7.0'
7.5'
8.0'
8.5'
9.0'
9.5'
10.0'
10.5'
11.0'

0 200 400 600 800 1000 1200 1400 1600 1800 2000 2200

DISCHARGE IN C.F.S.

484 2600
483
482
481
480
479



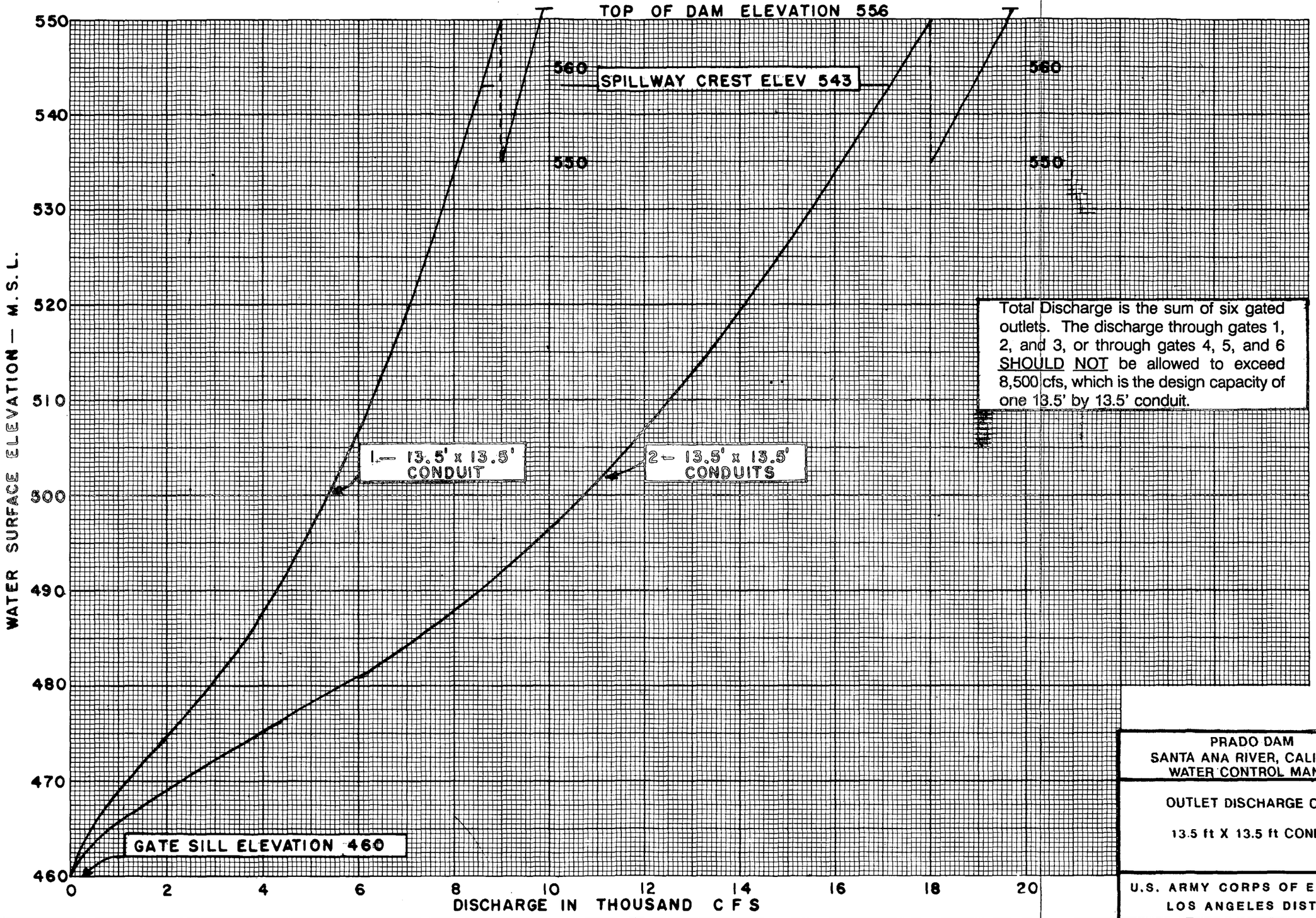
PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

DISCHARGE CURVES FOR
PARTIAL GATE OPENINGS

1 – 7ft X 12ft GATE ELEV 479 – 498

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 2-06c



Total Discharge is the sum of six gated outlets. The discharge through gates 1, 2, and 3, or through gates 4, 5, and 6 SHOULD NOT be allowed to exceed 8,500 cfs, which is the design capacity of one 13.5' by 13.5' conduit.

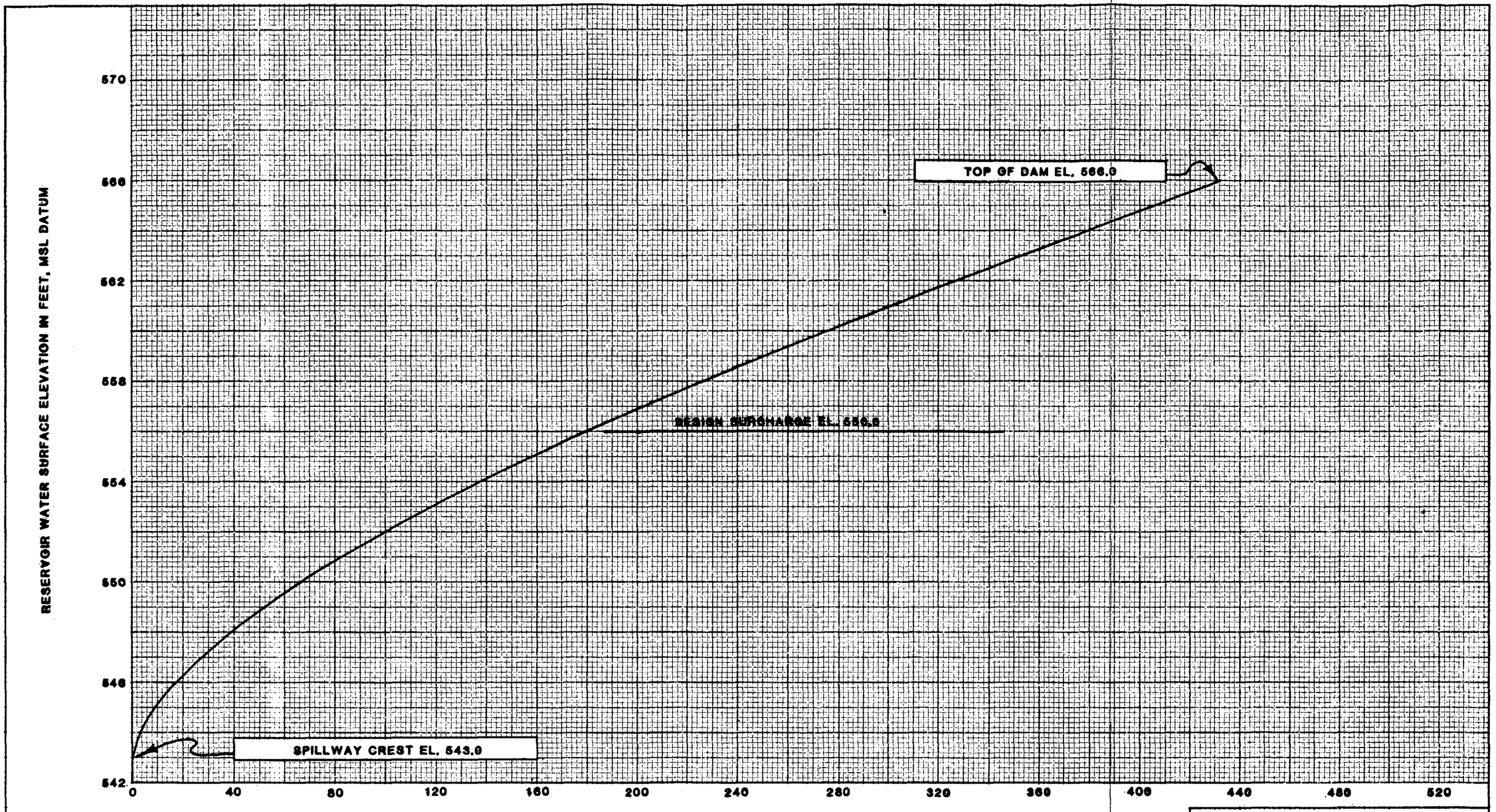
PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

OUTLET DISCHARGE CURVE

13.5 ft X 13.5 ft CONDUITS

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 2-06d



PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

SPILLWAY DISCHARGE CURVE

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 2-07

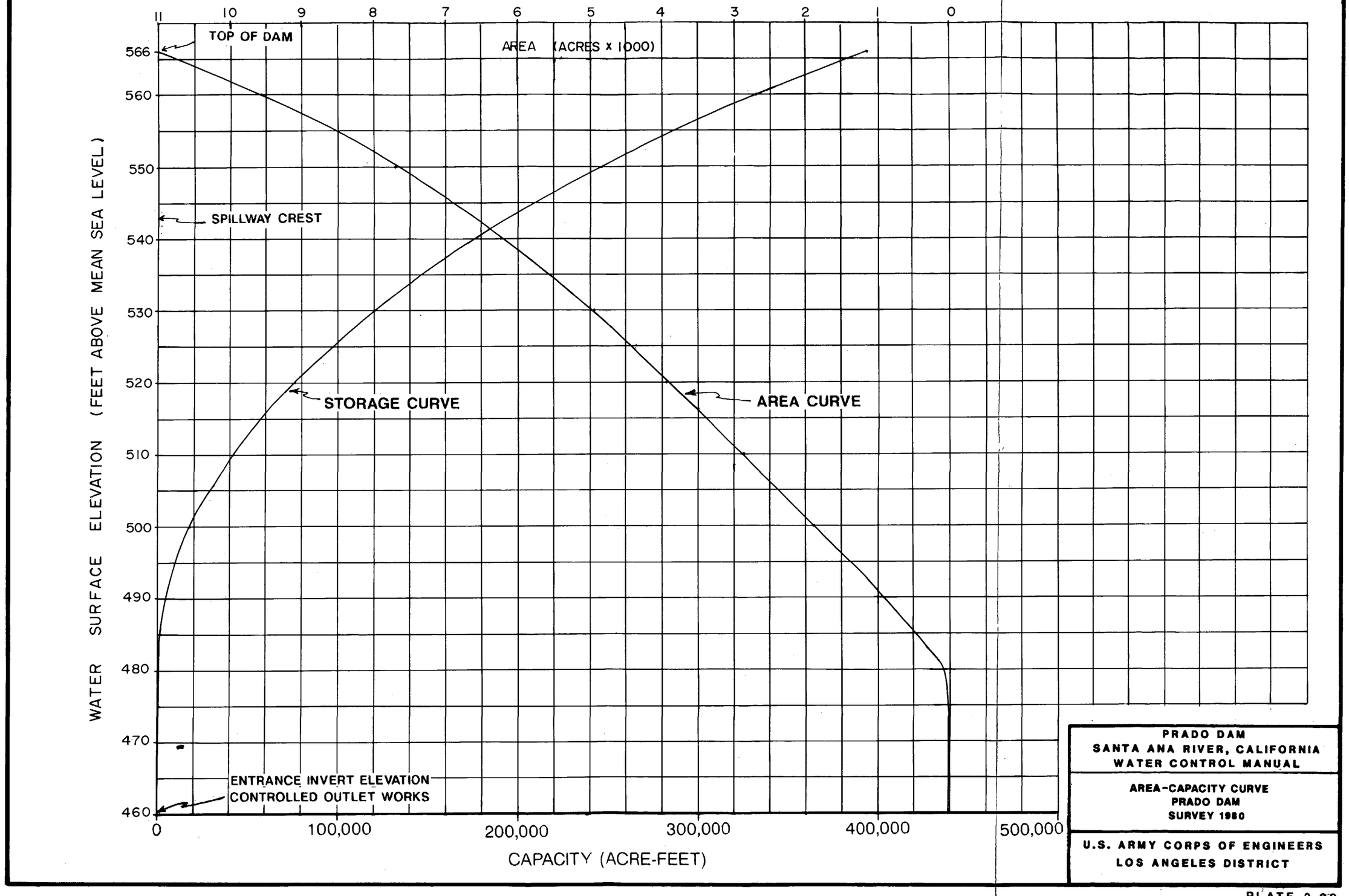
ELEVATION (FEET)	STORAGE (ACRE-FEET)	CAPACITY TO SPILLWAY (PERCENT)	AREA (ACRES)	MAXIMUM DEPTH (FEET)	ELEVATION (FEET)	STORAGE (ACRE-FEET)	CAPACITY TO SPILLWAY (PERCENT)	AREA (ACRES)	MAXIMUM DEPTH (FEET)	ELEVATION (FEET)	STORAGE (ACRE-FEET)	CAPACITY TO SPILLWAY (PERCENT)	AREA (ACRES)	MAXIMUM DEPTH (FEET)
460	0.0	0.00	0.00	0	498	14857	7.57	1,680.19	38	536	153,036	77.99	5,732.55	76
461	0.0	0.00	0.00	1	499	16590	8.45	1,759.12	39	537	158,832	80.94	5,858.14	77
462	0.0	0.00	0.00	2	500	18426	9.39	1,838.04	40	538	164,753	83.96	5,983.72	78
463	0.1	0.00	0.10	3	501	20369	10.38	1,973.65	41	539	170,798	87.04	6,106.04	79
464	0.2	0.00	0.20	4	502	22423	11.43	2,109.26	42	540	176,965	90.18	6,228.35	80
465	0.6	0.00	0.56	5	503	24580	12.53	2,204.52	43	541	183,257	93.39	6,356.52	81
466	1.3	0.00	0.92	6	504	26832	13.67	2,299.78	44	542	189,678	96.66	6,484.69	82
467	2.4	0.00	1.23	7	505	29183	14.87	2,402.27	45	543	196,235	100.00	6,630.01	83
468	3.8	0.00	1.53	8	506	31636	16.12	2,504.76	46	544	202,938	103.42	6,775.33	84
469	5.5	0.00	1.89	9	507	34188	17.42	2,597.39	47	545	209,785	106.90	6,920.00	85
470	7.6	0.00	2.25	10	508	36831	18.77	2,690.02	48	546	216,778	110.47	7,064.66	86
471	10.2	0.01	3.07	11	509	39566	20.16	2,778.81	49	547	223,924	114.11	7,227.28	87
472	13.7	0.01	3.89	12	510	42389	21.60	2,867.60	50	548	231,232	117.83	7,389.90	88
473	18.4	0.01	5.53	13	511	45318	23.09	2,990.71	51	549	238,698	121.64	7,541.45	89
474	24.7	0.01	7.16	14	512	48370	24.65	3,113.81	52	550	246,315	125.52	7,692.99	90
475	33.6	0.02	10.59	15	513	51534	26.26	3,213.23	53	551	254,094	129.48	7,865.32	91
476	45.9	0.02	14.02	16	514	54797	27.92	3,312.64	54	552	262,046	133.54	8,037.64	92
477	67.2	0.03	28.60	17	515	58167	29.64	3,428.10	55	553	270,165	137.67	8,199.70	93
478	103.1	0.05	43.18	18	516	61653	31.42	3,543.55	56	554	278,445	141.89	8,361.75	94
479	158.7	0.08	68.04	19	517	65229	33.24	3,649.53	57	555	286,910	146.21	8,567.65	95
480	239.2	0.12	92.90	20	518	68952	35.14	3,755.51	58	556	295,581	150.63	8,773.54	96
481	347.7	0.18	104.19	21	519	72753	37.07	3,847.18	59	557	304,449	155.15	8,964.40	97
482	487.6	0.25	115.48	22	520	76646	39.06	3,938.84	60	558	313,509	159.76	9,155.25	98
483	664.1	0.34	177.51	23	521	80635	41.09	4,039.47	61	559	322,765	164.48	9,355.41	99
484	882.6	0.45	239.54	24	522	84725	43.18	4,140.10	62	560	332,220	169.30	9,555.57	100
485	1,188.4	0.61	372.14	25	523	88912	45.31	4,233.38	63	561	341,885	174.22	9,775.03	101
486	1,626.9	0.83	504.74	26	524	93192	47.49	4,326.65	64	562	351,770	179.26	9,994.49	102
487	2,183.3	1.11	608.10	27	525	97570	49.72	4,429.88	65	563	361,895	184.42	10,762.08	103
488	2,843.1	1.45	711.45	28	526	102052	52.00	4,533.11	66	564	372,281	189.71	10,516.68	104
489	3,606.5	1.84	815.41	29	527	106634	54.34	4,632.23	67	565	382,921	195.13	10,762.08	105
490	4,483.1	2.28	919.36	30	528	111316	56.73	4,731.35	68	566	393,806	200.68	11,007.48	106
491	5,442.0	2.77	1,016.65	31	529	116100	59.16	4,835.79	69					
492	6,507.0	3.32	1,113.94	32	530	120988	61.65	4,940.22	70					
493	7,666.0	3.91	1,203.96	33	531	125998	64.21	5,080.24	71					
494	8,915.0	4.54	1,293.97	34	532	131148	66.83	5,220.25	72					
495	10,257.0	5.23	1,389.02	35	533	136430	69.52	5,343.95	73					
496	11,693.0	5.96	1,484.06	36	534	141836	72.28	5,467.64	74					
497	13,226.0	6.74	1,582.13	37	535	147370	75.10	5,600.10	75					

PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

AREA - CAPACITY TABLE

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 2-08

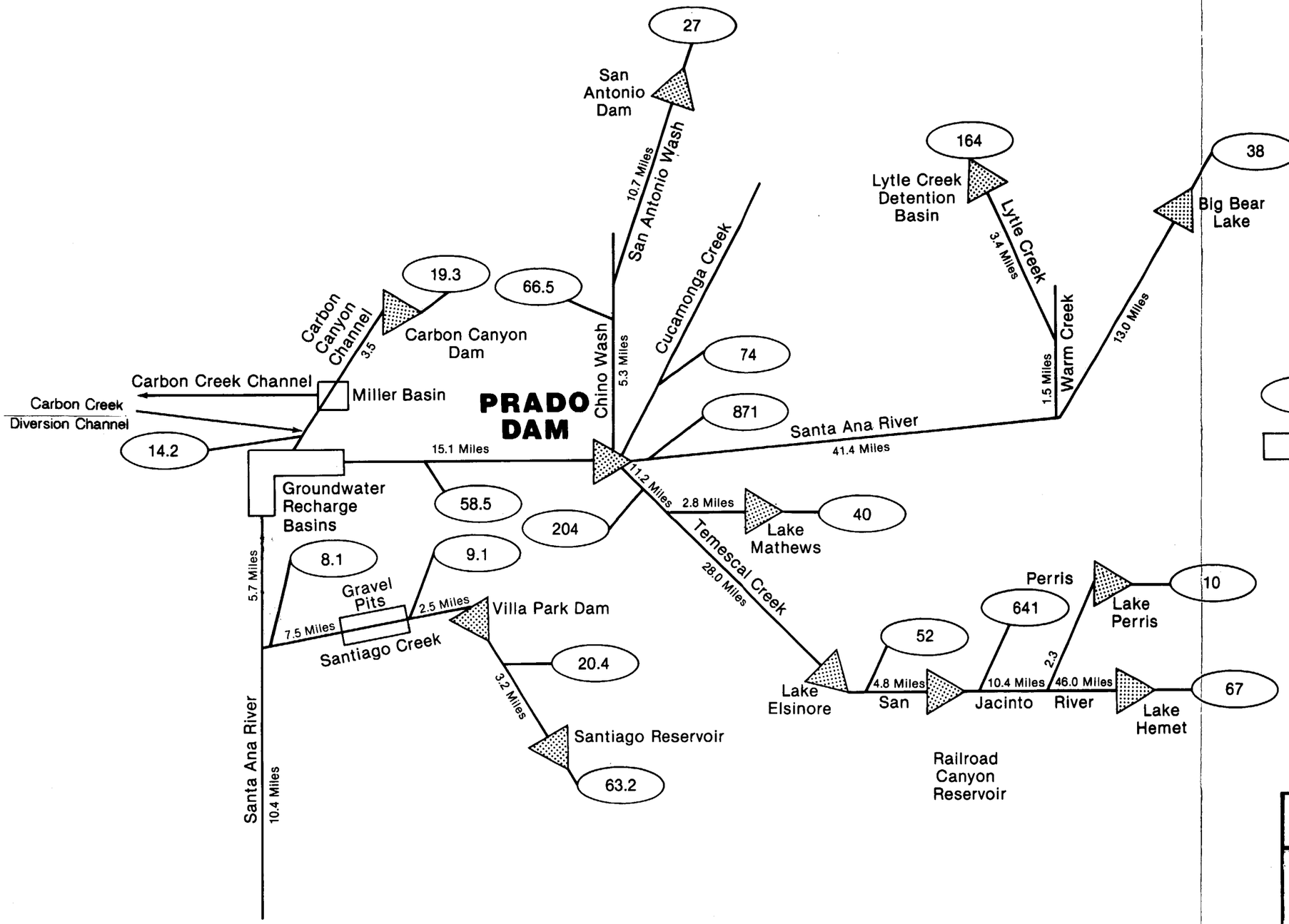


PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

AREA-CAPACITY CURVE
PRADO DAM
SURVEY 1980

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 2-09

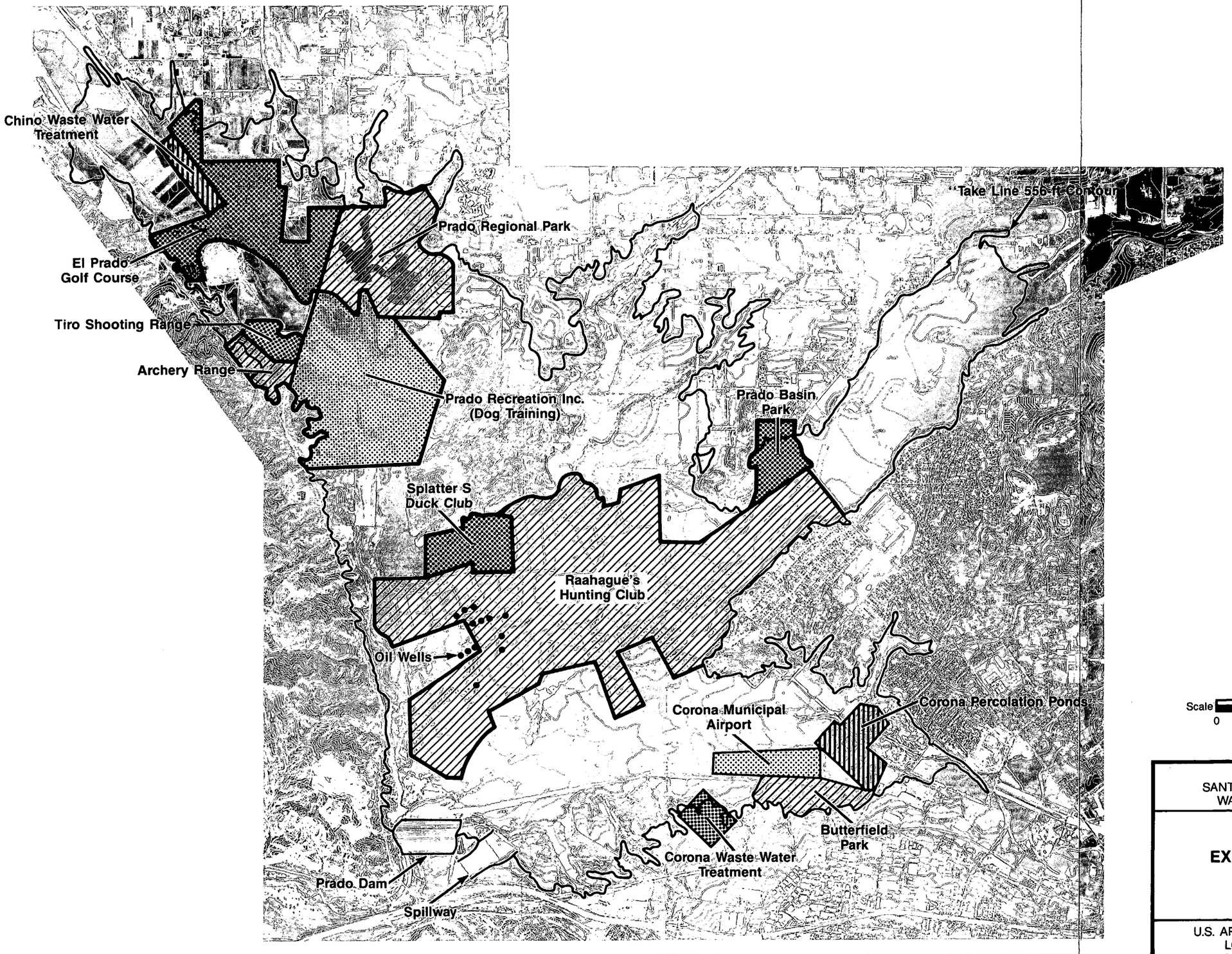


PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

SCHEMATIC
SANTA ANA RIVER
WATERSHED

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 2-10



N

Scale 0 1000 2000 3000 Feet

30 Acres

PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

EXISTING LAND USES
Revised 1990

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 2-11

DEMENS AND HILLSIDE CHANNELS
CUCAMONGA AND DEER CREEKS IMPROVEMENTS
SAN ANTONIO HEIGHTS DIVERSION SYSTEM
SAN ANTONIO FLOOD-CONTROL RESERVOIR
SAN ANTONIO AND CHINO CREEKS CHANNEL
LYTLE AND CAJON CREEKS CHANNEL IMPROVEMENTS
DEVIL, EAST TWIN & WARM CREEKS IMPROVEMENTS & LYTLE CREEK LEVEE
MILL CREEK LEVEES
CITY CREEK LEVEE
RIVERSIDE LEVEES
LYTLE AND WARM CREEKS CHANNEL AND LEVEES
PRADO FLOOD CONTROL RESERVOIR
CARBON CANYON DAM AND CHANNEL
BREA DAM
FULLERTON DAM
SANTA ANA RIVER CHANNEL — ORANGE CO. ENVIRONMENTAL MANAGEMENT AGENCY
SAN JACINTO RIVER LEVEE & BAUTISTA CREEK CHANNEL

VICINITY MAP
SCALE 0 50 MILES
AREA COVERED BY MAP

LEGEND

- BOUNDARY OF DRAINAGE AREA
- BOUNDARY OF SUBAREAS
- BOUNDARY OF INEFFECTIVE AREA
- FLOOD-CONTROL CHANNEL OR LEVEE.
- EXISTING FLOOD CONTROL BASIN.
- WATER CONSERVATION RESERVOIR
- NATURAL DRAINAGE IS TO THE SAN GABRIEL RIVER WITH A DIVERSION TO THE SANTA ANA RIVER.
- RESERVOIR POOL

SCALE IN MILES
5 0 5 10

PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

EXISTING STRUCTURES

US ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 4-01a

LEGEND

DRAINAGE AREA BOUNDARY

LAKE OR RESERVOIR

ORANGE COUNTY BOUNDARY

N

HIGHEST POINT IN THE DRAINAGE BASIN, MT. SAN GORGONIO, ELEVATION 11502 FT.

SCALE 1:500,000

1 inch equals approximately 8 miles

10 0 10

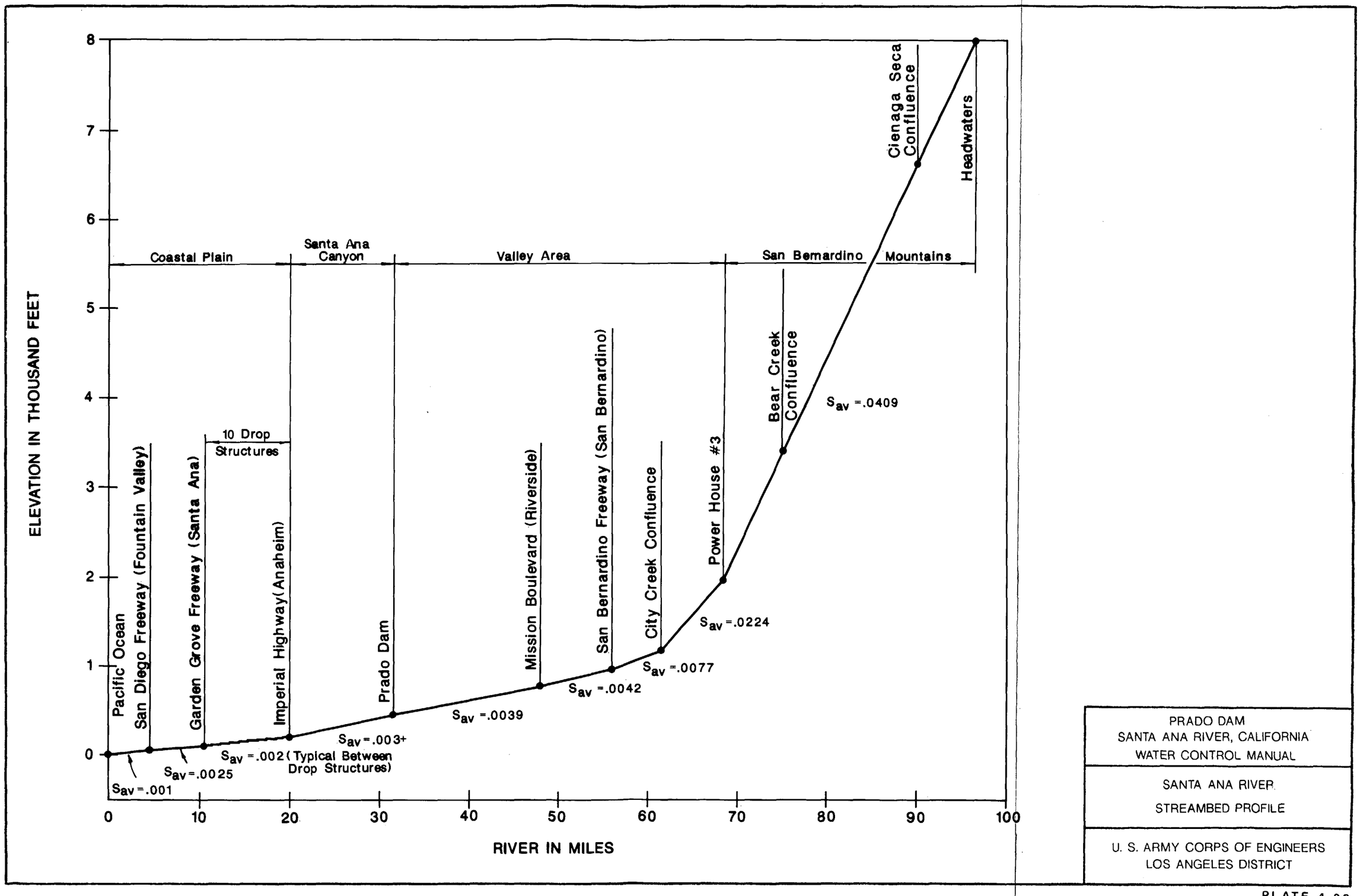
Contour interval = 500 feet

PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

SANTA ANA RIVER BASIN TOPOGRAPHY

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 4-01b

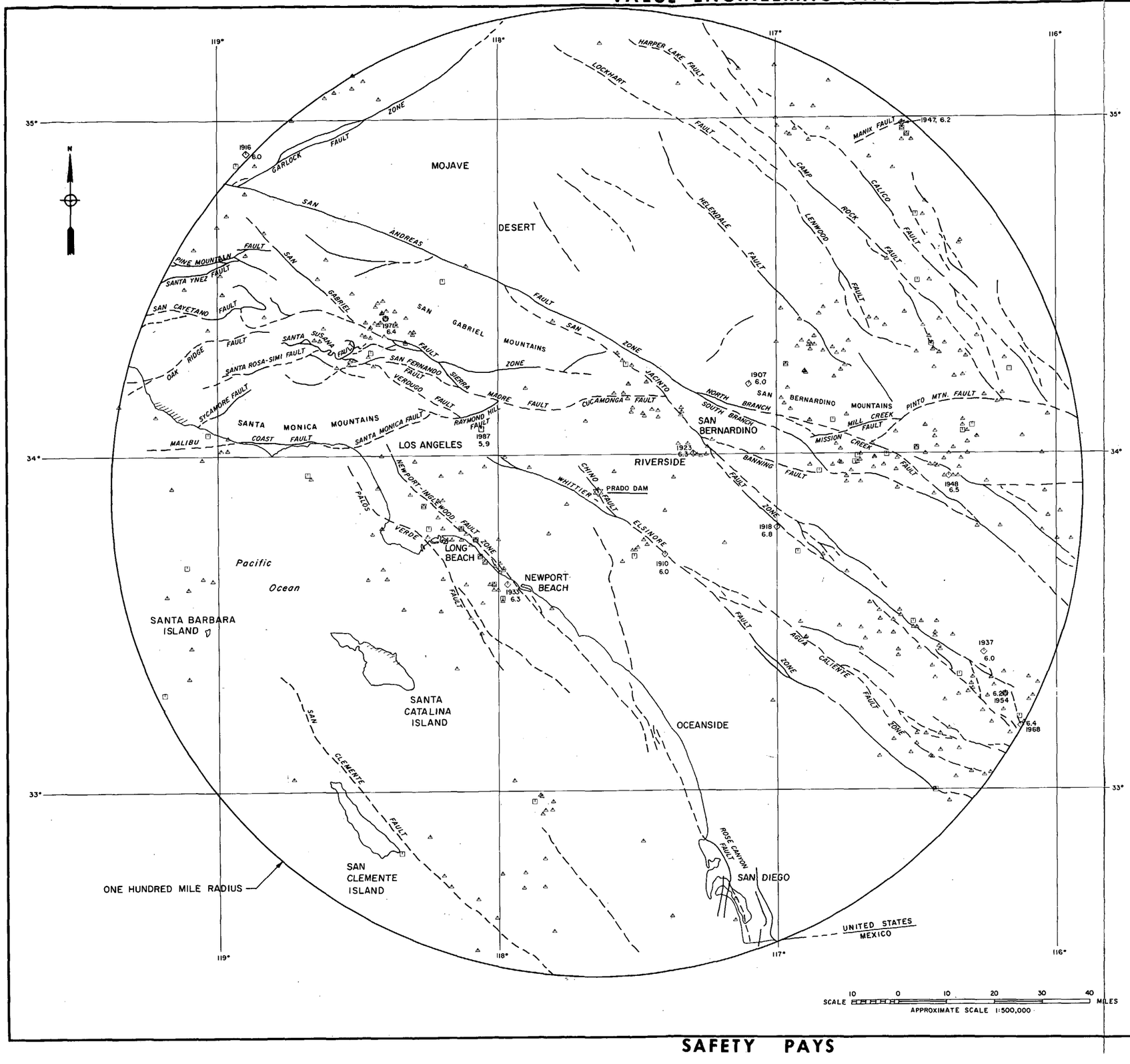


PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

SANTA ANA RIVER
STREAMBED PROFILE

U. S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 4-02



LEGEND

- EARTHQUAKE WITH MAGNITUDE 4.0 THRU 4.99
- EARTHQUAKE WITH MAGNITUDE 5.0 THRU 5.99
- EARTHQUAKE WITH MAGNITUDE 6.0 THRU 6.99
- LOCATION OF PROJECT AREA
- TRACE OF FAULT DASHED WHERE INFERRED OR CONCEALED

NOTES:

1. Richter scale magnitudes are a measure of the energy released at the focus (center of the earthquake) as determined by the amplitudes produced on a seismogram.
2. The epicenter is the point on the earth's surface directly above the focus.
3. Earthquake epicenters plotted are from 1932 to 1987, unless earlier dates are shown.
4. Base map modified from state of California (South Half) 1:500,000 topographic map; United States Geological Survey, 1981.
5. Locations of faults are approximate. Data derived from various California Division of Mines and Geology and United States Geological Survey publications.
6. Earthquake epicenter locations are from California Institute of Technology's seismologic data base for Southern California, Nevada, and Arizona; from Topporzada and others (1981), and from Topporzada and Parke (1982).

PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

EARTHQUAKE EPICENTER AND FAULT LOCATION MAP

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 4-03

CLIMATOLOGICAL SUMMARY FOR CORONA, CALIFORNIA

PERIOD: 1951-80
ELEVATION: 710 FT

	TEMPERATURE (F)					PRECIPITATION TOTALS (INCHES)							
	MEANS			EXTREMES							SNOW		
	DAILY MAXIMUM*	DAILY MINIMUM*	MONTHLY*	RECORD HIGHEST	RECORD LOWEST	MEAN*	GREATEST MONTHLY*	YEAR	GREATEST DAILY	YEAR	MEAN	MAXIMUM MONTHLY	YEAR
JAN	66.2	40.2	53.2	91+	23+	2.72	10.90	69	3.66	69	.0	.0	
FEB	68.8	41.4	55.1	93	26+	2.34	9.98	80	2.68	63	.0	.0	
MAR	70.2	42.6	56.4	96+	28+	1.75	5.23	78	2.20	68	.0	.0	
APR	74.2	45.6	59.9	99+	30+	.94	4.42	58	1.37	58	.0	.0	
MAY	78.6	50.3	64.5	105+	36	.21	1.24	77	.71	74	.0	.0	
JUN	84.6	54.4	69.6	110+	42+	.03	.47	72	.33	72	.0	.0	
JUL	91.9	58.5	75.2	110+	47+	.04	.36	68	.3	56	.0	.0	
AUG	91.4	59.0	75.2	109+	43	.12	1.84	77	1.67	77	.0	.0	
SEP	89.2	56.1	72.7	114+	41	.29	3.67	63	1.30	63	.0	.0	
OCT	82.2	50.3	66.3	106+	29	.19	1.66	57	.68	57	.0	.0	
NOV	73.6	43.8	58.7	96+	26	1.25	7.08	65	2.23	65	.0	.0	
DEC	67.7	40.0	53.9	94+	22	1.72	6.24	51	2.26	74	.0	1.0	68
YEAR	78.2	48.5	63.4	114	22	11.60	10.90	JAN 69	3.66	JAN 69	.0	1.0	DEC 68

* FROM 1951 - 80 NORMALS # ESTIMATED VALUE BASED ON DATA FROM SURROUNDING STATIONS + ALSO ON EARLIER DATES

PROBABILITY THAT THE MONTHLY PRECIPITATION WILL BE EQUAL TO OR LESS THAN THE INDICATED PRECIPITATION AMOUNT
MONTHLY PRECIPITATION (INCHES) **

	PROBABILITY LEVELS										
	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
JAN	.00	.16	.56	.98	1.43	1.95	2.57	3.35	4.43	6.25	8.06
FEB	.00	.05	.29	.59	.96	1.43	2.01	2.78	3.89	5.83	7.80
MAR	.00	.00	.38	.68	.98	1.32	1.71	2.20	2.85	3.93	4.98
APR	.00	.00	.06	.18	.34	.54	.79	1.12	1.60	2.43	3.28
MAY	.00	.00	.00	.00	.01	.04	.10	.20	.35	.65	.96
JUN	.00	.00	.00	.00	.00	.00	.00	.00	.02	.1	.22
JUL	.00	.00	.00	.00	.00	.00	.00	.00	.03	.14	.25
AUG	.00	.00	.00	.00	.00	.00	.00	.00	.10	.39	.73
SEP	.00	.00	.00	.00	.00	.00	.00	.08	.33	.96	1.60
OCT	.00	.00	.00	.00	.01	.05	.10	.19	.32	.56	.82
NOV	.00	.00	.13	.30	.50	.76	1.08	1.50	2.10	3.16	4.22
DEC	.00	.00	.13	.34	.62	.96	1.42	2.02	2.90	4.46	6.06

** THESE VALUES WERE DETERMINED FROM THE INCOMPLETE GAMA DISTRIBUTION

PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

CLIMATOLOGICAL SUMMARY
FOR
CORONA, CALIFORNIA

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 4-04a

CLIMATOLOGICAL SUMMARY FOR RIVERSIDE, CALIFORNIA

PERIOD: 1951-80
ELEVATION: 840 FT

	TEMPERATURE (F)					PRECIPITATION TOTALS (INCHES)						
	MEANS			EXTREMES							SNOW	
	DAILY MAXIMUM*	DAILY MINIMUM*	MONTHLY*	RECORD HIGHEST	RECORD LOWEST	MEAN*	GREATEST MONTHLY*	YEAR	GREATEST DAILY	YEAR	MEAN	MAXIMUM MONTHLY
JAN	66.0	39.5	52.8	90+	23+	2.17	6.67	69	2.70	56	.0	.0
FEB	68.8	41.1	55.0	92+	25+	1.77	8.00	69	2.41	69	.0	.0
MAR	70.4	42.9	56.7	97	25+	1.55	5.13	78	1.93	68	.0	.0
APR	74.7	46.3	60.5	100+	29+	.86	3.64	65	1.19	56	.0	.0
MAY	79.5	51.2	65.4	106+	37+	.23	1.63	77	.65	77	.0	.0
JUN	86.6	55.5	71.1	110	41+	.03	.37	72	.22	72	.0	.0
JUL	94.2	60.2	77.2	111+	43+	.08	1.26	56	1.26	56	.0	.0
AUG	93.4	60.4	77.0	109+	48+	.14	2.14	77	2.05	77	.0	.0
SEP	90.5	57.3	73.9	115+	44+	.31	3.91	63	1.37	63	.0	.0
OCT	82.5	50.6	66.6	109	30+	.20	1.42	57	.67	60	.0	.0
NOV	73.2	43.3	58.3	95+	25+	1.00	5.72	65	2.11	54	.0	.0
DEC	67.1	39.5	53.3	94+	24+	1.30	5.49	51	2.17	51	.0	.0
YEAR	78.9	49.0	64.0	115	23	9.64	8.00	FEB 69	2.70	JAN 56	.0	.0

PROBABILITY THAT THE MONTHLY PRECIPITATION WILL BE EQUAL TO OR LESS THAN THE INDICATED PRECIPITATION AMOUNT
MONTHLY PRECIPITATION (INCHES) **

	PROBABILITY LEVELS										
	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
JAN	.00	.13	.45	.78	1.15	1.56	2.06	2.68	3.54	5.00	6.43
FEB	.00	.04	.23	.46	.74	1.09	1.53	2.11	2.94	4.39	5.85
MAR	.00	.00	.31	.57	.84	1.14	1.50	1.94	2.53	3.53	4.50
APR	.00	.00	.02	.11	.25	.43	.67	.99	1.47	2.32	3.19
MAY	.00	.00	.00	.00	.02	.06	.13	.23	.38	.68	.99
JUN	.00	.00	.00	.00	.00	.00	.00	.00	.01	.09	.18
JUL	.00	.00	.00	.00	.00	.00	.00	.00	.06	.27	.52
AUG	.00	.00	.00	.00	.00	.00	.02	.08	.20	.46	.75
SEP	.00	.00	.00	.00	.00	.00	.00	.08	.33	.99	1.62
OCT	.00	.00	.00	.00	.02	.07	.13	.22	.35	.60	.85
NOV	.00	.00	.07	.19	.35	.55	.81	1.17	1.69	2.62	3.57
DEC	.00	.02	.14	.29	.50	.75	1.08	1.52	2.17	3.30	4.46

* FROM 1951 - 80 NORMALS

\# ESTIMATED VALUE BASED ON DATA FROM SURROUNDING STATIONS

\+ ALSO ON EARLIER DATES

** THESE VALUES WERE DETERMINED FROM THE INCOMPLETE GAMA DISTRIBUTION

PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

CLIMATOLOGICAL SUMMARY

FOR

RIVERSIDE, CALIFORNIA

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 4-04b

CLIMATOLOGICAL SUMMARY FOR UPLAND, CALIFORNIA

PERIOD: 1951-80
ELEVATION: 1605 FT

	TEMPERATURE (F)					PRECIPITATION TOTALS (INCHES)						
	MEANS			EXTREMES							SNOW	
	DAILY MAXIMUM*	DAILY MINIMUM*	MONTHLY*	RECORD HIGHEST	RECORD LOWEST	MEAN*	GREATEST MONTHLY*	YEAR	GREATEST DAILY	YEAR	MEAN	MAXIMUM MONTHLY
JAN	63.4	40.6	52.0	89+	25+	4.79	19.64	69	6.38	69	.0	.0
FEB	66.1	41.6	53.9	88+	29+	3.77	17.79	80	3.65	69	.0	.0
MAR	67.4	42.0	54.7	97+	29+	3.40	14.71	78	3.48	52	.0	.0
APR	71.8	44.5	58.2	100+	31+	1.70	6.81	58	2.75	58	.0	.0
MAY	76.3	48.5	62.4	104+	31	.57	4.03	77	2.01	77	.0	.0
JUN	83.4	52.5	68.0	109+	38+	.06	.42	67	.19	70	.0	.0
JUL	91.8	58.1	75.0	111+	44+	.05	.86	68	.84	68	.0	.0
AUG	90.9	58.6	74.8	108+	45+	.10	2.13	77	1.92	77	.0	.0
SEP	88.3	56.8	72.6	111+	42	.36	3.59	76	1.43	63	.0	.0
OCT	80.0	51.1	65.6	104+	32+	.44	3.93	57	2.02	79	.0	.0
NOV	70.4	45.3	57.9	93#	30+	1.96	10.46	65	3.35	70	.0	.0
DEC	64.8	41.1	53.0	88+	23+	2.69	12.67	66	4.61	66	.0	.0
YEAR	76.2	48.4	62.3	111	23	19.89	19.64	JAN 69	6.38	JAN 69	.0	.0

* FROM 1951 - 80 NORMALS # ESTIMATED VALUE BASED ON DATA FROM SURROUNDING STATIONS + ALSO ON EARLIER DATES

PROBABILITY THAT THE MONTHLY PRECIPITATION WILL BE EQUAL TO OR LESS THAN THE INDICATED PRECIPITATION AMOUNT
MONTHLY PRECIPITATION (INCHES) **

	PROBABILITY LEVELS										
	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
JAN	.00	.43	1.25	2.01	2.80	3.68	4.71	5.95	7.67	10.51	13.27
FEB	.04	.12	.38	.77	1.30	2.01	2.95	4.25	6.21	9.76	13.47
MAR	.00	.00	.84	1.43	2.02	2.66	3.40	4.31	5.50	7.48	9.40
APR	.01	.07	.24	.45	.71	1.04	1.46	2.01	2.81	4.22	5.65
MAY	.00	.00	.02	.09	.18	.29	.45	.66	.96	1.50	2.06
JUN	.00	.00	.00	.00	.00	.02	.04	.07	.11	.19	.26
JUL	.00	.00	.00	.00	.00	.00	.00	.00	.00	.11	.35
AUG	.00	.00	.00	.00	.00	.00	.00	.00	.00	.14	.62
SEP	.00	.00	.00	.00	.00	.00	.00	.08	.42	1.23	2.15
OCT	.00	.00	.00	.00	.03	.13	.27	.47	.77	1.33	1.90
NOV	.01	.06	.23	.46	.75	1.13	1.62	2.27	3.24	4.95	6.70
DEC	.00	.04	.28	.61	1.03	1.57	2.25	3.16	4.49	6.84	9.24

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PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

CLIMATOLOGICAL SUMMARY
FOR
UPLAND, CALIFORNIA

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 4-04c

CLIMATOLOGICAL SUMMARY FOR BEAUMONT, CALIFORNIA

PERIOD: 1951-80
ELEVATION: 2605 FT

	TEMPERATURE (F)					PRECIPITATION TOTALS (INCHES)								PROBABILITY THAT THE MONTHLY PRECIPITATION WILL BE EQUAL TO OR LESS THAN THE INDICATED PRECIPITATION AMOUNT MONTHLY PRECIPITATION (INCHES) **										
	MEANS			EXTREMES							SNOW			PROBABILITY LEVELS									
	DAILY MAXIMUM*	DAILY MINIMUM*	MONTHLY*	RECORD HIGHEST	RECORD LOWEST	MEAN*	GREATEST MONTHLY*	YEAR	GREATEST DAILY	YEAR	MEAN	MAXIMUM MONTHLY	YEAR	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
JAN	59.5	38.1	48.9	83+	18	3.56	11.52	69	4.69	69	.9	15.8	79	.00	.24	.79	1.34	1.93	2.60	3.40	4.39	5.77	8.08	10.35
FEB	62.9	38.4	50.7	84+	20+	3.07	13.20	80	3.50	69	.2	4.0	53	.04	.20	.55	.97	1.45	2.04	2.76	3.69	5.02	7.30	9.59
MAR	64.9	39.1	52.0	90+	21+	2.90	8.92	78	2.58	78	.3	5.5	53	.00	.16	.58	1.01	1.49	2.05	2.72	3.56	4.74	6.72	8.69
APR	70.6	41.5	56.1	94+	25	1.51	6.53	65	2.21	58	.0	.0		.00	.00	.15	.39	.66	.98	1.36	1.86	2.56	3.73	4.91
MAY	77.3	46.7	62.0	101	32+	.63	4.14	77	1.91	77	.0	.0		.00	.00	.01	.09	.19	.32	.50	.73	1.07	1.68	2.30
JUN	86.8	51.9	69.4	108	35+	.11	.75	72	.37	72	.0	.0		.00	.00	.00	.00	.01	.03	.07	.12	.20	.33	.46
JUL	95.7	58.5	77.1	111+	42+	.16	1.14	68	.61	69	.0	.0		.00	.00	.00	.00	.00	.01	.07	.16	.29	.53	.77
AUG	94.6	58.5	76.6	108+	38+	.15	2.24	77	1.85	77	.0	.0		.00	.00	.00	.00	.00	.00	.00	.06	.20	.51	.85
SEP	89.9	55.2	72.6	110+	37+	.44	4.60	76	2.48	76	.0	.0		.00	.00	.00	.00	.00	.05	.17	.37	.72	1.40	2.14
OCT	80.2	49.3	64.8	106+	29+	.52	3.18	57	1.71	79	.0	.0		.00	.00	.00	.02	.08	.18	.33	.55	.88	1.50	2.16
NOV	68.4	42.8	55.6	91+	20+	1.75	9.02	65	2.85	65	.0	.0		.00	.00	.27	.55	.85	1.20	1.62	1.16	2.90	4.15	5.40
DEC	61.4	39.3	50.4	83+	20+	2.20	10.88	66	4.19	66	.1	1.0	67	.01	.08	.28	.54	.87	1.30	1.84	2.57	3.63	5.51	7.43
YEAR	76.0	46.6	61.4	111	18	17.00	13.20	FEB 80	4.69	JAN 69	1.5	15.8	JAN 79											

* FROM 1951 - 80 NORMALS # ESTIMATED VALUE BASED ON DATA FROM SURROUNDING STATIONS + ALSO ON EARLIER DATES

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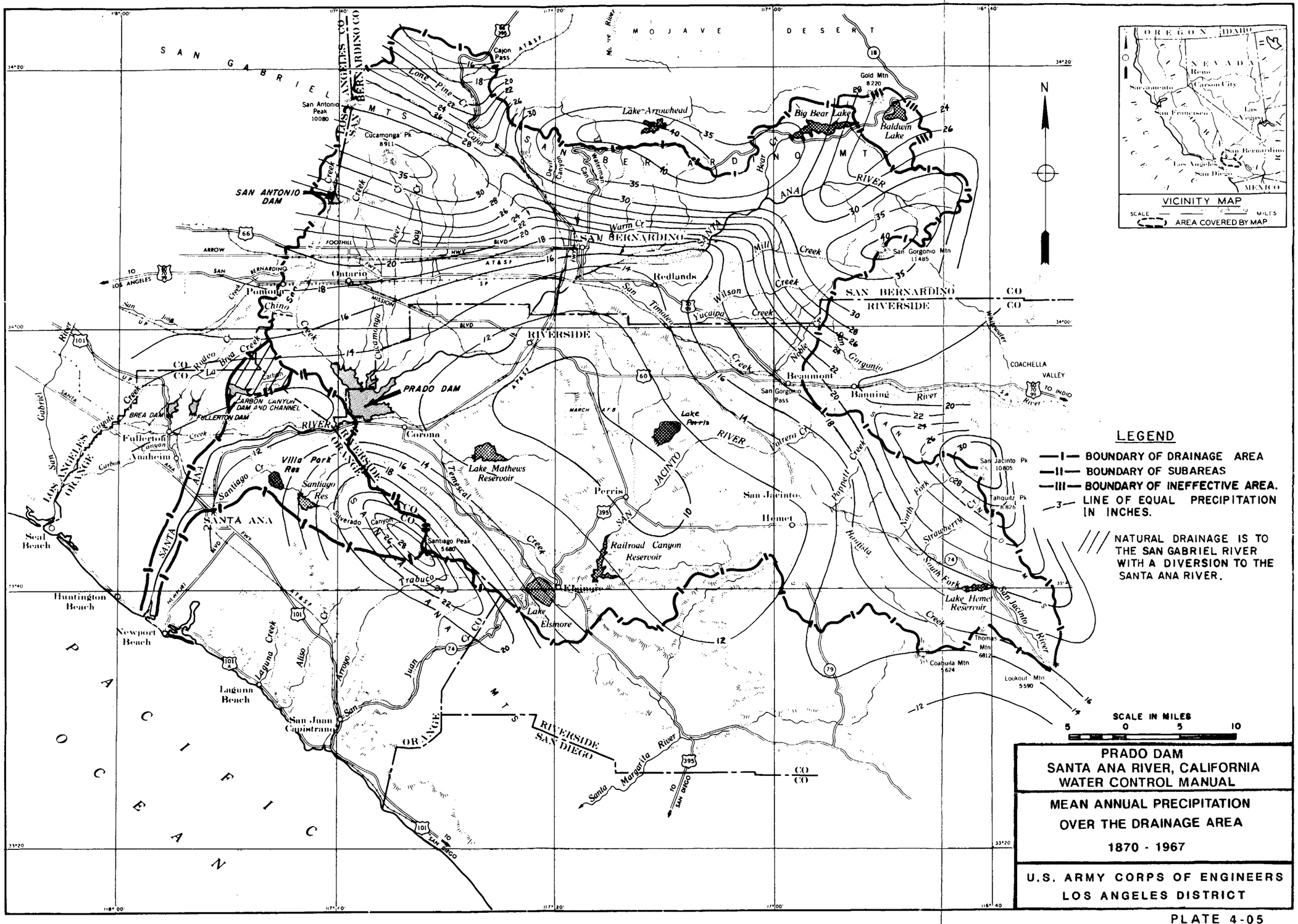
PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

CLIMATOLOGICAL SUMMARY
FOR
BEAUMONT, CALIFORNIA

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 4-04d



PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

MEAN ANNUAL PRECIPITATION OVER THE DRAINAGE AREA 1870 - 1967

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 4-05

MAXIMUM PRECIPITATION FOR INDICATED DURATION***

RETURN PERIOD IN YEARS	5M	10M	15M	30M	1H	2H	3H	6H	12H	24H	C-YR	STATION
2	.12	.18	.23	.33	.43	.60	.75	1.11	1.56	2.07	15.63	NAME:
5	.18	.27	.35	.51	.65	.91	1.13	1.68	2.37	3.14	21.99	BEAUMONT
10	.22	.33	.43	.63	.81	1.12	1.40	2.07	2.91	3.87	25.94	
20	.26	.39	.51	.74	.95	1.32	1.65	2.44	3.44	4.56	29.54	ELEVATION:
25	.27	.41	.53	.77	.99	1.38	1.72	2.56	3.60	4.78	30.65	2610 FT
40	.30	.45	.58	.85	1.09	1.52	1.89	2.80	3.94	5.23	32.92	
50	.31	.47	.60	.88	1.13	1.58	1.96	2.91	4.10	5.44	33.97	LAT/LONG**
100	.35	.52	.68	.99	1.27	1.77	2.20	3.26	4.59	6.09	37.16	33.933/116.967
200	.38	.58	.75	1.09	1.40	1.95	2.43	3.60	5.07	6.73	40.23	
2	.14	.21	.27	.40	.63	1.01	1.37	2.18	3.22	4.35	32.42	NAME:
5	.21	.32	.42	.60	.96	1.56	2.08	3.30	4.88	6.60	45.60	BIG BEAR LAKE
10	.26	.40	.51	.74	1.18	1.89	2.56	4.07	6.01	8.1	53.79	DAM
20	.31	.47	.60	.88	1.39	2.23	3.02	4.79	7.08	8.58	61.25	
25	.33	.49	.63	.92	1.46	2.34	3.16	5.02	7.42	9.04	63.55	ELEVATION:
40	.36	.54	.69	1.01	1.59	2.56	3.46	5.50	8.13	10.99	68.26	6815 FT
50	.37	.56	.72	1.05	1.66	2.66	3.61	5.72	8.46	11.44	70.45	
100	.42	.62	.81	1.17	1.86	2.98	4.04	6.41	9.47	12.80	77.05	LAT/LONG**
200	.46	.69	.89	1.29	2.05	3.29	4.46	7.08	10.46	14.15	83.42	34.233/116.967
2	.13	.18	.24	.32	.44	.67	.84	1.22	1.62	2.09	11.93	NAME:
5	.19	.27	.35	.47	.65	1.00	1.24	1.80	2.38	3.09	16.80	PRADO DAM
10	.23	.32	.43	.57	.78	1.21	1.50	2.18	2.89	3.74	19.88	
20	.27	.37	.50	.67	.91	1.40	1.74	2.54	3.36	4.35	22.72	ELEVATION:
25	.28	.39	.52	.70	.95	1.46	1.82	2.65	3.51	4.54	23.59	560 FT
40	.30	.42	.56	.76	1.03	1.59	1.98	2.88	3.81	4.94	25.39	
50	.31	.44	.58	.79	1.07	1.65	2.05	2.99	3.95	5.12	26.23	LAT/LONG**
100	.35	.49	.65	.87	1.19	1.83	2.27	3.32	4.38	5.68	28.77	33.890/117.635
200	.38	.54	.71	.96	1.30	2.01	2.49	3.64	4.81	6.23	31.23	
2	0.00	0.00	0.00	0.00	.34	.48	.57	.78	1.01	1.26	9.52	NAME:
5	0.00	0.00	0.00	0.00	.51	.73	.87	1.19	1.53	1.91	13.38	RIVERSIDE
10	0.00	0.00	0.00	0.00	.63	.90	1.07	1.47	1.89	2.35	15.79	CITRUS EXP STA
20	0.00	0.00	0.00	0.00	.74	1.06	1.27	1.73	2.23	2.77	17.98	
25	0.00	0.00	0.00	0.00	.78	1.11	1.33	1.87	2.33	2.90	18.6	ELEVATION:
40	0.00	0.00	0.00	0.00	.85	1.21	1.45	1.98	2.56	3.17	20.04	1015 FT
50	0.00	0.00	0.00	0.00	.88	1.26	1.51	2.06	2.66	3.30	20.68	
100	0.00	0.00	0.00	0.00	.99	1.41	1.69	2.31	2.98	3.70	22.62	LAT/LONG**
200	0.00	0.00	0.00	0.00	1.09	1.56	1.87	2.55	3.29	4.09	24.49	33.967/117.334
2	0.00	0.00	.25	.35	.5	.77	0.00	1.45	1.98	2.69	*16.91	NAME:
5	0.00	0.00	.38	.54	.77	1.17	0.00	2.20	3.01	4.08	*23.78	UPLAND
10	0.00	0.00	.46	.66	.95	1.44	0.00	2.71	3.71	5.02	*28.05	
20	0.00	0.00	.55	.78	1.12	1.69	0.00	3.19	4.37	5.92	*31.94	ELEVATION:
25	0.00	0.00	.57	.82	1.17	1.77	0.00	3.35	4.58	6.21	*33.14	1840 FT
40	0.00	0.00	.63	.89	1.29	1.94	0.00	3.66	5.01	6.79	*35.60	
50	0.00	0.00	.65	.93	1.34	2.02	0.00	3.81	5.22	7.07	*36.74	LAT/LONG**
100	0.00	0.00	.73	1.04	1.50	2.26	0.00	4.27	5.84	7.92	*40.18	34.140/117.677
200	0.00	0.00	.81	1.15	1.66	2.50	0.00	4.72	6.46	8.75	*43.50	

* THE DURATION IS FOR FISCAL-YEAR (JULY TO JUNE)

** LATITUDE/LONGITUDE

*** M: MINUTES
H: HOURS
C-YR: CALENDER YEAR

PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

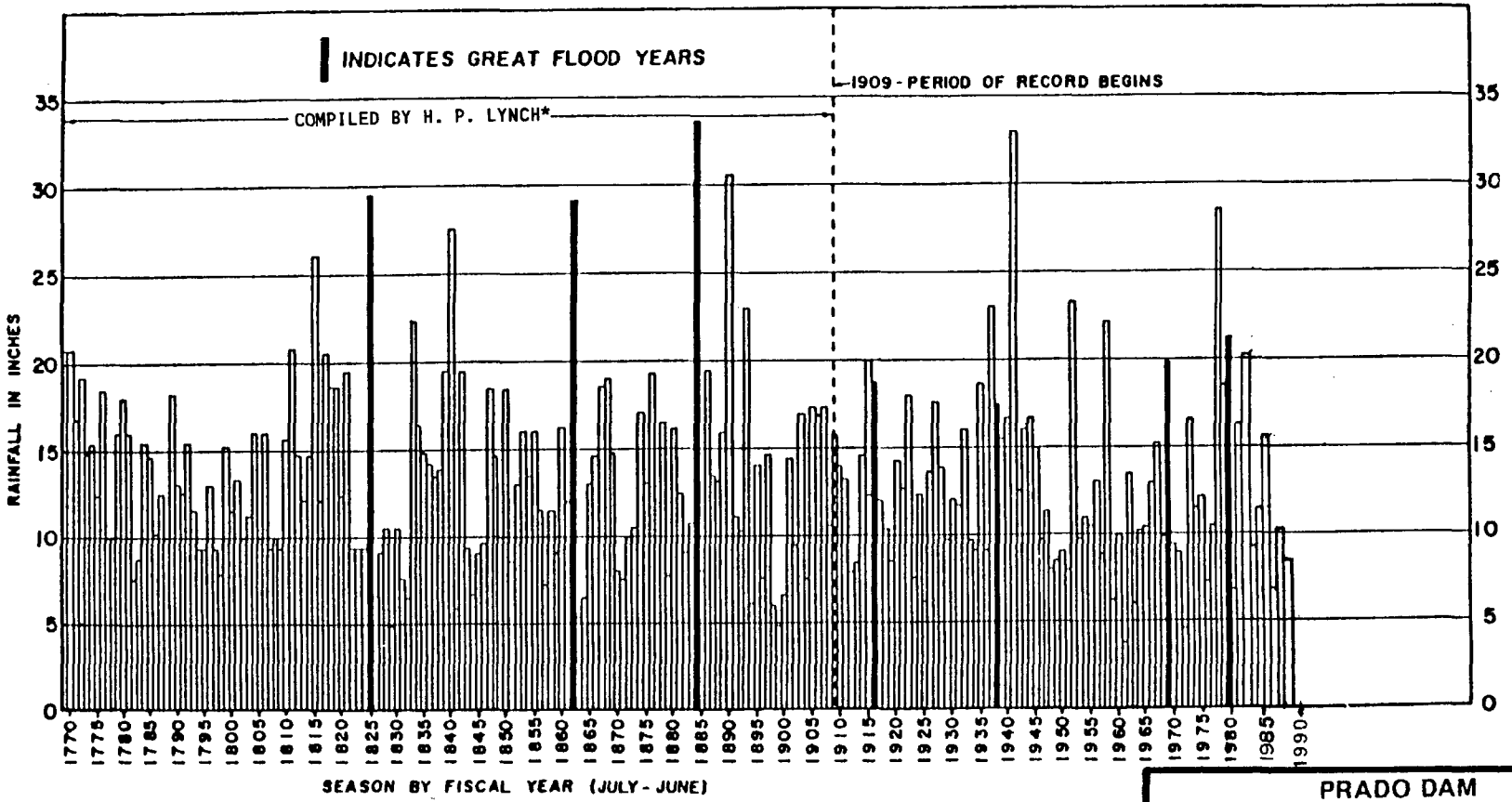
PRECIPITATION

DEPTH - DURATION - FREQUENCY

TABLE

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

FLOOD YEARS AND YEARLY RAINFALL AT SANTA ANA SINCE 1769



* Lynch, H. P., "Rainfall and Stream Run-Off in Southern California," Metropolitan Water District of Southern California, Los Angeles, California, August, 1931

Note: Solid black lines indicate major flood years.

PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

HISTORICAL RAINFALL

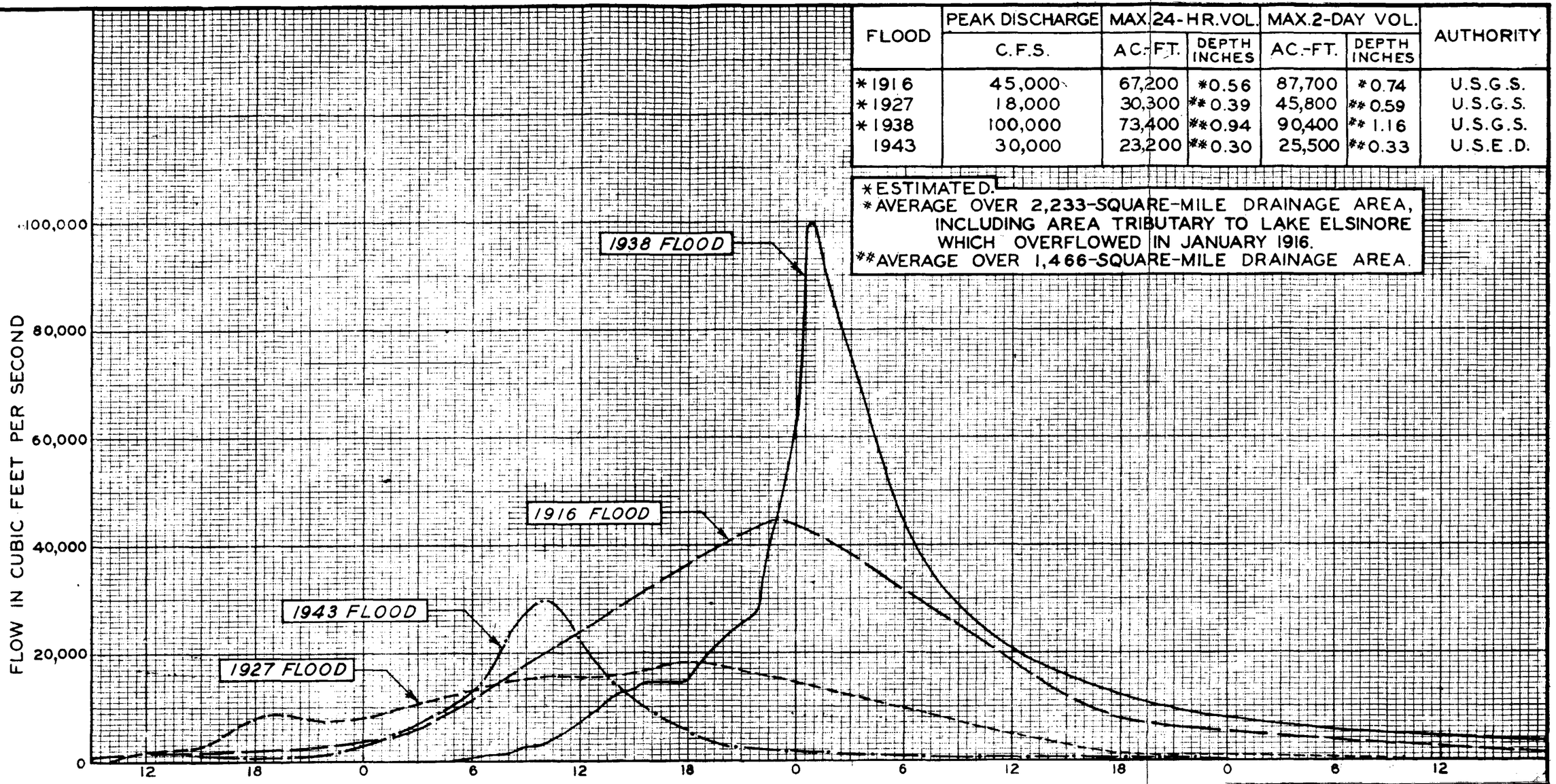
AT SANTA ANA

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 4-07

FLOOD	PEAK DISCHARGE	MAX. 24-HR. VOL.		MAX. 2-DAY VOL.		AUTHORITY
	C.F.S.	AC.-FT.	DEPTH INCHES	AC.-FT.	DEPTH INCHES	
*1916	45,000	67,200	*0.56	87,700	*0.74	U.S.G.S.
*1927	18,000	30,300	**0.39	45,800	**0.59	U.S.G.S.
*1938	100,000	73,400	**0.94	90,400	**1.16	U.S.G.S.
1943	30,000	23,200	**0.30	25,500	**0.33	U.S.E.D.

*ESTIMATED.
*AVERAGE OVER 2,233-SQUARE-MILE DRAINAGE AREA, INCLUDING AREA TRIBUTARY TO LAKE ELSINORE WHICH OVERFLOWED IN JANUARY 1916.
**AVERAGE OVER 1,466-SQUARE-MILE DRAINAGE AREA.

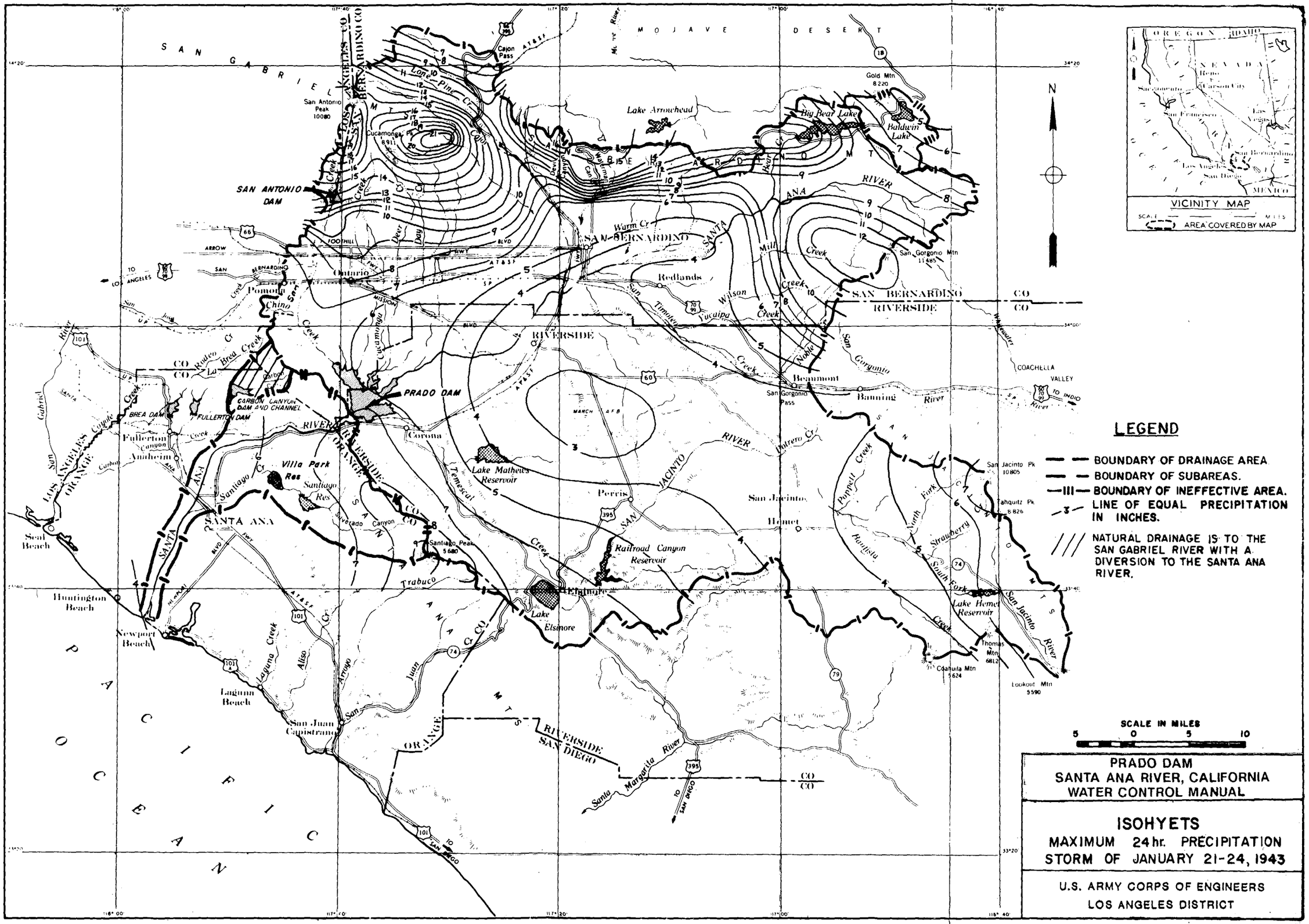


PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

HYDROGRAPHS OF MAJOR FLOODS
ON THE SANTA ANA RIVER
AT PRADO DAM

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 4-08



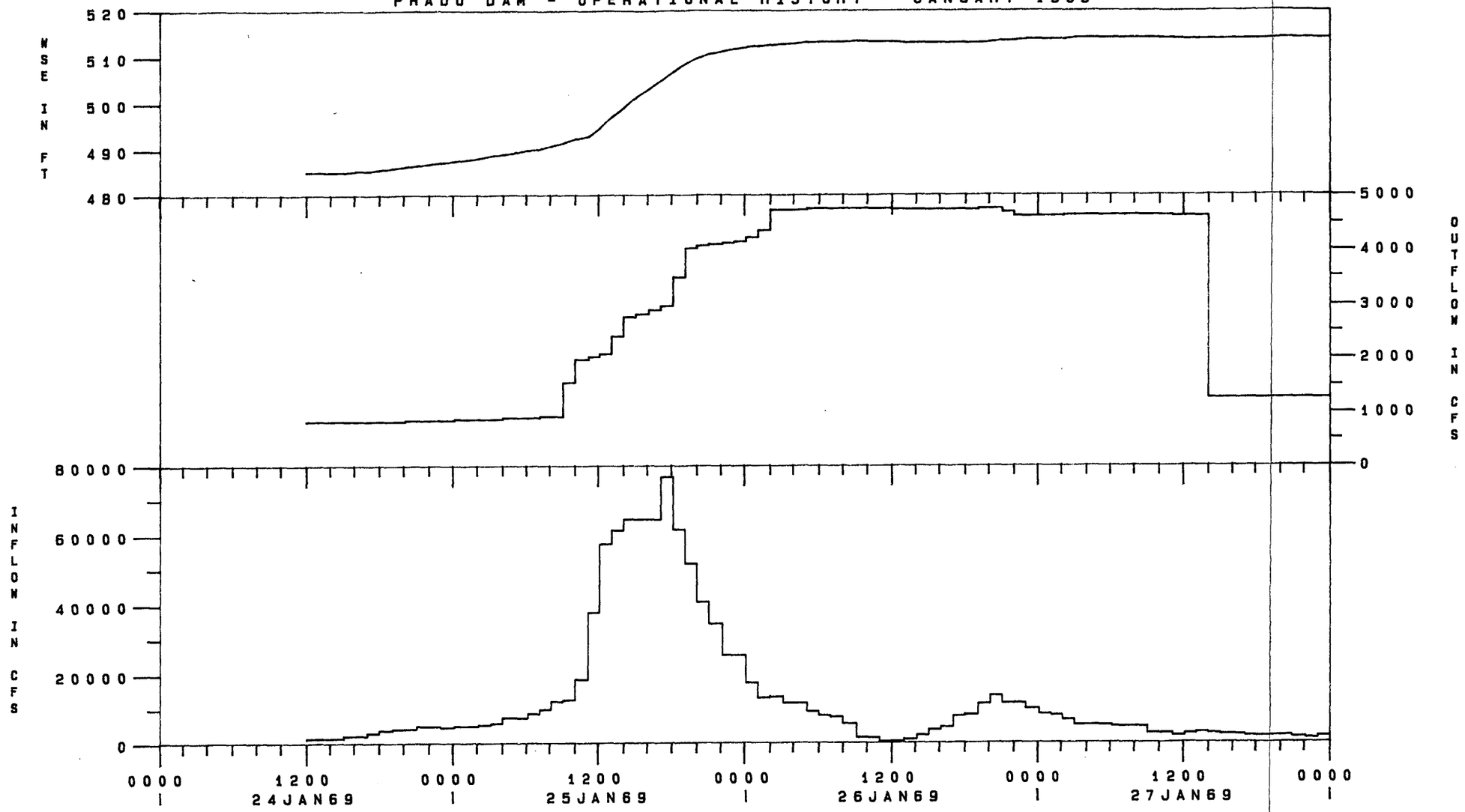
PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

ISOHYETS
MAXIMUM 24 hr. PRECIPITATION
STORM OF JANUARY 21-24, 1943

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

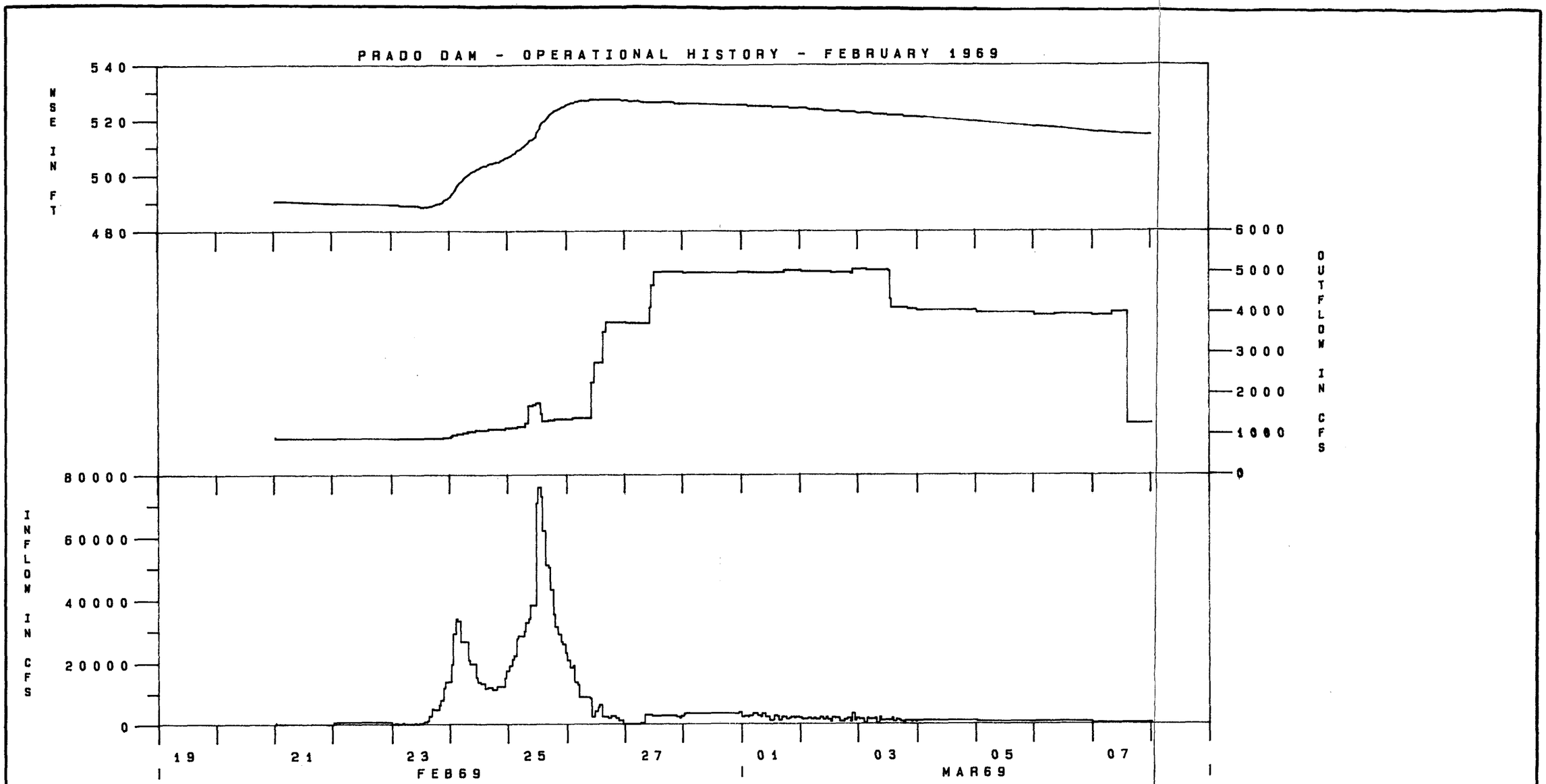
PLATE 4-09

PRADO DAM - OPERATIONAL HISTORY - JANUARY 1969



PRADO DAM SANTA ANA RIVER, CALIFORNIA WATER CONTROL MANUAL
OPERATION HYDROGRAPHS JANUARY 1969
U. S. ARMY CORPS OF ENGINEERS LOS ANGELES DISTRICT

PLATE 4-10



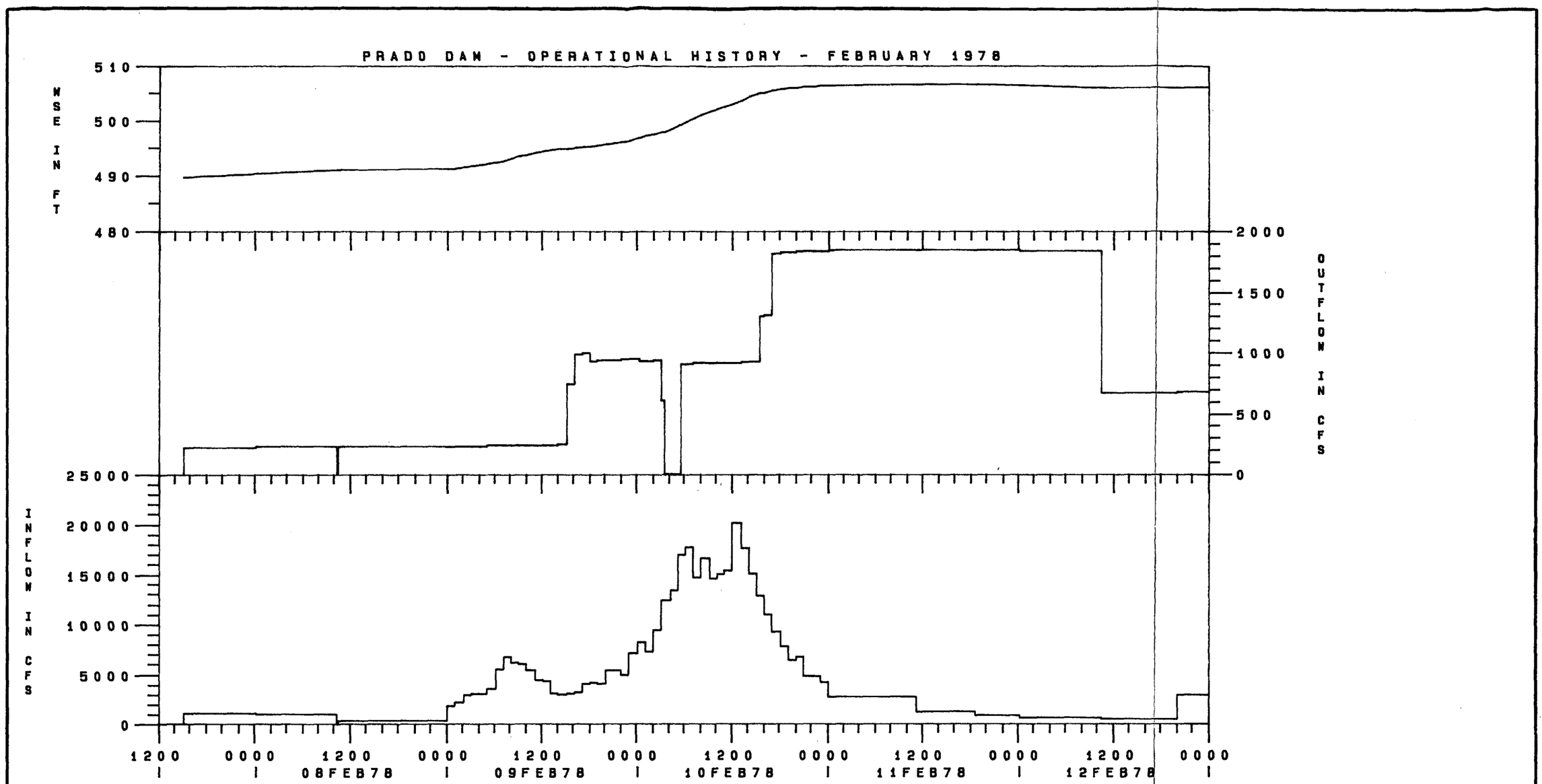
PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

OPERATION HYDROGRAPHS

FEBRUARY 1969

U. S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

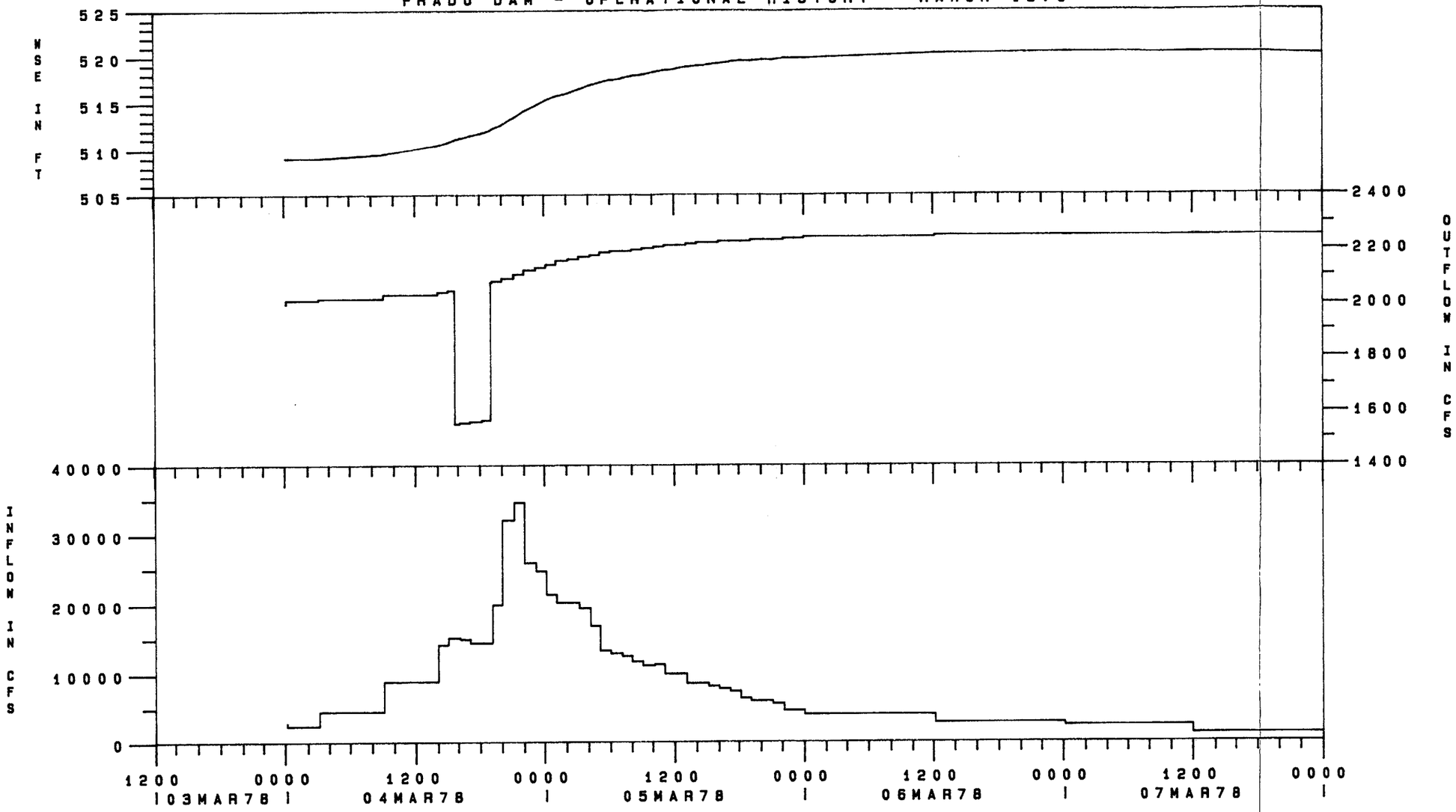
PLATE 4-11



PRADO DAM SANTA ANA RIVER, CALIFORNIA WATER CONTROL MANUAL
OPERATION HYDROGRAPHS FEBRUARY 1978
U. S. ARMY CORPS OF ENGINEERS LOS ANGELES DISTRICT

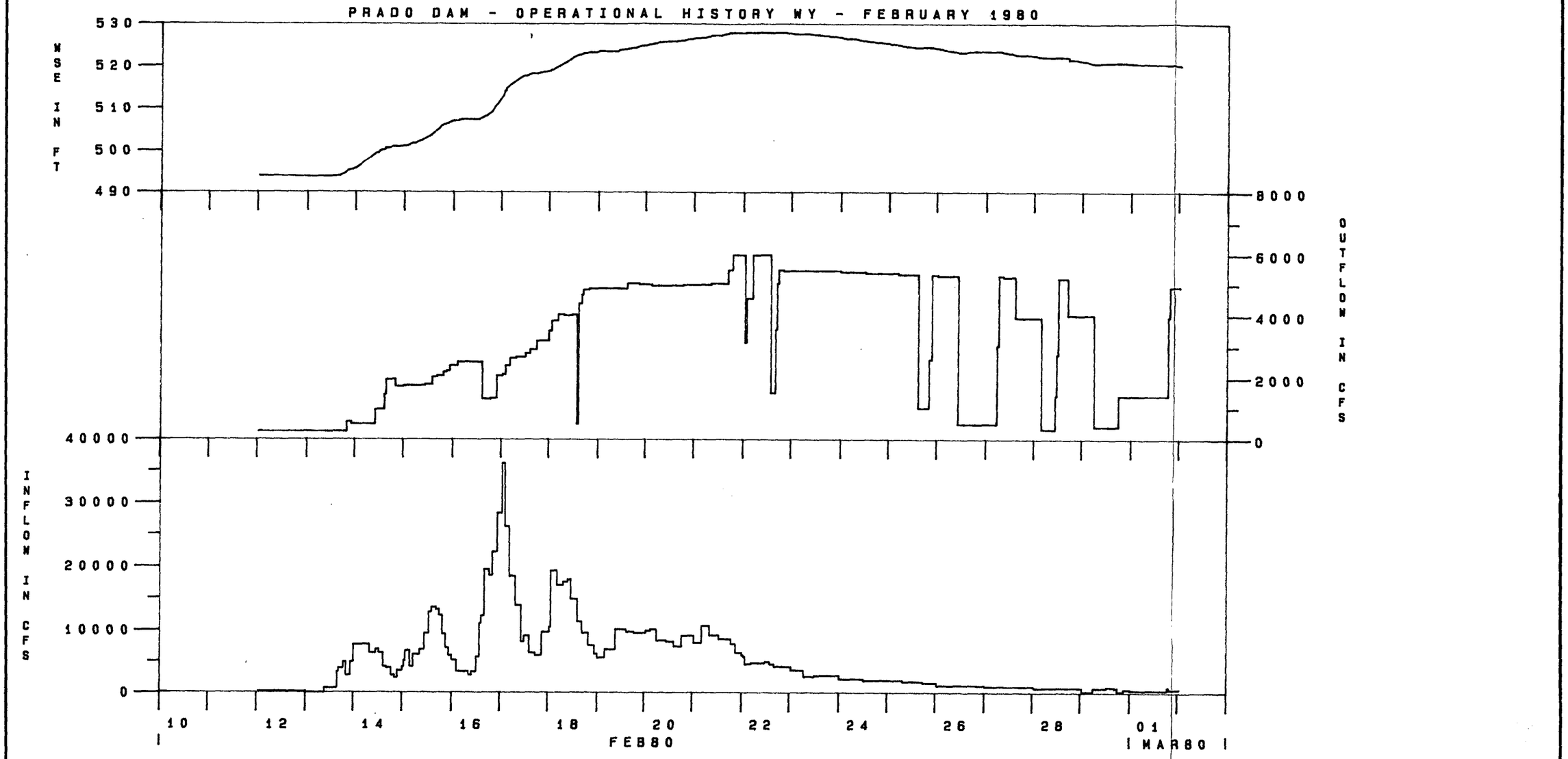
PLATE 4-12

PRADO DAM - OPERATIONAL HISTORY - MARCH 1978



PRADO DAM SANTA ANA RIVER, CALIFORNIA WATER CONTROL MANUAL
OPERATION HYDROGRAPHS MARCH 1978
U. S. ARMY CORPS OF ENGINEERS LOS ANGELES DISTRICT

PLATE 4-13



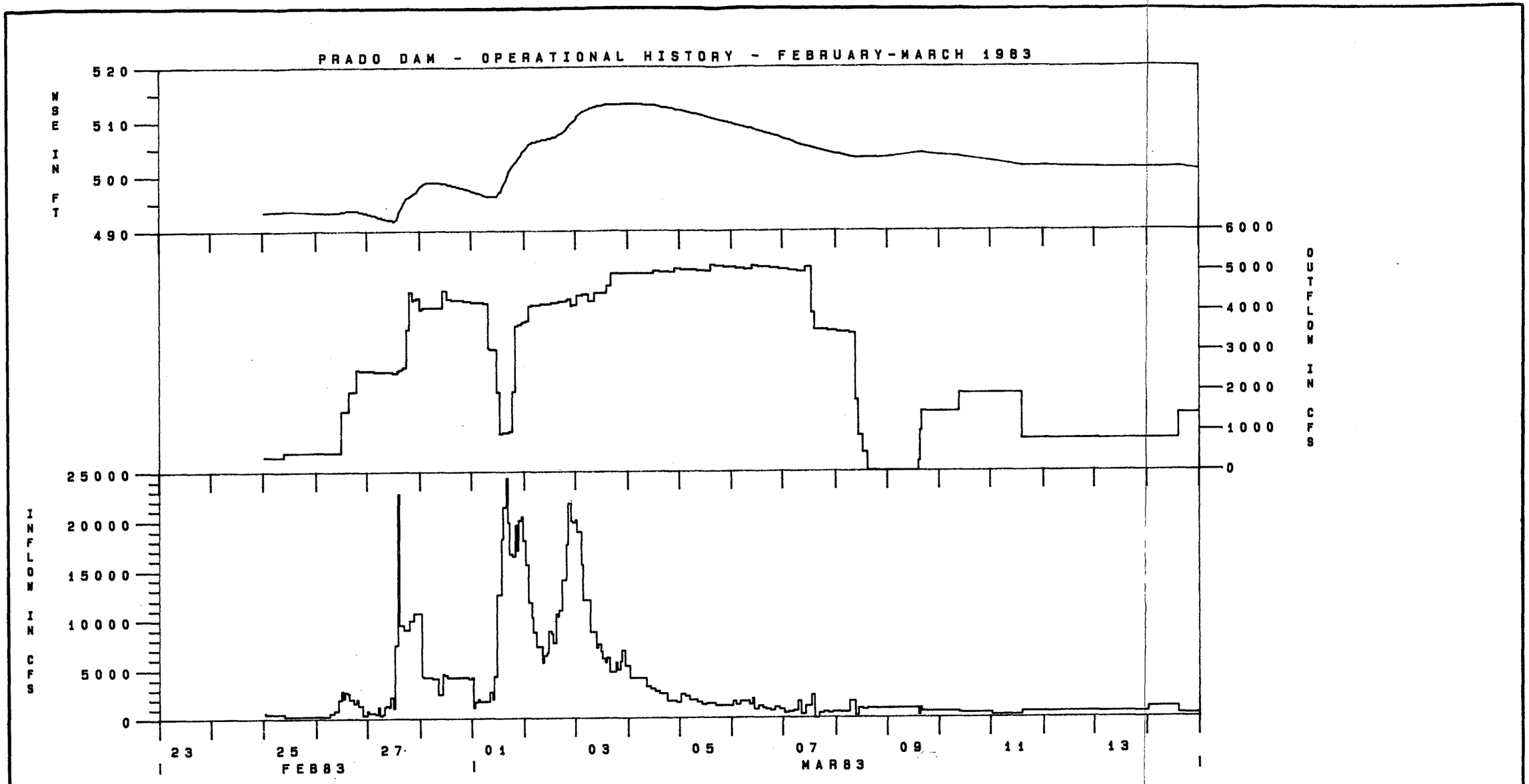
PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

OPERATION HYDROGRAPHS

FEBRUARY 1980

U. S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 4-14



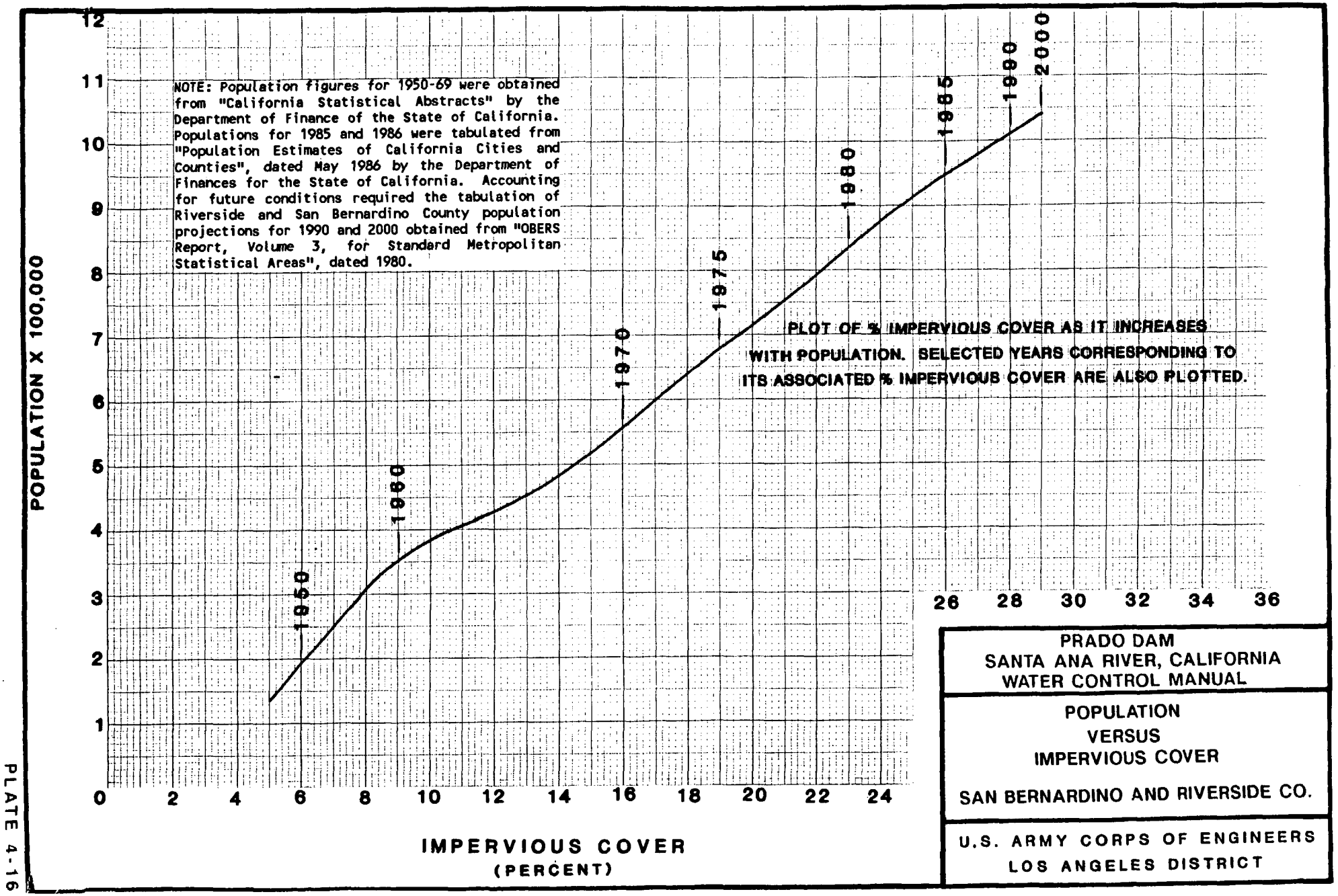
PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

OPERATION HYDROGRAHS

MARCH 1983

U. S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 4-15



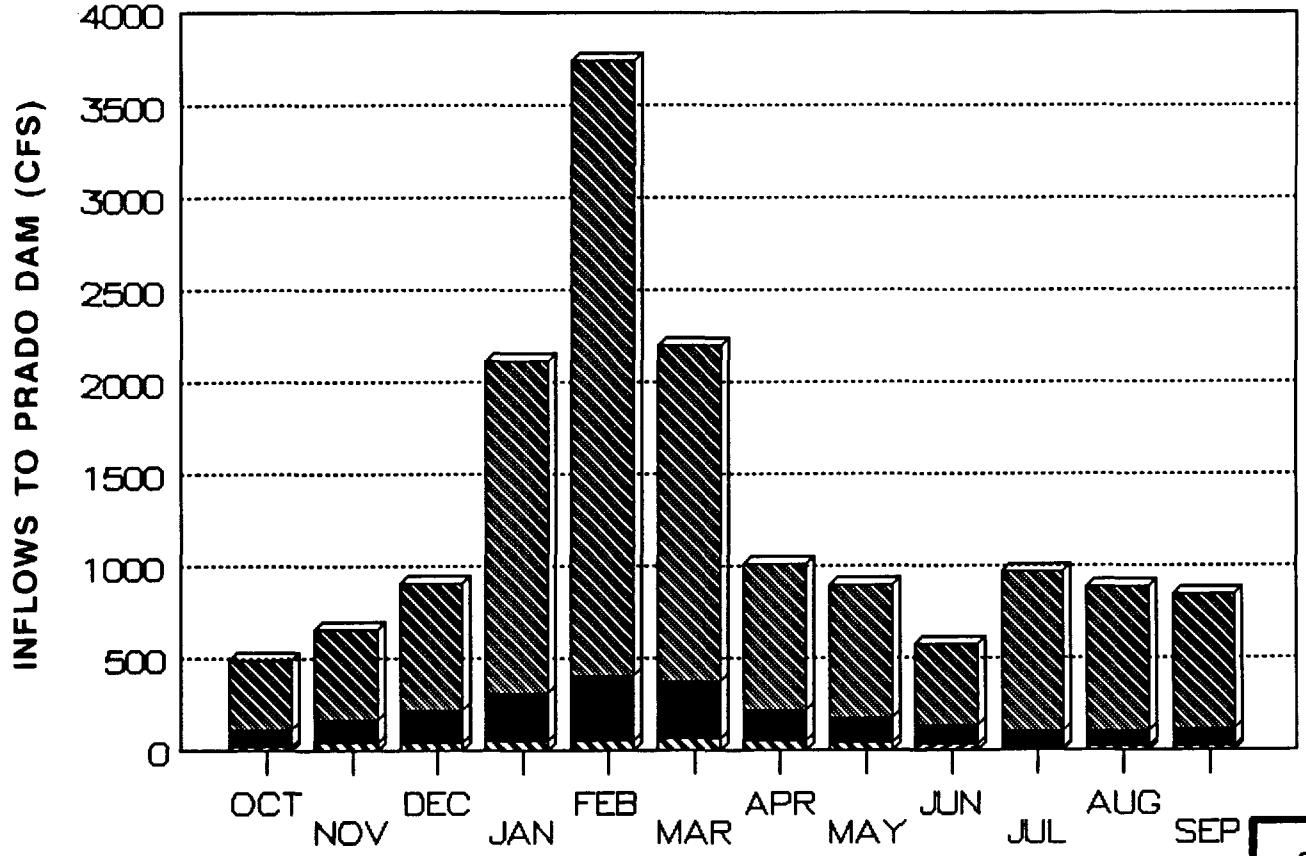
PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

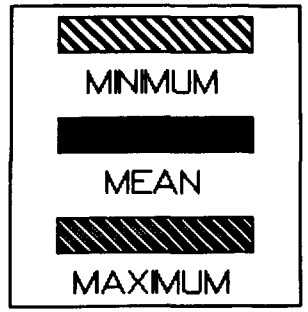
POPULATION
VERSUS
IMPERVIOUS COVER

SAN BERNARDINO AND RIVERSIDE CO.

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 4-16





NOTE:

DATA FROM OFFICIAL RECORDS OF THE CORPS OF ENGINEERS' RESERVOIR REGULATION SECTION

PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

MONTHLY

MAXIMUM, MINIMUM, AND MEAN

INFLOWS TO PRADO DAM

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 4-17

MONTHLY AND ANNUAL MEAN VALUES, FLOW, CFS*

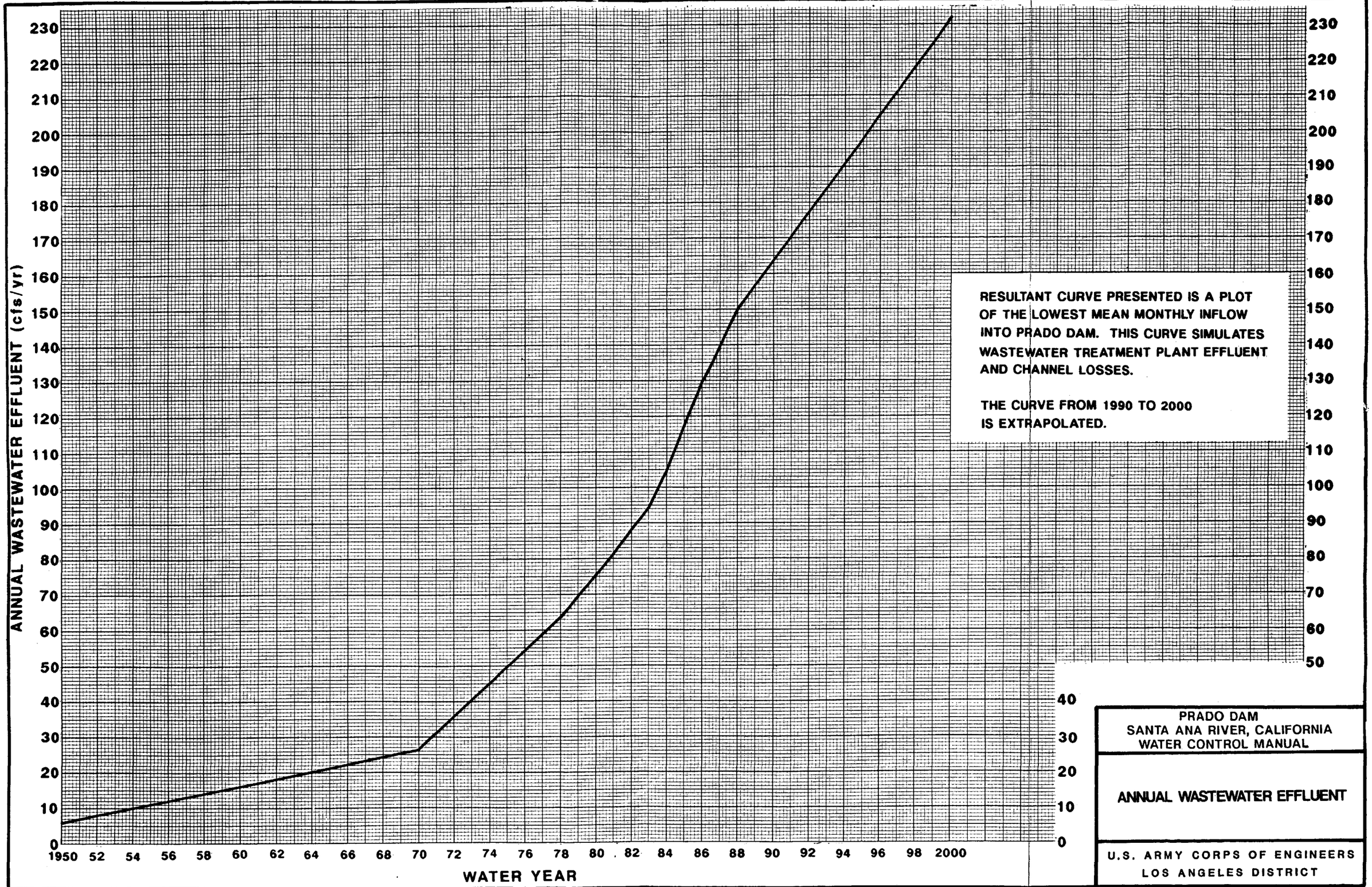
YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANNUAL
1941	61	80	224	135	391	857	590	292	87	61	56	65	241
1942	90	103	164	179	144	149	143	86	72	54	50	60	108
1943	72	87	108	562	349	636	257	93	67	57	53	59	200
1944	94	94	197	169	473	281	143	109	83	67	55	64	151
1945	80	153	155	163	325	325	165	85	76	60	60	61	141
1947	70	229	240	218	169	124	85	77	65	46	45	54	118
1948	66	82	109	98	132	110	111	68	67	49	43	45	81
1949	60	72	92	116	120	132	74	65	49	42	68	72	80
1950	90	101	124	110	125	92	106	132	117	87	82	72	103
1951	55	70	72	84	86	109	138	131	113	117	106	85	97
1952	134	143	240	442	161	313	151	87	111	114	99	106	176
1953	114	111	109	104	126	174	85	55	46	70	113	119	102
1954	122	142	77	185	143	160	154	203	205	199	196	123	159
1955	136	70	178	182	159	212	72	188	135	120	111	36	134
1956	45	57	103	273	87	71	68	98	93	42	44	171	96
1957	108	43	46	107	81	91	71	63	47	33	25	29	62
1958	44	56	97	83	236	202	333	69	49	40	34	34	105
1959	62	46	55	88	95	63	55	45	41	29	22	26	52
1960	33	39	56	78	149	70	53	45	34	18	15	16	50
1961	20	60	69	76	73	54	43	35	23	20	22	23	43
1962	22	35	63	77	203	74	53	43	35	22	19	19	54
1963	23	33	40	49	98	74	66	46	35	21	21	55	46
1964	39	74	48	71	51	69	55	42	34	22	20	24	46
1965	42	74	48	71	50	58	153	50	39	29	23	26	55
1966	24	437	300	94	114	62	49	43	35	29	19	20	102
1967	33	47	681	185	67	73	101	55	43	26	24	31	115
1968	33	105	102	71	73	185	73	47	42	29	23	24	67
1969	34	56	78	1807	3108	519	398	576	113	3	53	53	550
1970	51	89	90	94	112	170	65	67	46	39	28	26	73
1971	39	139	166	116	136	79	67	61	51	25	23	23	77
1972	50	65	217	103	88	78	66	57	55	32	35	33	73
1973	49	114	146	205	369	198	102	85	106	68	51	52	127
1974	80	107	224	355	290	189	170	200	228	275	273	177	214
1975	200	172	207	144	127	185	147	103	146	203	170	141	162
1976	88	232	335	345	293	294	145	144	290	193	117	172	220
1977	142	120	128	304	181	156	118	147	90	74	95	75	136
1978	74	81	166	455	963	1768	296	143	91	66	70	121	355
1979	218	168	169	363	347	481	281	148	97	80	109	101	213
1980	113	147	235	893	3335	1403	724	550	261	119	82	93	652
1981	107	160	276	225	210	268	123	239	216	105	75	77	173
1982	129	156	150	310	245	565	332	169	140	121	99	125	212
1983	126	293	389	611	733	1883	790	722	443	870	777	732	699
1984	377	486	519	357	288	239	201	169	168	157	148	148	272
1985	166	203	528	329	336	296	230	210	173	149	160	157	245
1986	171	341	208	304	550	542	259	159	168	150	144	167	262
1987	184	208	231	328	282	304	187	193	150	152	133	134	207

* Data from official records of the Corps of Engineers' Reservoir Regulation Section.

PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

MONTHLY FLOWS
FOR
PERIOD OF RECORD

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT



PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

ANNUAL WASTEWATER EFFLUENT

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 4-19

MAXIMUM PEAK INFLOWS, OUTFLOWS AND WATER SURFACE ELEVATIONS FOR PERIOD OF RECORD*

WATER YEAR**	DATE	WATER SURFACE ELEVATION (FEET)	DATE	AVERAGE INFLOW (CFS)	DATE	AVERAGE OUTFLOW (CFS)
1941	06 MAR	484.72	05 MAR	3,180.0	16 MAR	1,650.0
1942	11 DEC	469.42	11 DEC	896.0	11 DEC	535.0
1943	24 JAN	494.95	23 JAN	29,630.0	24 JAN	1,880.0
1944	23 FEB	486.35	22 FEB	8,540.0	23 FEB	1,580.0
1945	03 FEB	479.48	03 FEB	4,740.0	03 FEB	1,400.0
1946	15 NOV	477.33	01 OCT	59.0	01 OCT	59.0
1947	14 NOV	477.34	14 NOV	2,033.0	15 NOV	645.0
1948	07 FEB	469.27	07 FEB	470.0	07 FEB	460.0
1949	13 JAN	468.83	13 JAN	563.0	13 JAN	255.0
1950	07 FEB	471.11	06 FEB	814.0	07 FEB	420.0
1951	15 MAY	464.88	01 MAY	170.0	01 MAY	170.0
1952	19 JAN	487.94	16 JAN	7,806.0	19 JAN	921.0
1953	20 DEC	470.19	20 DEC	1,449.0	21 DEC	355.0
1954	25 JAN	478.66	25 JAN	4,957.0	14 FEB	956.0
1955	19 JAN	473.20	19 JAN	3,516.0	19 JAN	835.0
1956	27 JAN	485.37	26 JAN	5,678.0	26 JAN	938.0
1957	14 JAN	472.83	13 JAN	2,294.0	13 JAN	748.0
1958	04 APR	485.99	04 APR	3,770.0	04 FEB	1,073.0
1959	06 JAN	471.24	06 JAN	867.0	06 JAN	552.0
1960	02 FEB	468.50	02 FEB	543.0	02 FEB	473.0
1961	26 JAN	463.91	26 JAN	163.0	26 JAN	161.0
1962	21 FEB	475.14	08 FEB	1,179.0	08 FEB	748.0
1963	11 FEB	476.32	10 FEB	1,158.0	11 FEB	608.0
1964	21 NOV	472.50	23 MAR	401.0	22 NOV	377.0
1965	10 APR	475.85	10 APR	1,485.0	10 APR	596.0
1966	23 NOV	493.58	23 NOV	30,650.0	30 NOV	1,040.0
1967	07 DEC	501.72	07 DEC	29,539.0	07 DEC	1,072.0
1968	08 MAR	485.97	08 MAR	13,630.0	22 NOV	995.0
1969	26 FEB	527.63	25 JAN	76,918.0	02 MAR	5,069.0
1970	06 MAR	490.37	01 MAR	2,503.0	21 JUL	198.0
1971	23 DEC	488.88	30 NOV	11,476.0	29 NOV	377.0
1972	28 DEC	491.40	25 DEC	5,198.0	27 DEC	540.0
1973	24 MAR	494.77	11 FEB	5,282.0	27 MAR	482.0
1974	08 JAN	489.62	08 JAN	5,438.0	08 JAN	2,000.0
1975	12 MAR	486.01	04 DEC	1,871.0	05 DEC	790.0
1976	11 FEB	486.63	12 SEP	2,072.0	11 SEP	553.0
1977	08 JAN	486.03	07 JAN	1,278.0	12 JAN	416.0
1978	07 MAR	520.45	04 MAR	34,705.0	07 MAR	2,250.0
1979	24 APR	504.60	06 JAN	6,095.0	07 JAN	510.0
1980	22 FEB	528.00	17 FEB	36,162.0	22 FEB	5,992.0
1981	23 MAR	496.63	30 JAN	4,245.0	14 OCT	990.0
1982	15 APR	501.35	18 MAR	11,023.0	02 APR	3,030.0
1983	04 MAR	513.17	01 MAR	24,392.0	05 MAR	5,140.0
1984	27 DEC	499.33	01 OCT	5,517.0	12 NOV	2,702.0
1985	20 DEC	490.59	19 DEC	6,171.0	20 DEC	2,040.0
1986	16 FEB	495.13	15 FEB	7,799.0	17 MAR	2,130.0
1987	25 MAR	492.88	04 JAN	4,705.0	06 JAN	814.0

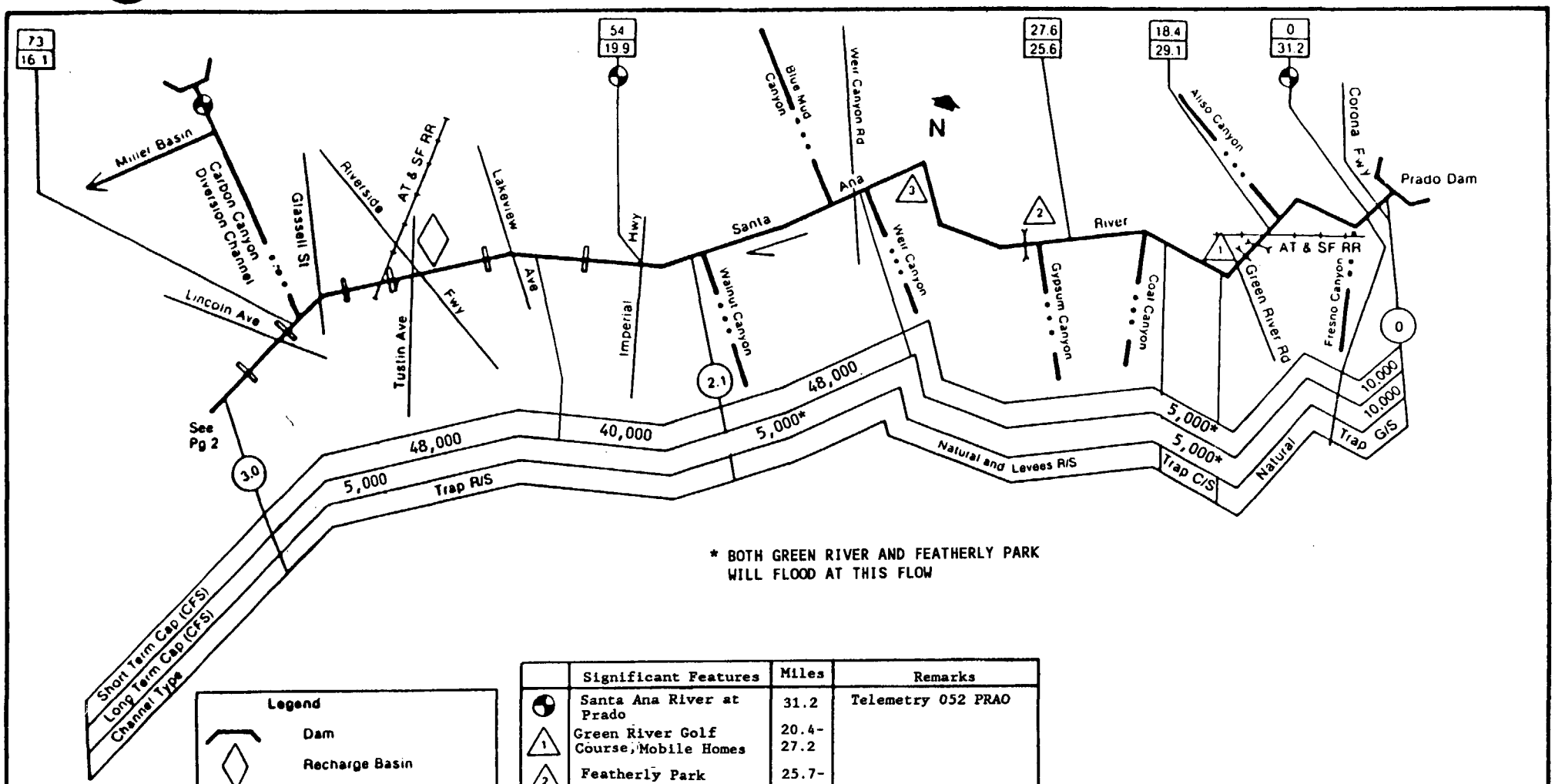
* Data from official records of the Corps of Engineers' Reservoir Regulation Section.

** The WATER YEAR extends from October 1 of the previous year to September 30 of the indicated year. For example, water year 1985 extends from October 1, 1984 to September 30, 1985.

PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

MAXIMUM PEAK INFLOWS, OUTFLOWS AND WATER SURFACE ELEVATIONS FOR PERIOD OF RECORD

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT



* BOTH GREEN RIVER AND FEATHERLY PARK WILL FLOOD AT THIS FLOW

Legend

- Dam
- Recharge Basin
- RD Rubber Dam
- Drop Structure
- Stream Gage
- Drainage Area / Miles From Stream Mouth
- Travel Time (Hours)
- Foot Bridge
- U Channel Unlined
- R Rip Rap Side Slopes
- S Soil Bottom
- C Concrete
- G Grouted Stone
- G/C Side Slope / Bottom
- L Levee

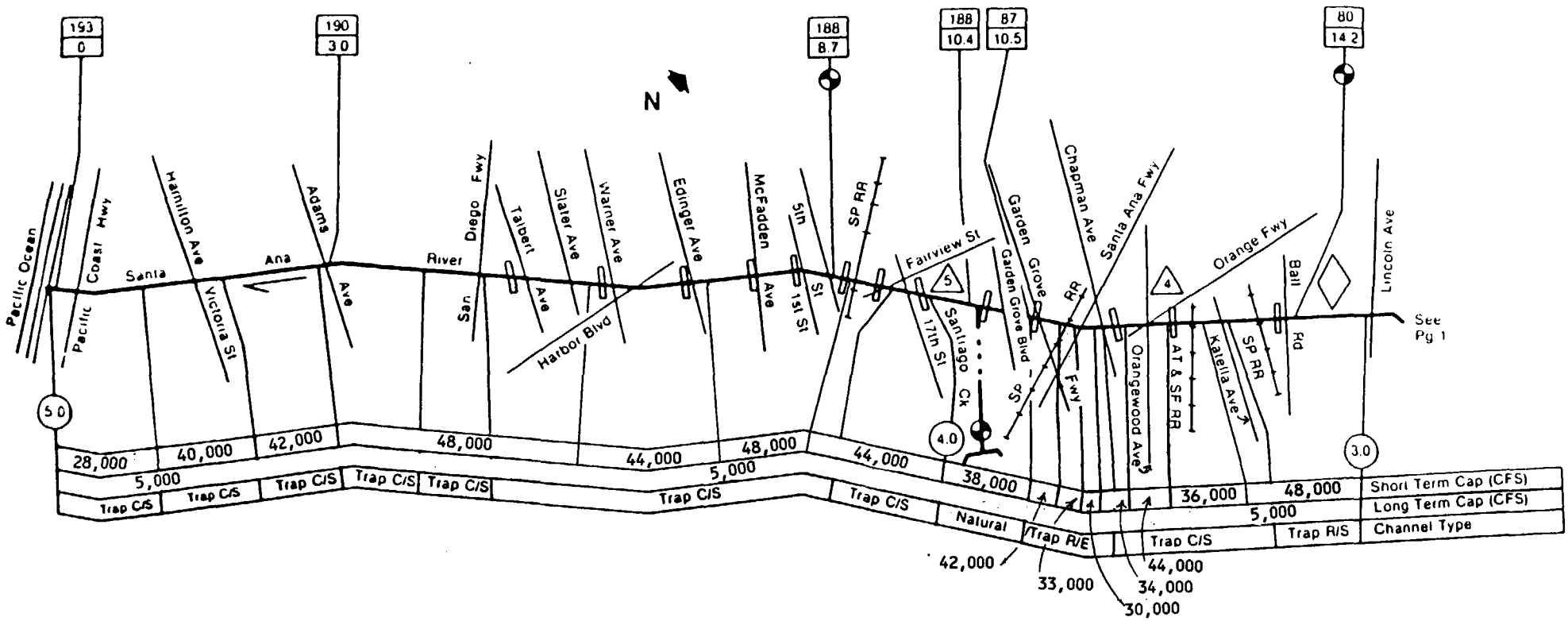
	Significant Features	Miles	Remarks
	Santa Ana River at Prado	31.2	Telemetry 052 PRAO
1	Green River Golf Course, Mobile Homes	20.4-27.2	
2	Featherly Park	25.7-24.2	
	Footbridge at Featherly Park	24.6	Removable by Tow Truck (4-5 hrs) for flows over 500 CFS
3	Horseshoe Bend	23.6	Orchards, Savi and Bryant Levees
	Santa Ana River at Imperial	19.9	
	Santa Ana River Spreading Grounds	19.8-13.8	All flood discharge less than 2200 CFS flows into the Santa Ana River
	Carbon Canyon Diversion Channel	16.1	
			Flows exceeding 2200 CFS will split at Miller Retarding Basin

PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

DOWNSTREAM CHANNEL CAPACITIES AND CONFIGURATIONS PRADO DAM TO THE PACIFIC OCEAN

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 4-21a



Legend

- Dam
- Recharge Basin
- RD Rubber Dam
- Drop Structure
- Stream Gage
- Drainage Area
- Miles From Stream Mouth
- Travel Time (Hours)
- Foot Bridge
- U Channel Unlined
- R Rip Rap Side Slopes
- S Soft Bottom
- C Concrete
- G Grouted Stone
- G/C Side Slope / Bottom
- L Levee

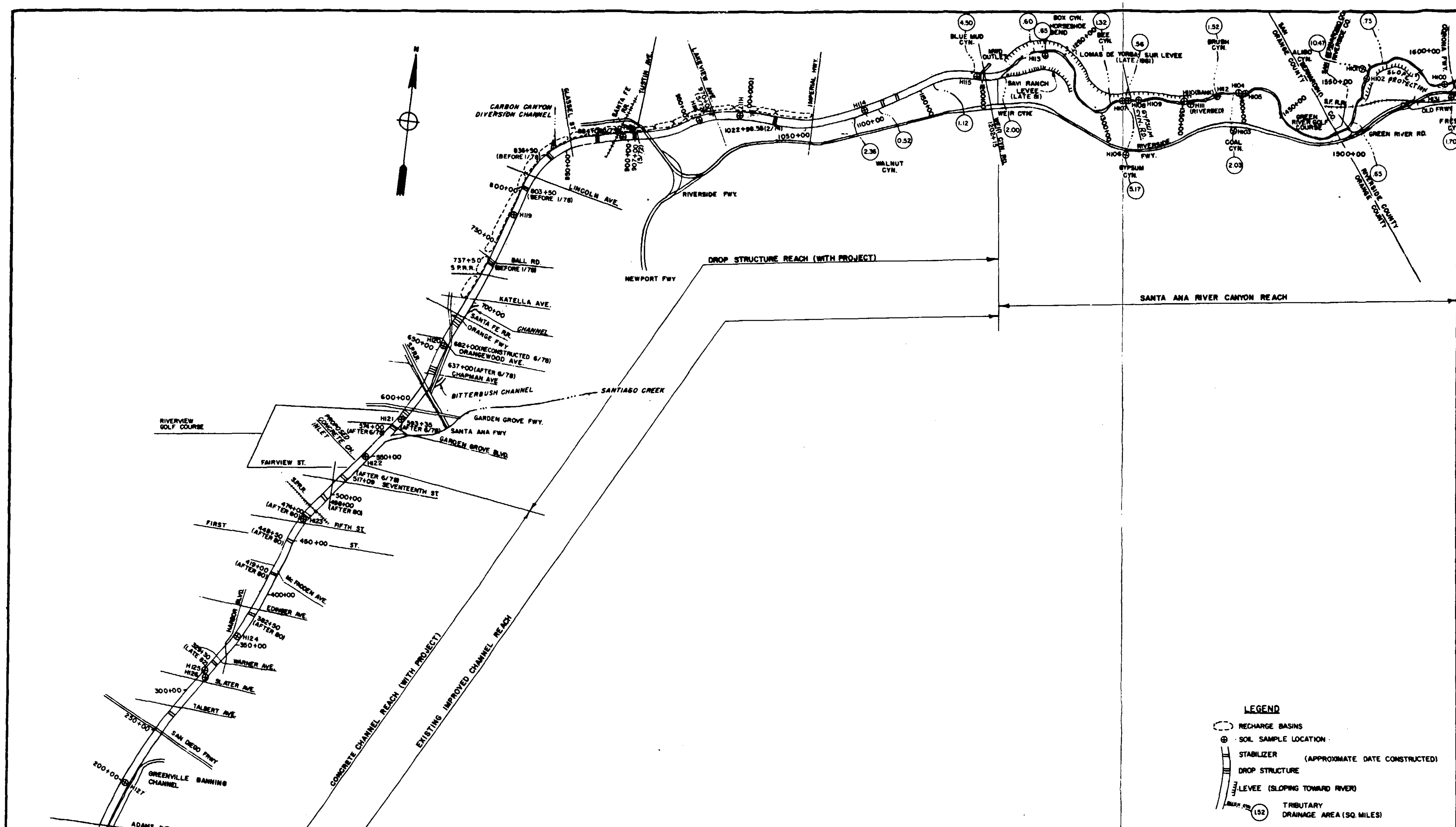
	Significant Features	Miles	Remarks
	Santa Ana River At Ball Road	14.2	
4	Anaheim Stadium	12.8	
5	Riverview Golf Course	11.9-9.9	
	Santiago Creek at Santa Ana	10.4	Flows Regulated by Santiago Dam and Villa Park Dam
	Santa Ana River at Fifth St	8.7	Telemetry 011 SAR5

PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

DOWNSTREAM CHANNEL CAPACITIES AND CONFIGURATIONS PRADO DAM TO THE PACIFIC OCEAN

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

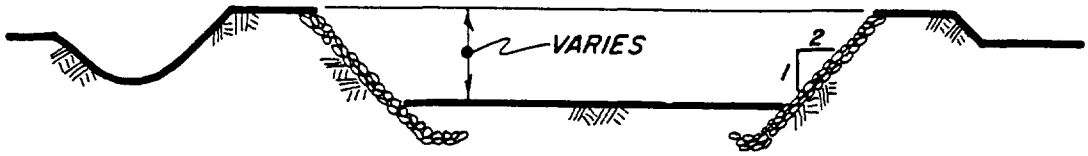
PLATE 4-21b



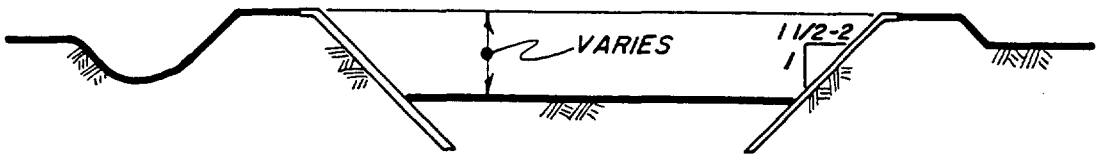
PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

EXISTING CONDITIONS
ON SANTA ANA RIVER
BELOW PRADO DAM

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT



TYPE A: ROCK-REVETTED SIDESLOPES



TYPE B: CONCRETE SIDESLOPES

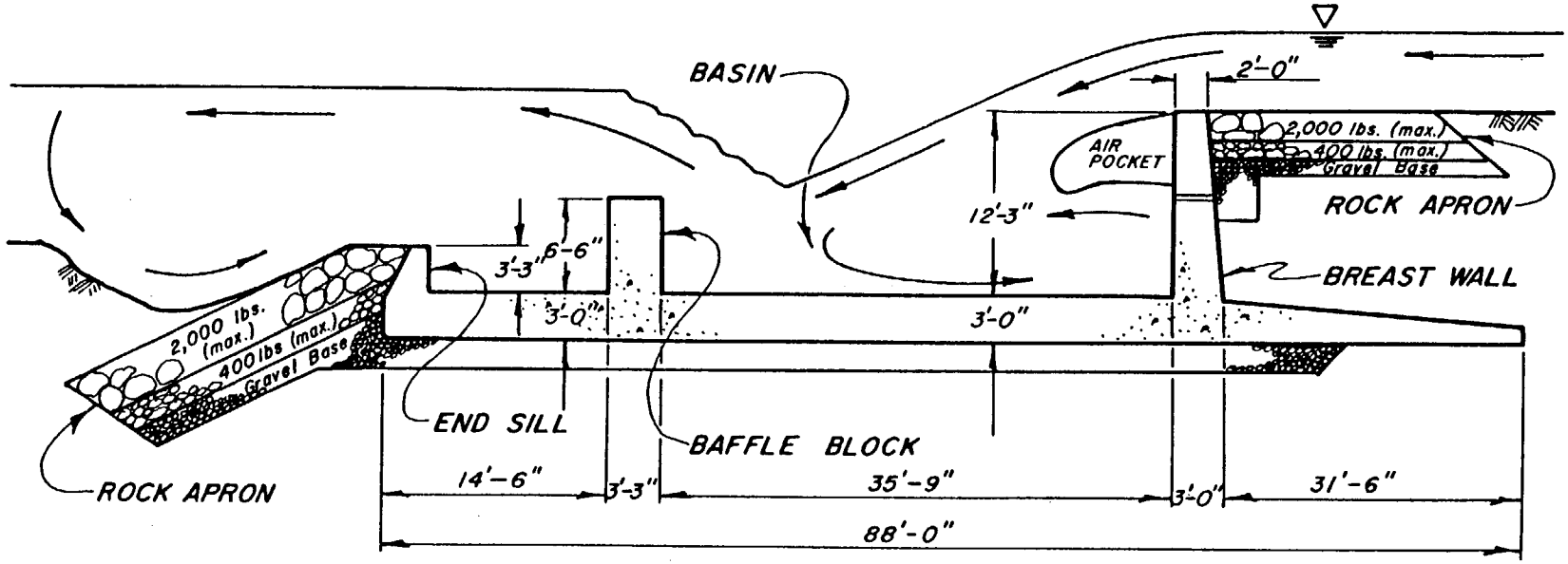
PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

TYPICAL IMPROVED SECTIONS

OF THE SANTA ANA RIVER

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 4-23



PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

TYPICAL DROP STRUCTURE
ON THE SANTA ANA RIVER

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 4-24

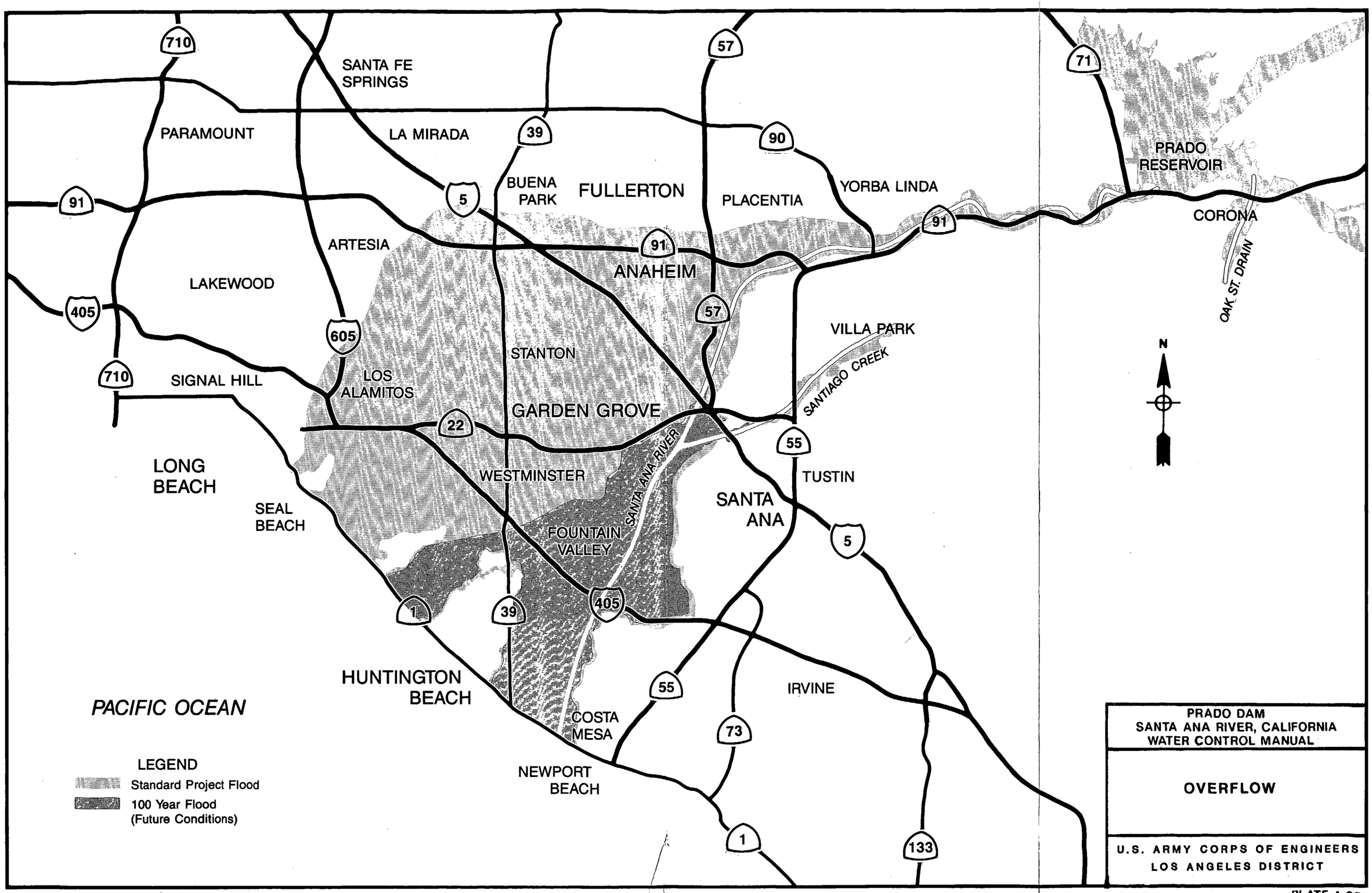
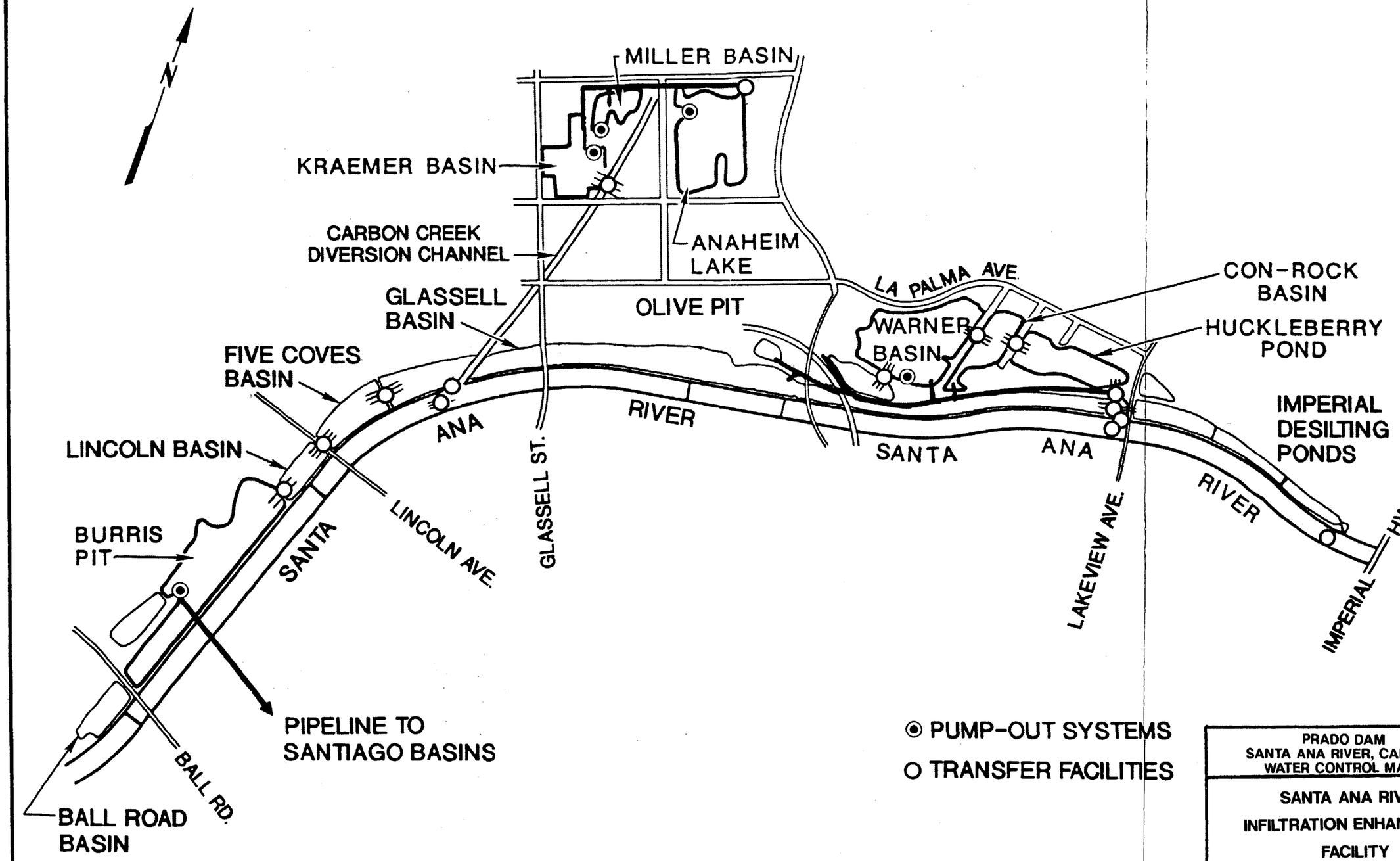

710
SANTA FE SPRINGS
57
71
PARAMOUNT
LA MIRADA
39
90
PRADO RESERVOIR
BUENA PARK
FULLERTON
PLACENTIA
YORBA LINDA
5
91
91
91
CORONA
ARTESIA
ANAHEIM
OAK ST. DRAIN
LAKEWOOD
405
57
605
VILLA PARK
STANTON
710
SIGNAL HILL
LOS ALAMITOS
SANTIAGO CREEK
GARDEN GROVE
22
55
LONG BEACH
WESTMINSTER
SANTA ANA RIVER
TUSTIN
SEAL BEACH
FOUNTAIN VALLEY
SANTA ANA
5
1
39
405
HUNTINGTON BEACH
55
IRVINE
PACIFIC OCEAN
COSTA MESA
73
NEWPORT BEACH
1
133
N
LEGEND
Standard Project Flood
100 Year Flood
(Future Conditions)
PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL
OVERFLOW
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 4-25

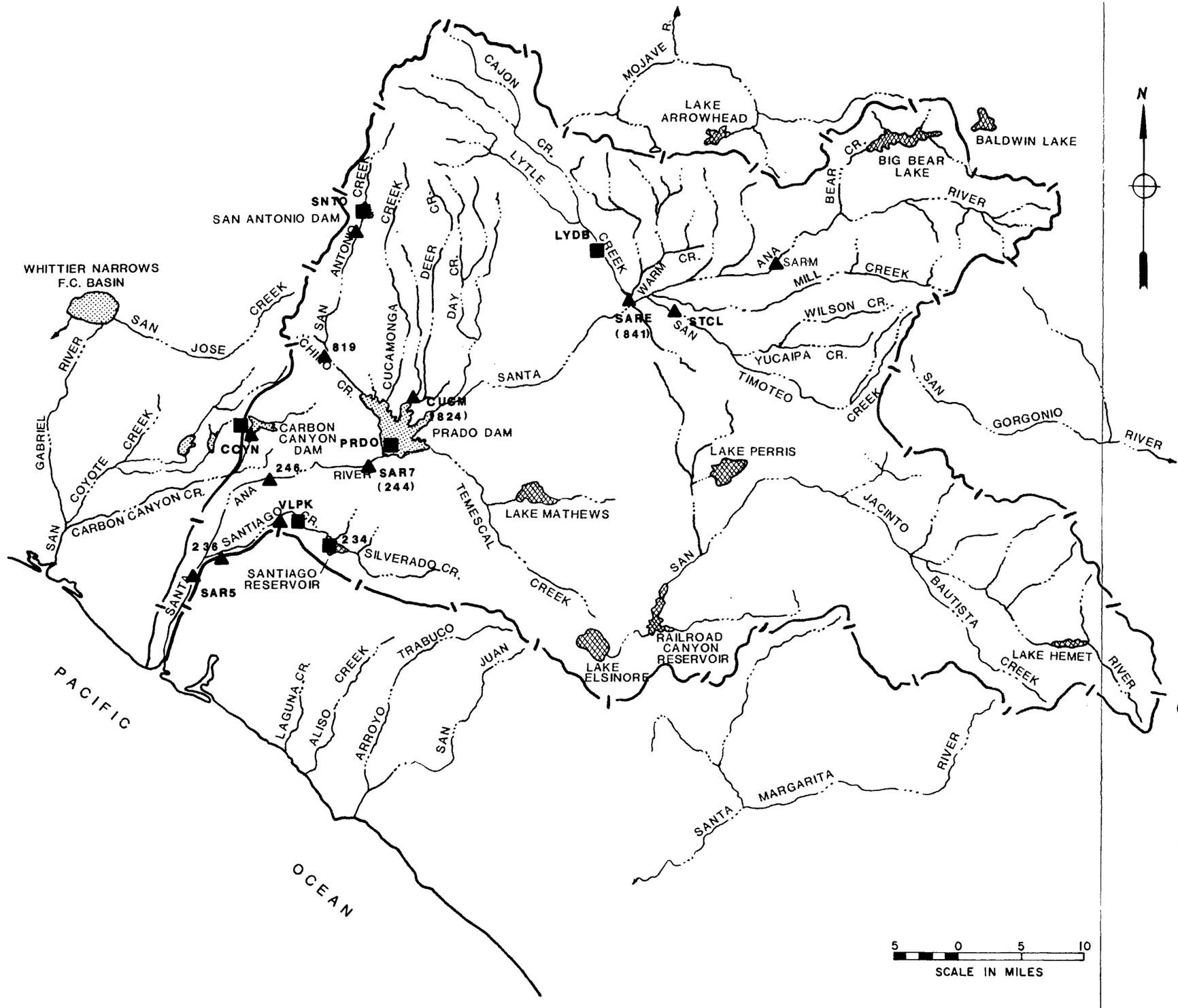


PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

SANTA ANA RIVER
INFILTRATION ENHANCEMENT
FACILITY

U. S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 4-26



LEGEND

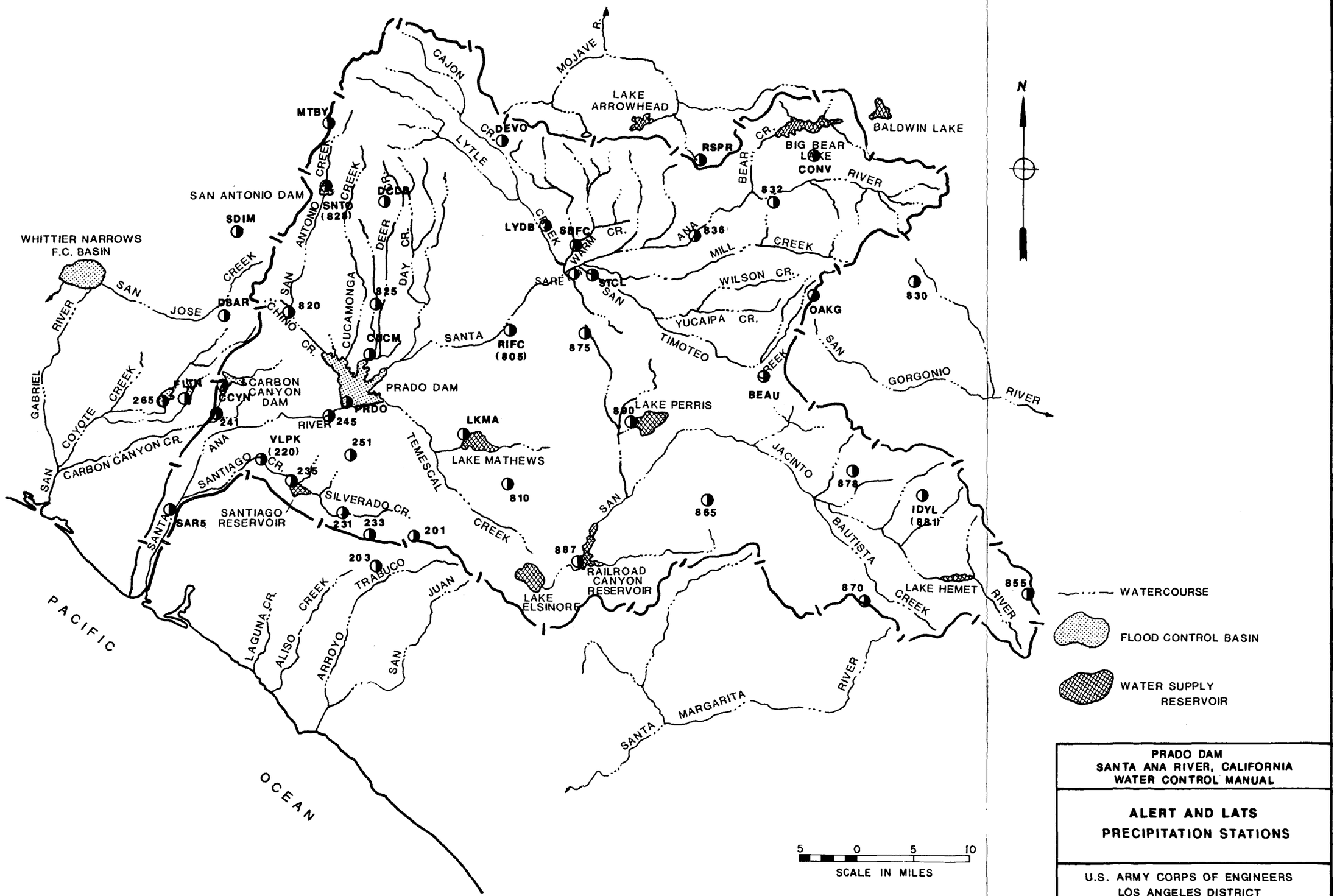
- ▲ STREAM GAUGE
- ■ RESERVOIR WATER SURFACE ELEVATION GAUGE
- WATERCOURSE
- FLOOD CONTROL BASIN
- WATER SUPPLY RESERVOIR

PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

ALERT AND LATS STREAM AND RESERVOIR GAUGING STATIONS

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 5-01



PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

ALERT AND LATS PRECIPITATION STATIONS

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 5-2

Hydrologic Instrumentation of Prado Dam

Parameter	Gauge Type	Report Mode	Stored Record (period available)	Comments
water surface elevation	staff boards	visual	Flood Control Basin Operation Report SPL 19 (1940-present)	
	Stevens A-35 recorder	visual	Reservoir Operation Report SPL 424 (1940 to present) paper strip chart (present) punch tape (1974-present)	float well
	D.R.*	telemetry	telemetry data file	
downstream gauge height	digital recorder*	visual	Flood Control Basin Operators Report SPL 19 (1940-present) punch tape (1974-present)	USGS operates the gauge, publishes the daily record and stores the paper punch tape for USGS Station ID #1107400
		telemetry	telemetry data file	
outlet gate opening	Gate Opening Indicator	visual	Flood Control Basin Operators Report SPL 19 (1940-present)	
	Stevens Type F Recorders		paper chart (1940-present)	
precipitation	tipping bucket gauge connected by magnetic sensor to D.R.*	telemetry	Reservoir Operation Report SPL 424 (1940-present) punch tape (1974-present) telemetry data file	tipping bucket type gauge Installed in 1985
	Belfort recording gauge	none	paper chart (1940-present)	data on paper charts is evaluated for daily rainfall amounts and charts are then sent to NWS in Asheville, N.C. for publication
	glass raintube	visual	Rainfall Record SPL 31 (1940-present)	

*Digital Recorder - A devise that converts gauge motion into coded digital information and records this periodically as a pattern of punched holes in a paper tape.

PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

HYDROLOGIC INSTRUMENTATION OF PRADO DAM

U. S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 5-03

RESERVOIR COMPUTATIONS

☐ HOURLY ☐ DAILY

DAM	TIME OF READING (IF DAILY)	DATE

COMPUTED BY	CHECKED BY	DATA SOURCE

HR.	DA.	WATER SURFACE ELEV. FT.	STORAGE AC. FT.	GATE STEP NO.	INST. OUTFLOW		
					OUTLETS CFS	DOWNSTREAM G. HT. FT.	DOWNSTREAM FLOW CFS
PREVIOUS REPORT							
	1						
	2						
	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						
	19						
	20						
	21						
	22						
	23						
	24						
	25						
	26						
	27						
	28						
	29						
	30						
	31						

HRS.	STORAGE CHANGE ACRE-FEET	STORAGE CHANGE CFS	AV. OUTFLOW CFS	AV. INFLOW CFS	GATE SETTINGS FT.
TOTAL					
MEAN					

REMARKS

SPL FORM MAY 67 30 PREVIOUS EDITIONS MAY BE USED: REPLACES SPL FORM 28 WHICH MAY BE USED

ARMY - C. OF E. - LOS ANGELES

FLOOD CONTROL BASIN OPERATION REPORT

Reports Control Symbol SPLCO – 7

Name | Month | Year

Day	Reservoir W.S.Elev Time	Reservoir W.S.Elev Type of Gage	Reservoir W.S.Elev Gage reading in feet	Outlet channel Time	Outlet channel Gage height in feet	Gate operation Time	Gate opening in feet No.1	No.2	No.3	No.4	No.5	No.6	No.7	No.8	No.9	No.10	No.11	No.12	No.13	No.14	No.15	No.16	OPERATOR

REMARKS:

SPL FORM 1 DEC 72 19 EDITION OF 1 MAR 55 MAY BE USED

PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

EXAMPLES OF "RESERVOIR COMPUTATIONS"
AND
"FLOOD CONTROL BASIN OPERATION REPORT" FORMS

U. S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 5-04

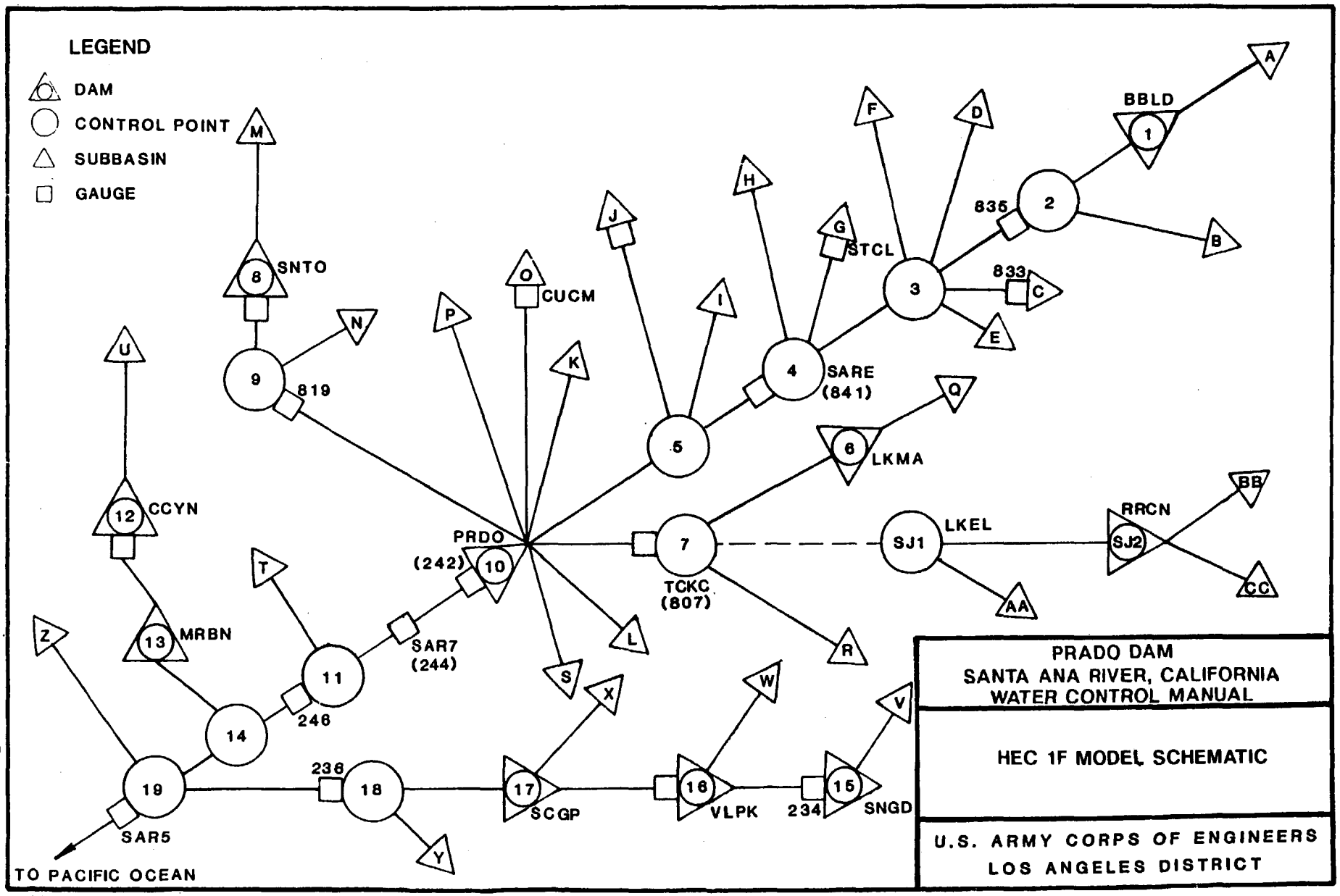
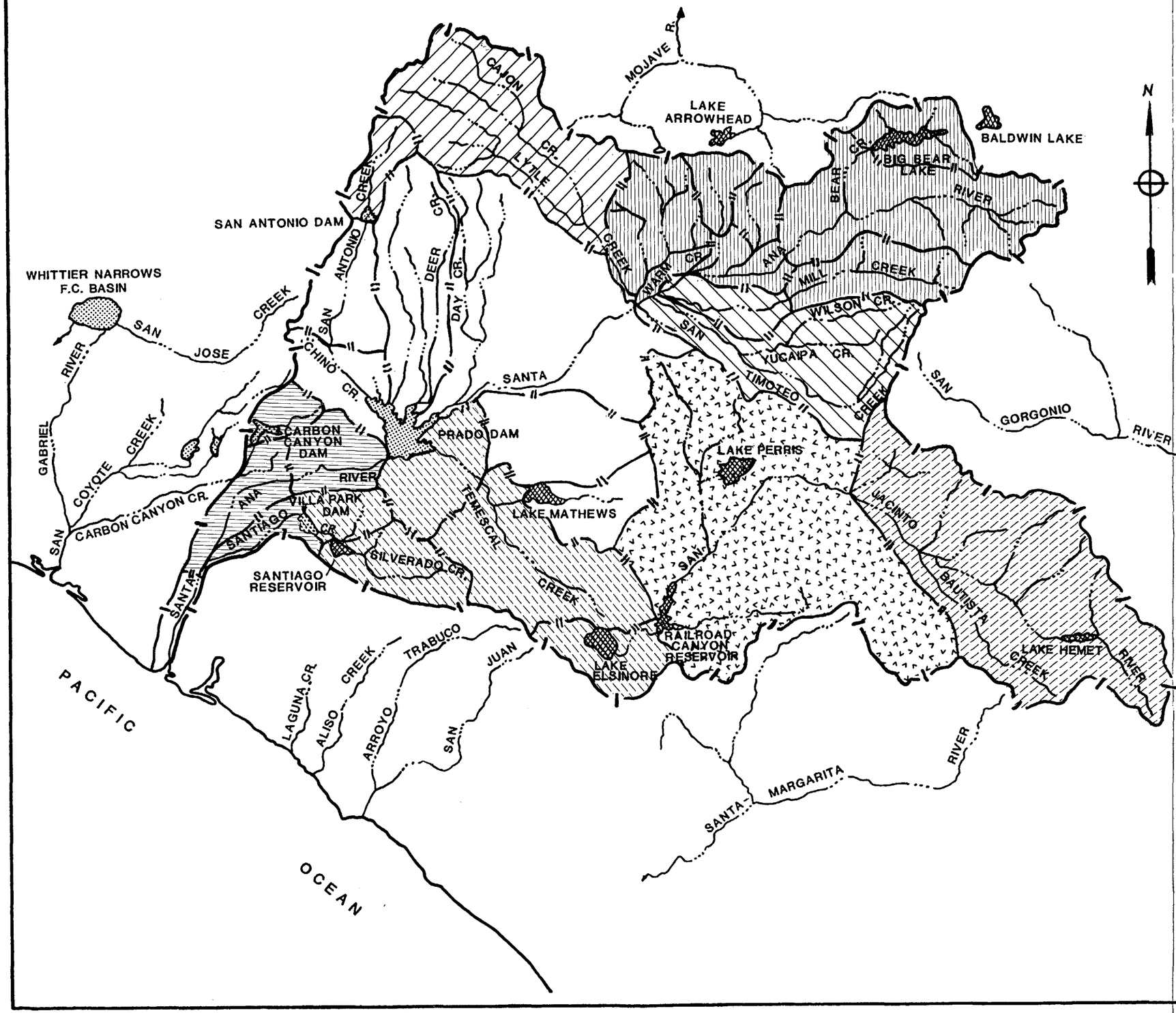


PLATE 6-01

NOTE: — — — — Indicates upstream drainage area rarely contributes to downstream control point.

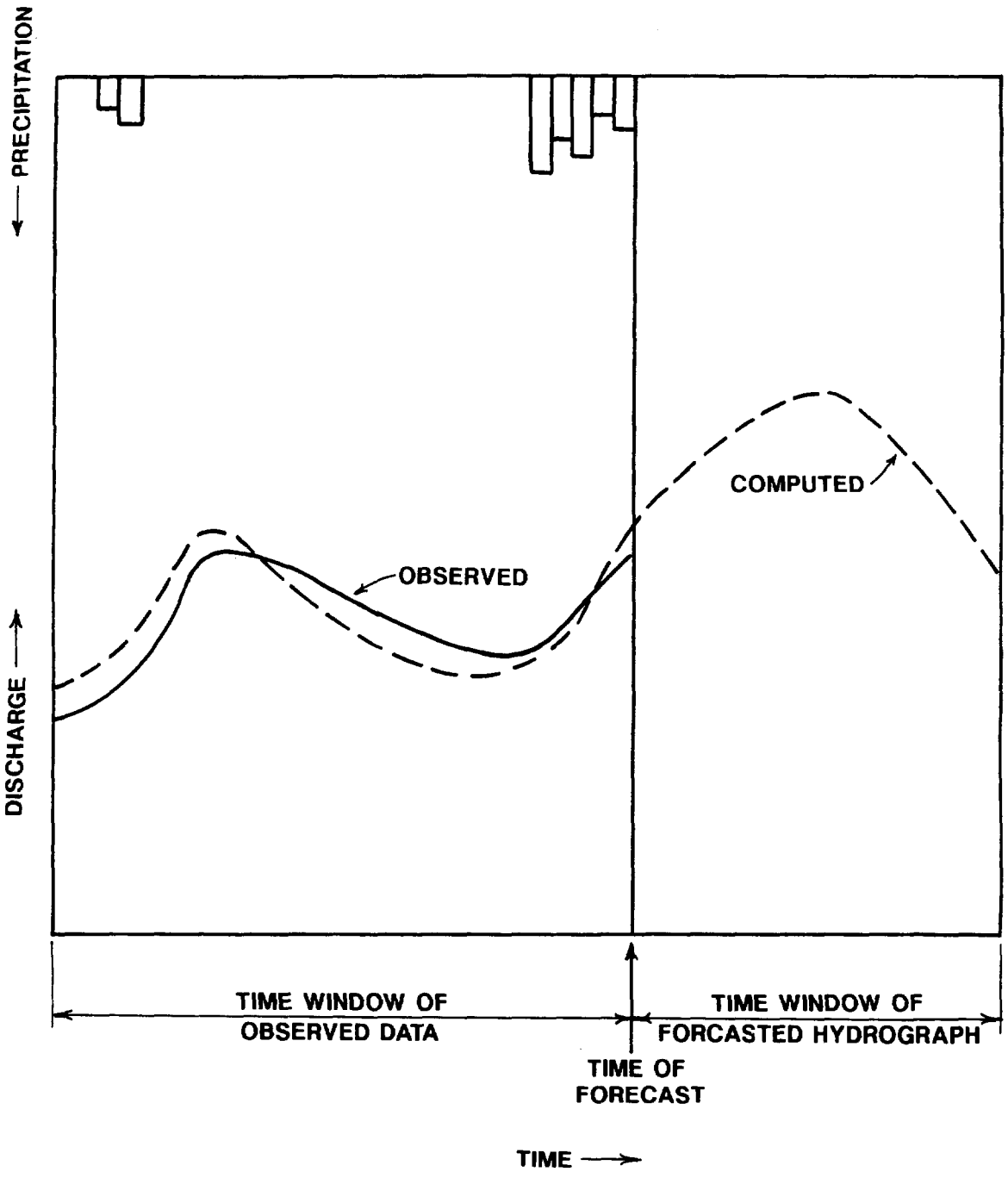


PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

PRECIPITATION ZONES

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 6-02

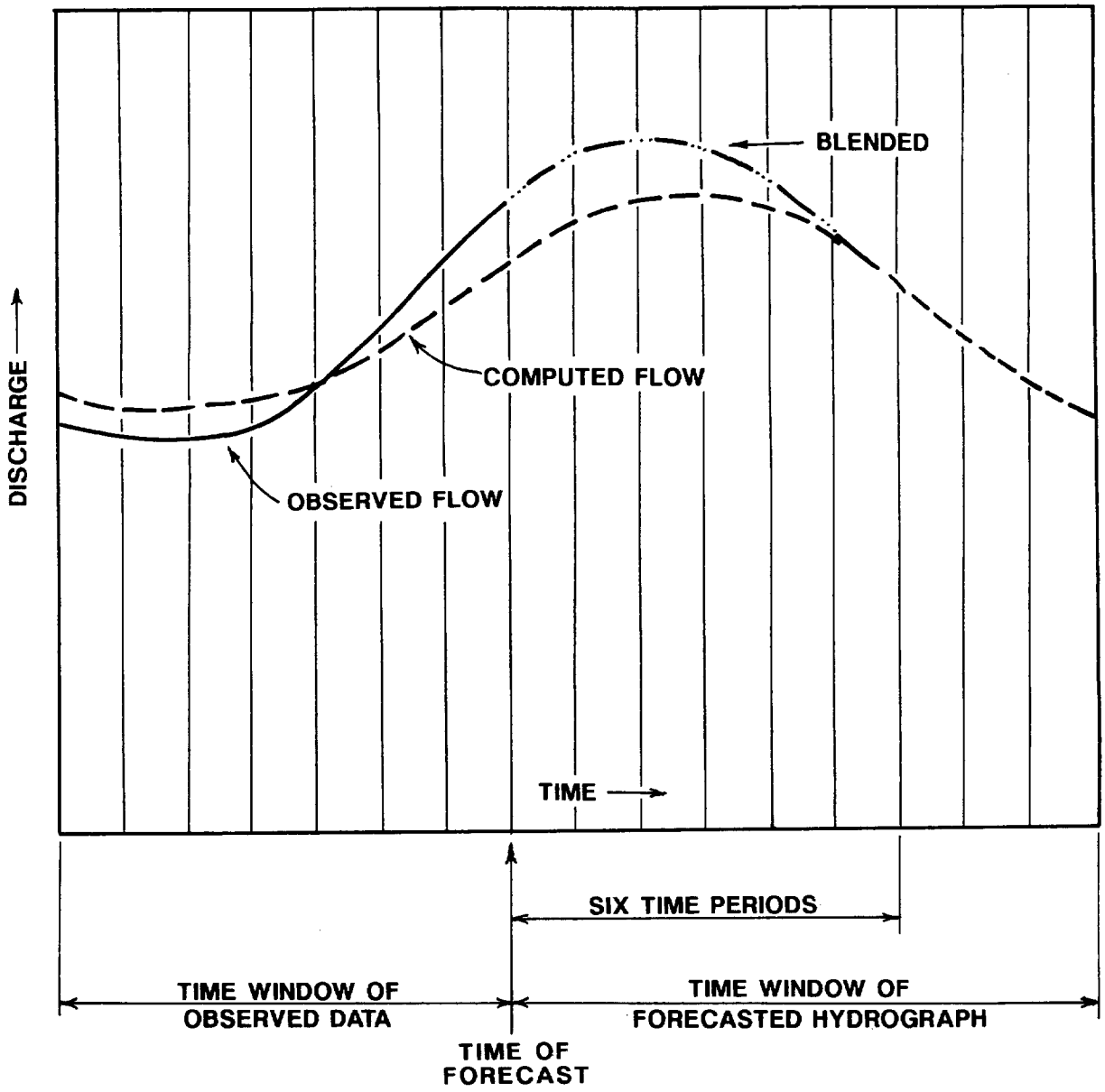


PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

HEC1F PARAMETER ESTIMATION
AND
FORECAST HYDROGRAPH PROCESS

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 6-03

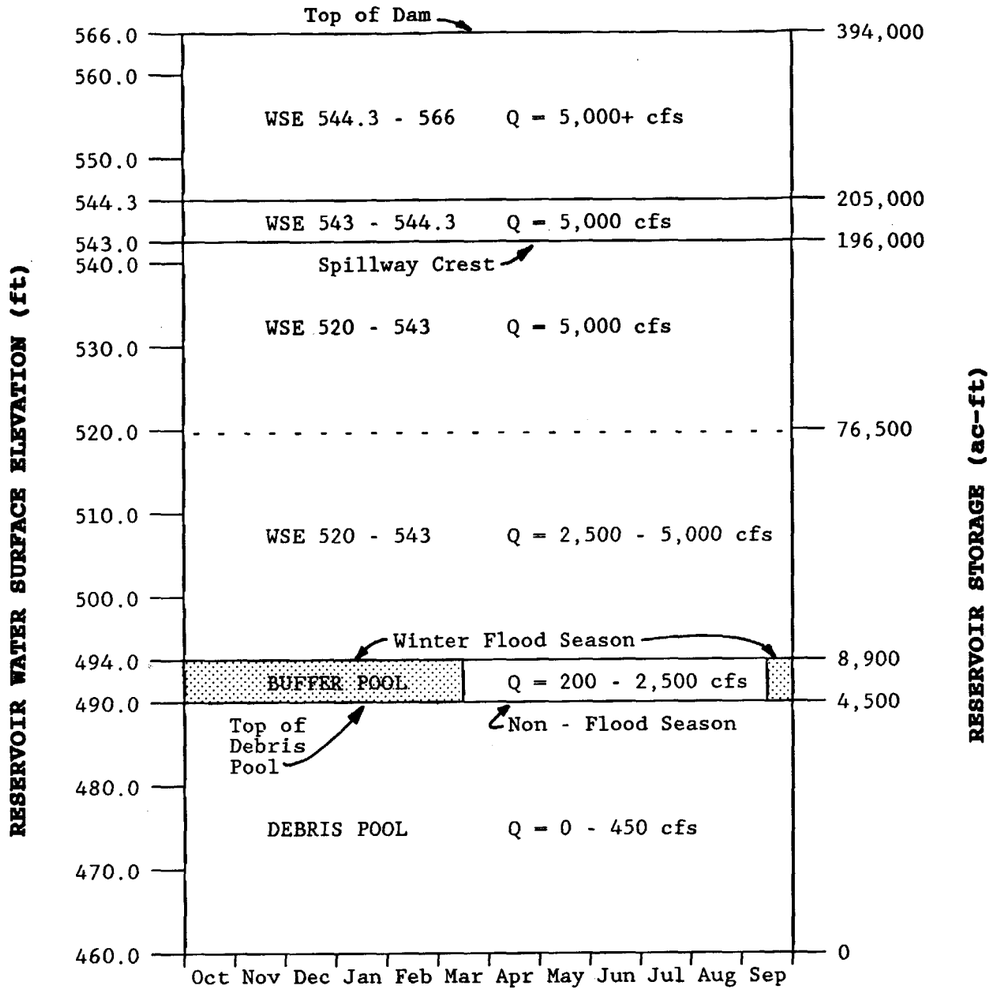


PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

HEC1F BLENDING PROCESS

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 6-04



Prado Dam Release Ranges

Release Range for the following Reservoir Elevations	Description
WSE 460 - 490	A debris pool is allowed to form in order to prevent floating debris from being drawn down into the outlet works. Water within the debris pool is released at rates that equal OCWD capability to recharge the groundwater without waste to the Pacific Ocean.
WSE 490 - 494 *	Reservoir releases are maintained between 200 and 2,500 cfs. This release should produce little or no damage to the improved OCEMA channel downstream, even for long durations releases. Releases greater than 600 cfs will wash out OCWD's in-channel sand diversion dike and L-dikes.
WSE 494 - 520 **	Reservoir releases are maintained between 2,500 and 5,000 cfs. Maximum scheduled reservoir release equals 5,000 cfs. Historically, sustained releases greater than 2,500 cfs have resulted in severe invert degradation and significant structural damage along the lower Santa Ana River.
WSE 520 - 543	Reservoir stages above elevation 520-ft call for the maximum scheduled release of 5,000 cfs provided that the downstream OCEMA channel is in condition to safely covey the release.
WSE 543 - 544.3	Flood control releases through the outlet works are reduced as the reservoir pool level rises above the spillway crest so as to maintain flow from the spillway plus outlet works at a maximum outflow of 5,000 cfs.
WSE 544.3 - 566	All outlet gates are closed at reservoir pool levels above 544.3-ft. Uncontrolled spillway discharge only. Under the extremely remote circumstance that the dam embankment were in danger of overtopping, all outlet gates are to be opened fully to minimize the possibility of dam failure.

Footnotes:

The decision of the exact release will depend on storm and runoff conditions, as well as the condition of reservoirs and channels in the Santa Ana River watershed, and how the operational objectives of the dam can be met. The decision parameters are discussed in Chapter 7 of this water control manual.

* Between 15 September and 15 March a release magnitude between 200 and 2,500 cfs is computed based on a real-time forecast of inflow volume so as not to exceed WSE 494-ft. The minimum release will always be equal to the OCWD groundwater recharge capability.

Beginning March 15, the flexibility to store runoff up to WSE 494-ft must be further curtailed due to the beginning of the nesting season for the federally endangered least Bell's vireo. Reservoir releases will match inflow, up to 2,500 cfs, to prevent a rise in reservoir pool elevation that could inundate any nesting endangered species between WSE 490 and 494-ft.

** Release magnitude is computed based on not exceeding a WSE of 520-ft using forecasted reservoir inflow (current event plus succeeding events).

PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

PRADO DAM

WATER CONTROL DIAGRAM

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 7-01

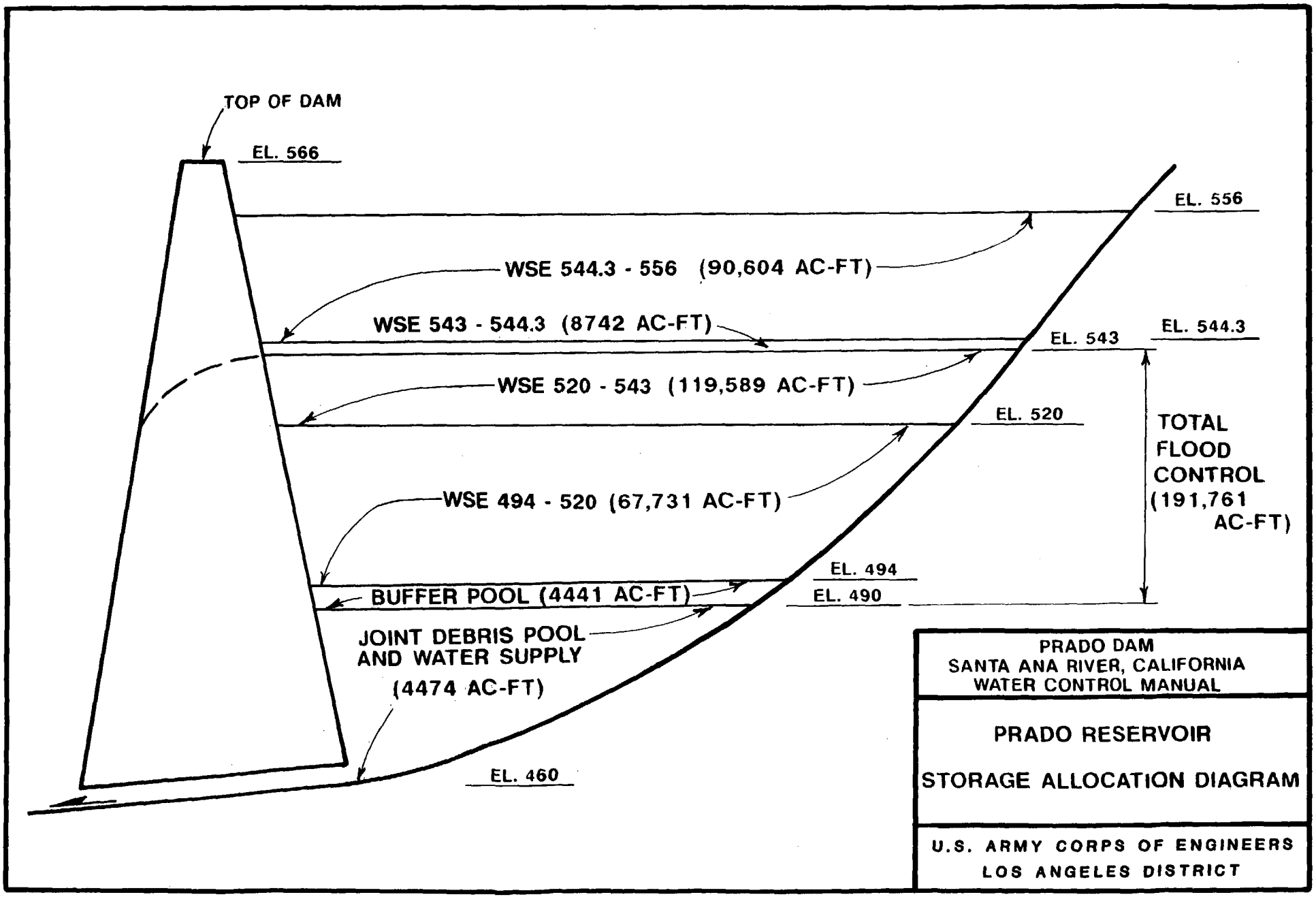
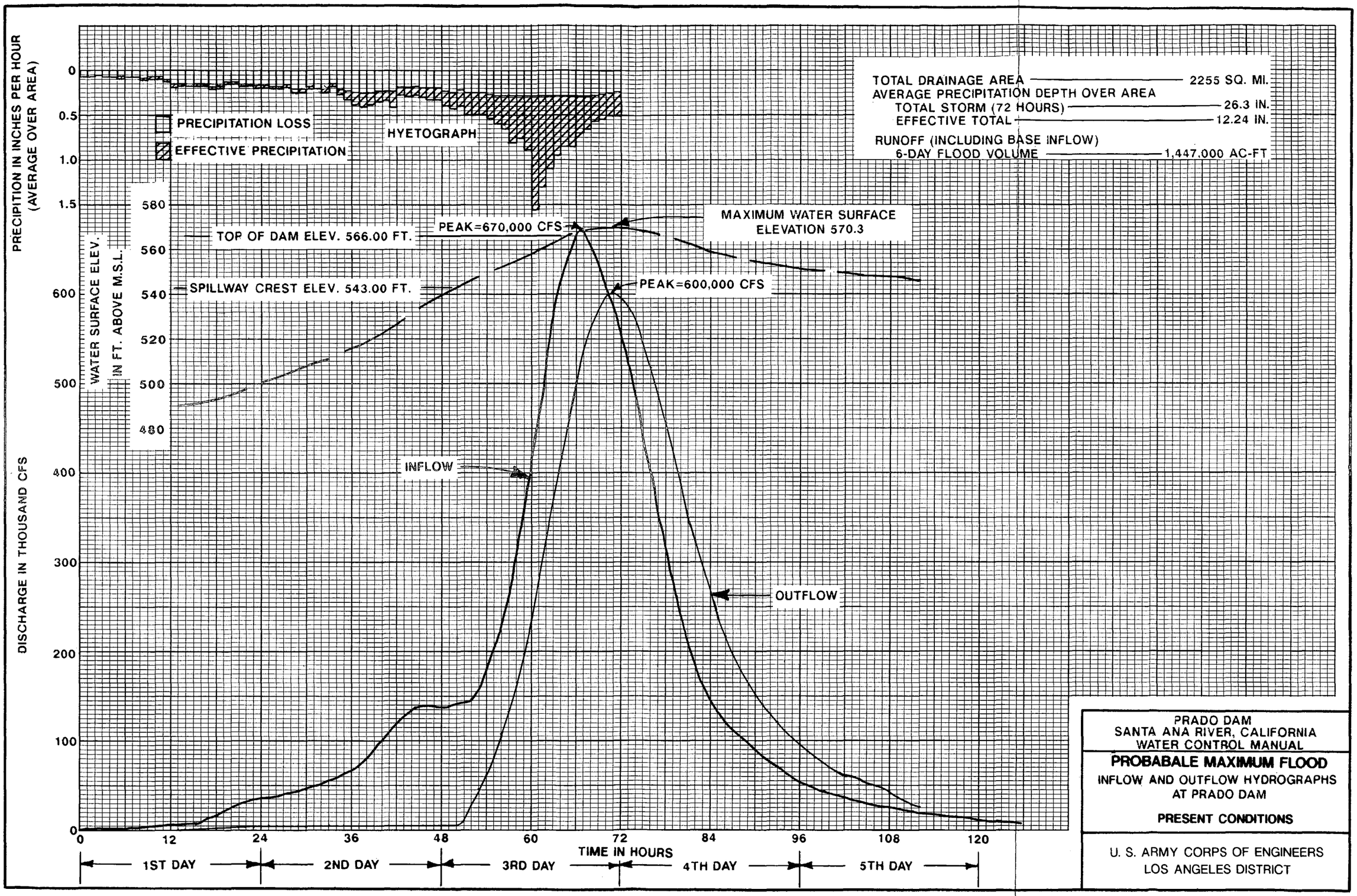

TOP OF DAM
EL. 566
EL. 556
WSE 544.3 - 556 (90,604 AC-FT)
WSE 543 - 544.3 (8742 AC-FT)
EL. 543
EL. 544.3
WSE 520 - 543 (119,589 AC-FT)
EL. 520
TOTAL FLOOD CONTROL (191,761 AC-FT)
WSE 494 - 520 (67,731 AC-FT)
EL. 494
BUFFER POOL (4441 AC-FT)
EL. 490
JOINT DEBRIS POOL AND WATER SUPPLY (4474 AC-FT)
EL. 460
PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL
PRADO RESERVOIR
STORAGE ALLOCATION DIAGRAM
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 7-02



PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

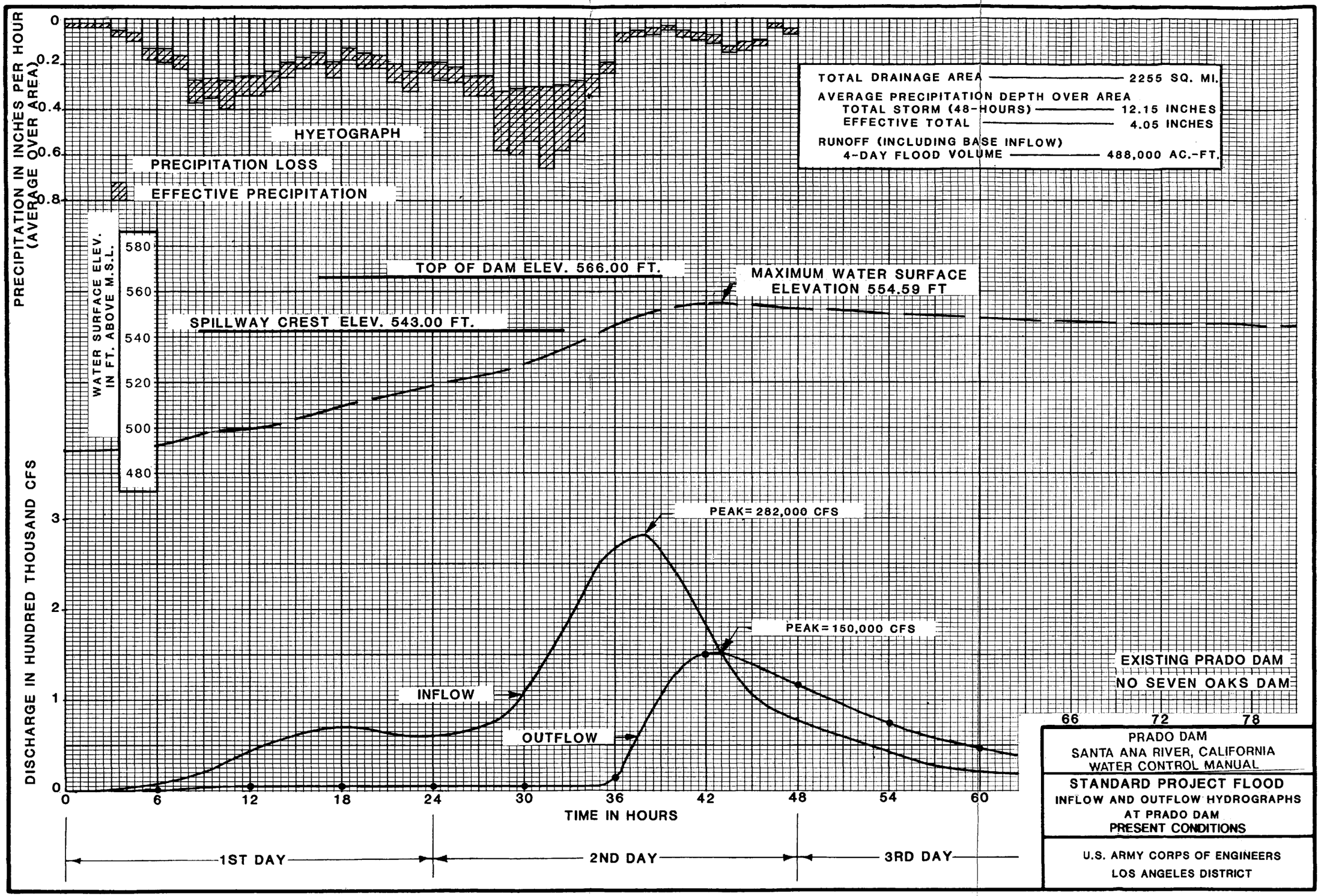
PROBABALE MAXIMUM FLOOD

INFLOW AND OUTFLOW HYDROGRAPHS
AT PRADO DAM

PRESENT CONDITIONS

U. S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 8-01

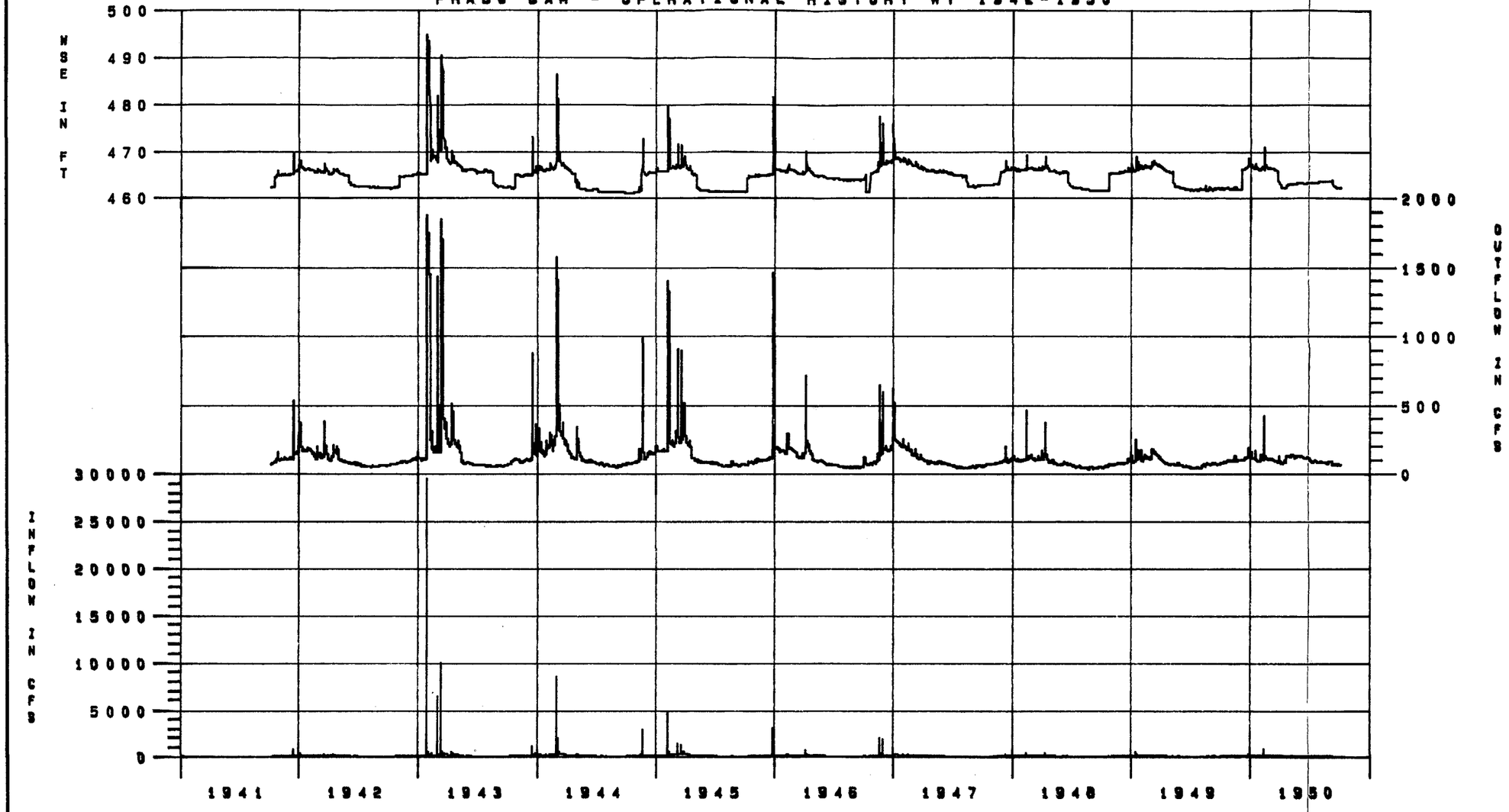


PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

STANDARD PROJECT FLOOD
INFLOW AND OUTFLOW HYDROGRAPHS AT PRADO DAM PRESENT CONDITIONS

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 8-02

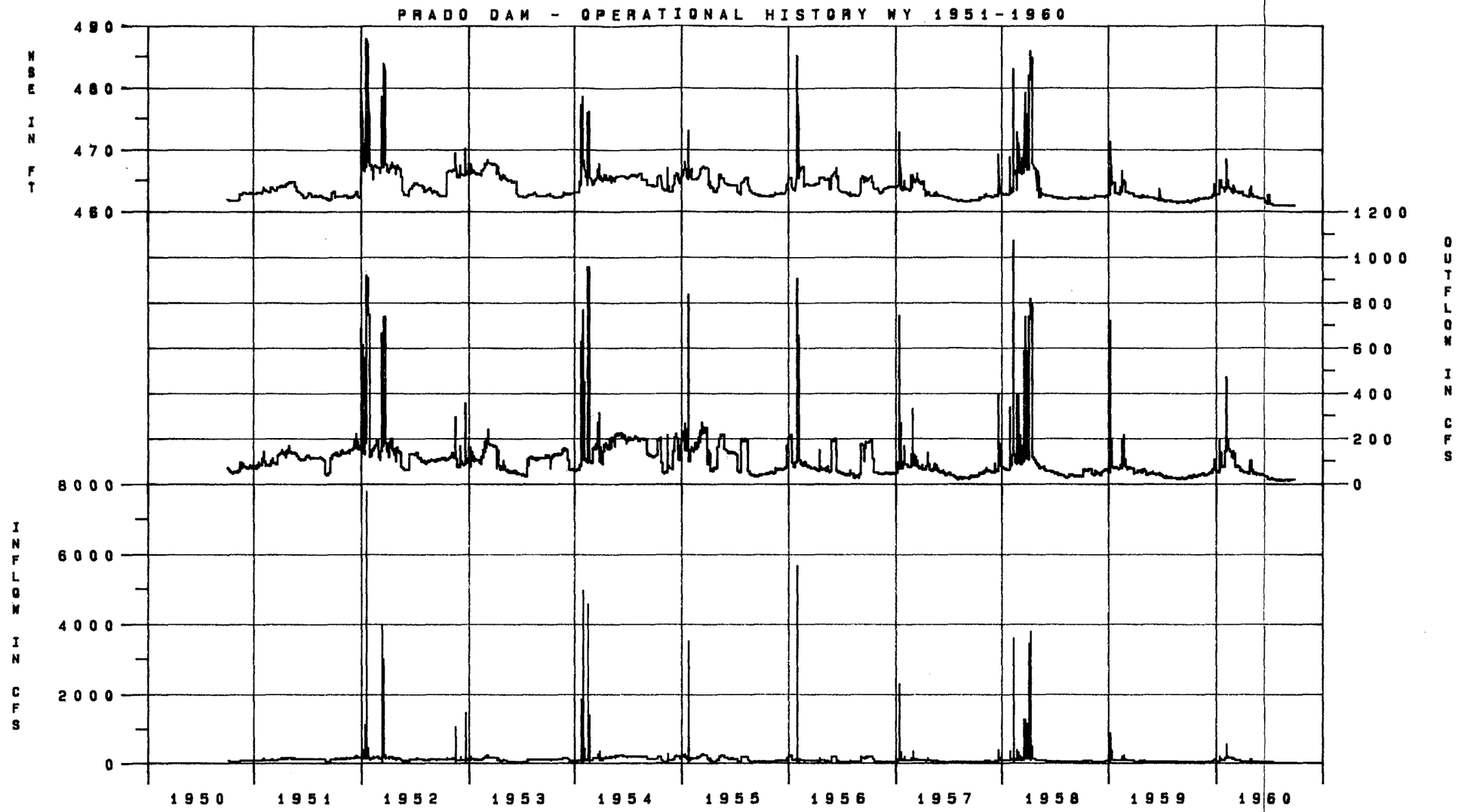


PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

OPERATIONAL HISTORY OF
PRADO DAM
WATER YEAR 1942-1950

U. S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 8-03a



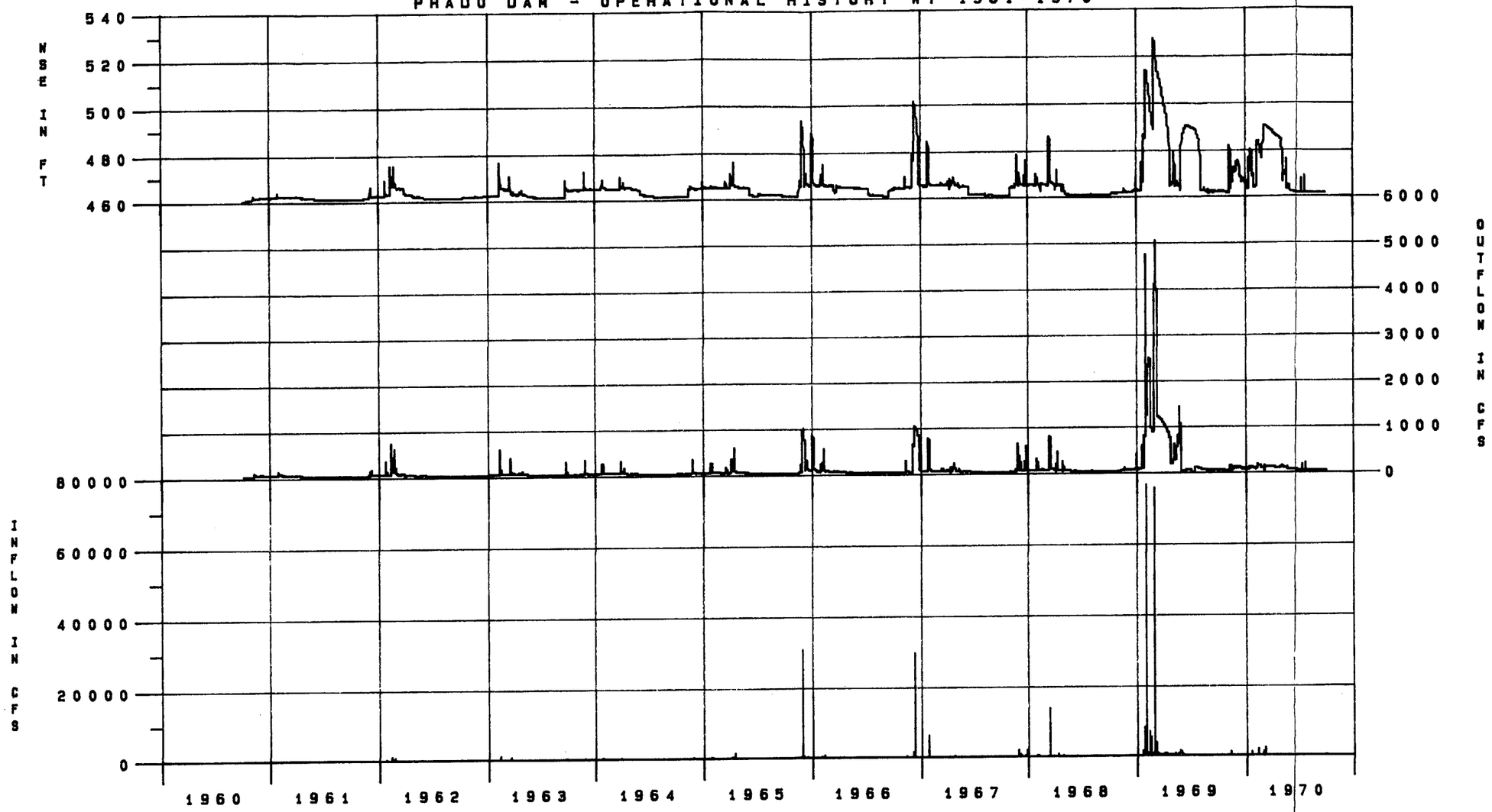
PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

OPERATIONAL HISTORY OF
PRADO DAM
WATER YEAR 1951-1960

U. S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 8-03b

PRADO DAM - OPERATIONAL HISTORY WY 1961-1970

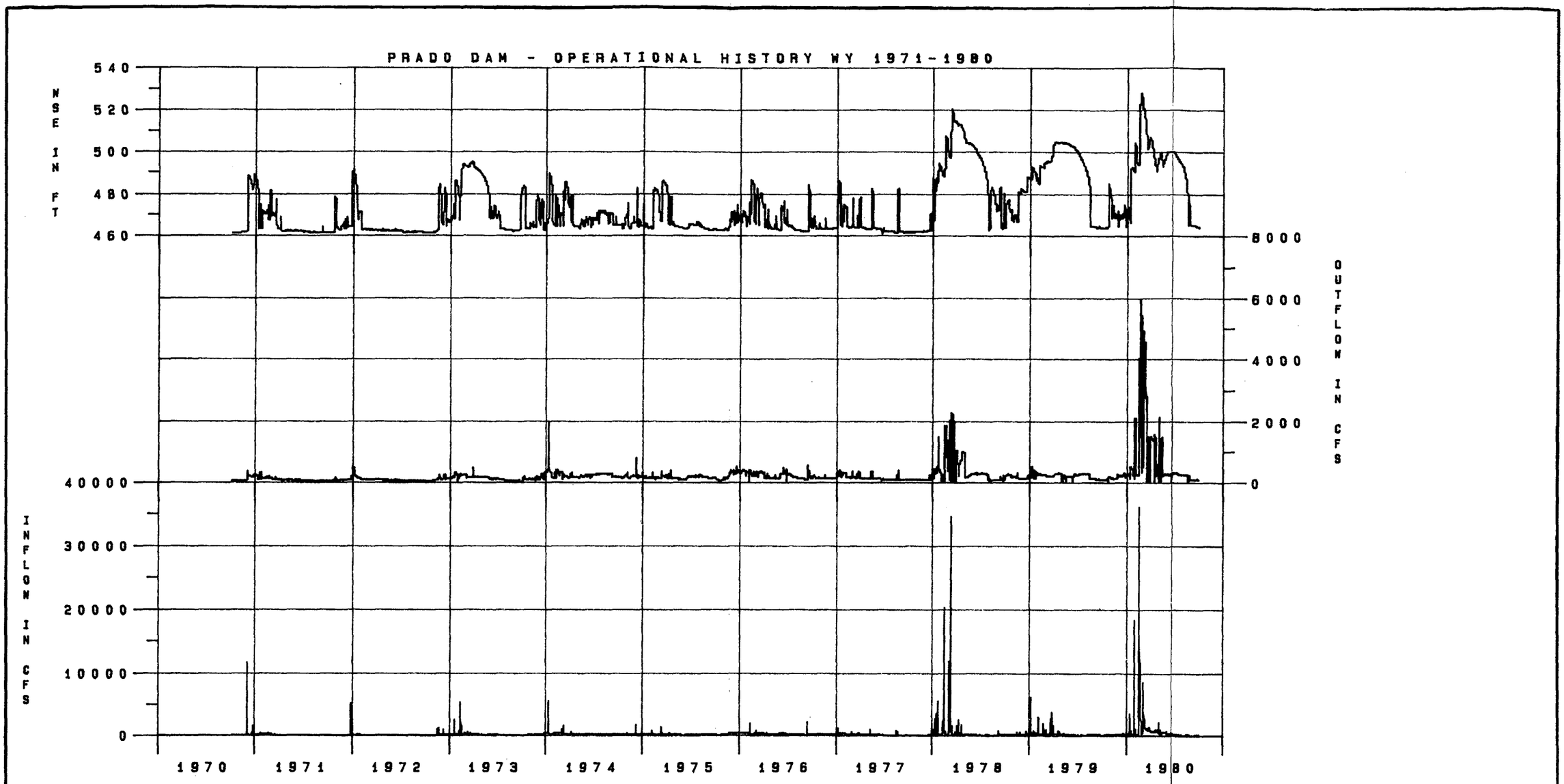


PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

OPERATIONAL HISTORY OF
PRADO DAM
WATER YEAR 1961-1970

U. S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 8-03c

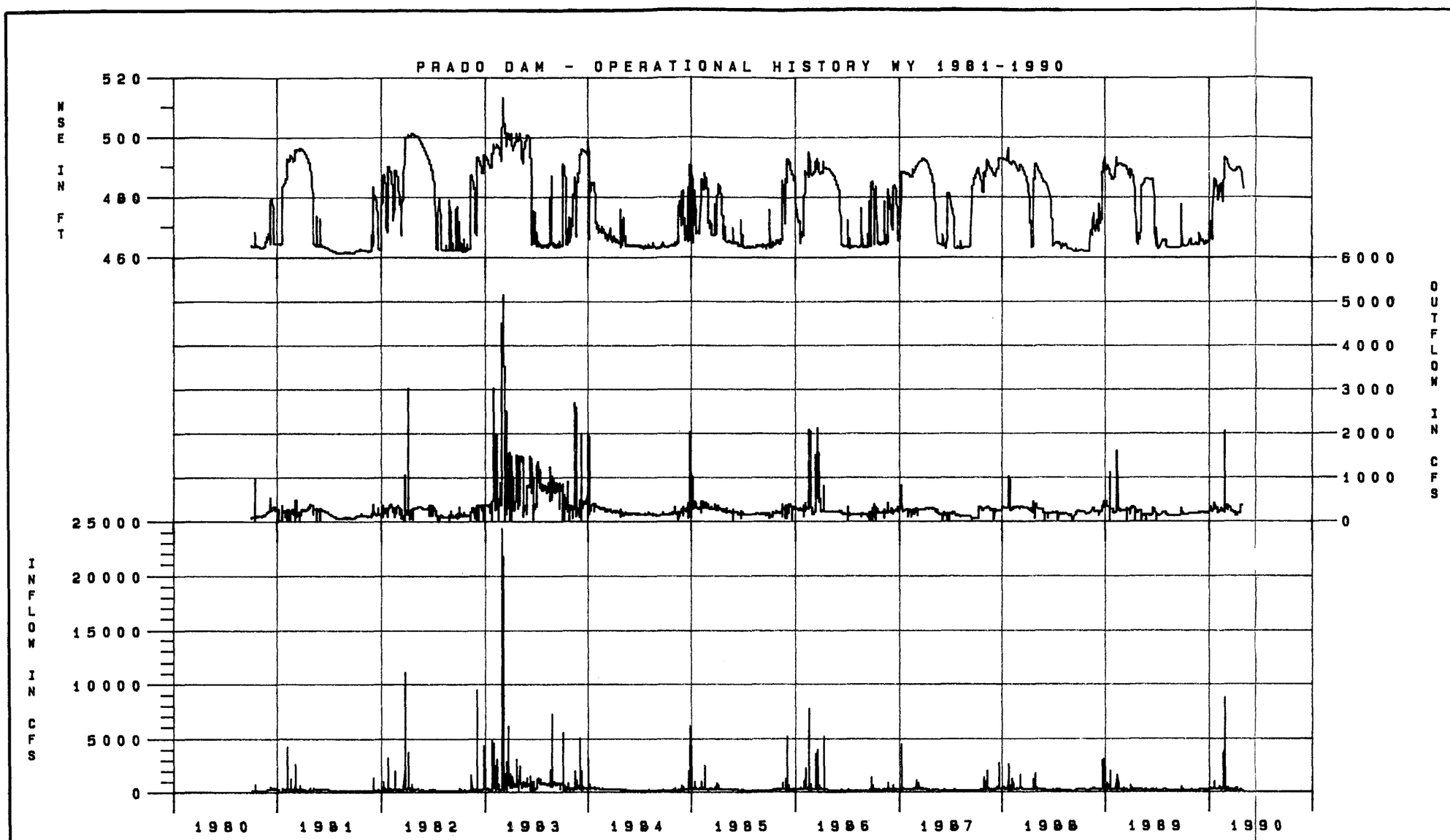


PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

OPERATIONAL HISTORY OF
PRADO DAM
WATER YEAR 1971-1980

U. S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 8-03d

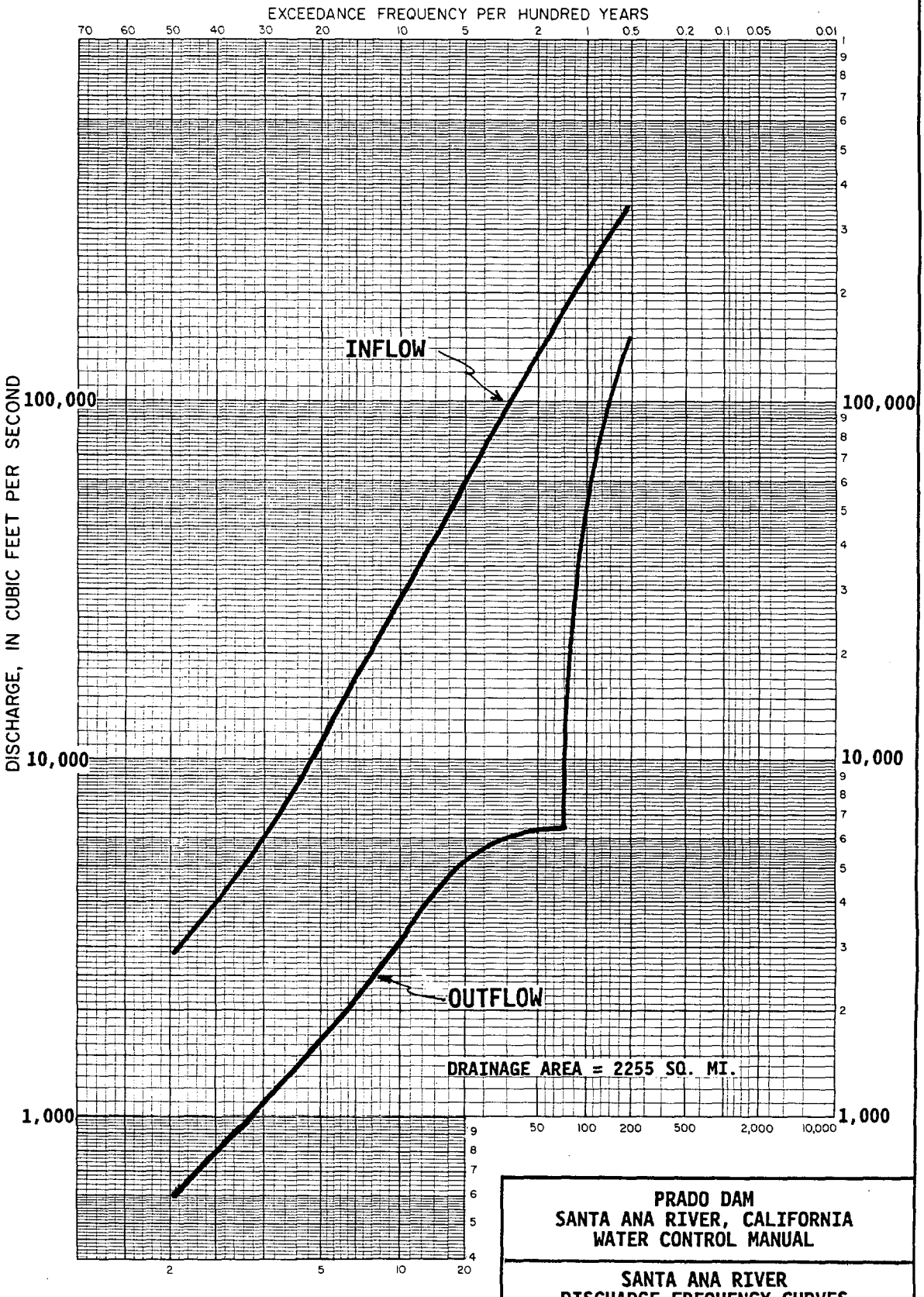


PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

OPERATIONAL HISTORY OF
PRADO DAM
WATER YEAR 1981-1990

U. S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 8-03e



PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

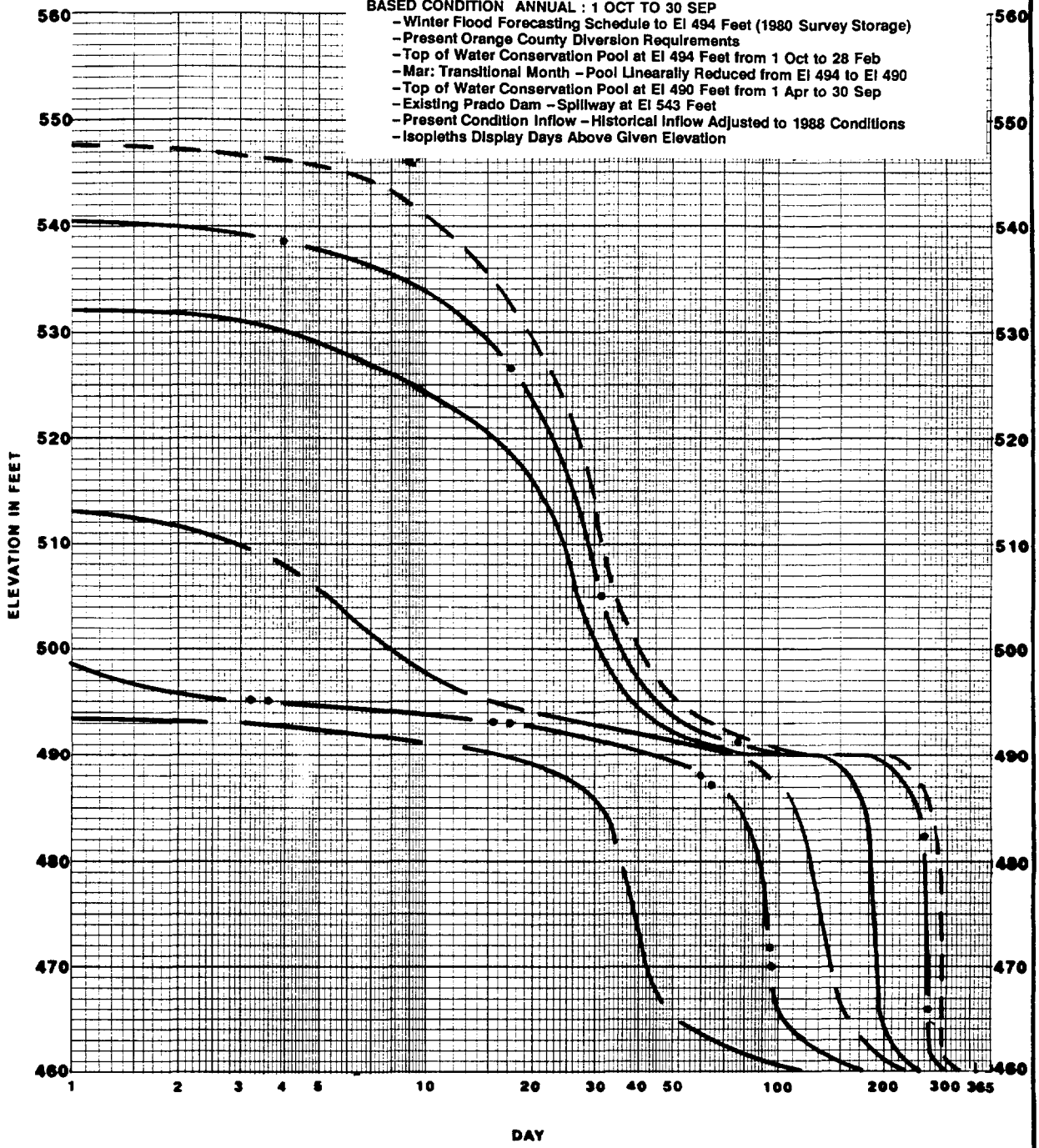
SANTA ANA RIVER
DISCHARGE-FREQUENCY CURVES
AT PRADO DAM
INFLOW AND OUTFLOW
PRESENT CONDITIONS

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 8-04

WINTER FLOOD FORECASTING SCHEDULE-SEASONAL POOL LOWERED TO EL 490
BASED CONDITION ANNUAL : 1 OCT TO 30 SEP

- Winter Flood Forecasting Schedule to El 494 Feet (1980 Survey Storage)
- Present Orange County Diversion Requirements
- Top of Water Conservation Pool at El 494 Feet from 1 Oct to 28 Feb
- Mar: Transitional Month - Pool Linearally Reduced from El 494 to El 490
- Top of Water Conservation Pool at El 490 Feet from 1 Apr to 30 Sep
- Existing Prado Dam - Spillway at El 543 Feet
- Present Condition Inflow - Historical Inflow Adjusted to 1988 Conditions
- Isopleths Display Days Above Given Elevation



LEGEND

— — — —	100-YR
—— • ——	50-YR
————	25-YR
—— - ——	10-YR
—— • • ——	5-YR
—— ——	2-YR

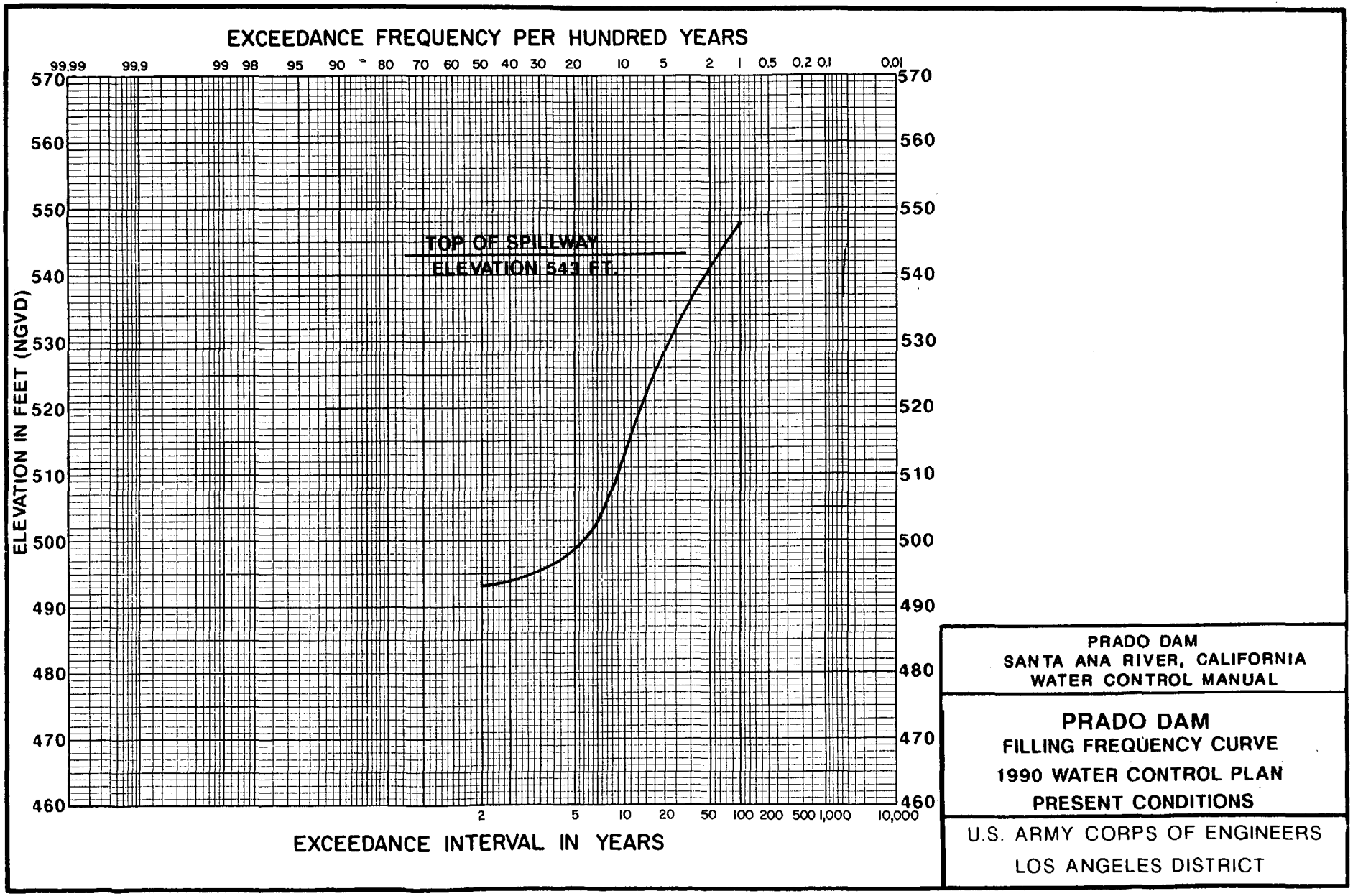
HIGHER RETURN PERIOD HAS PRIORITY.

PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

ANNUAL
ELEVATION-DURATION FREQUENCY CURVES
BASE CONDITION
WINTER FLOOD FORECASTING TO EL 494
SEASONAL POOL OPERATED TO EL 490
PRESENT CONDITIONS

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 8-05a

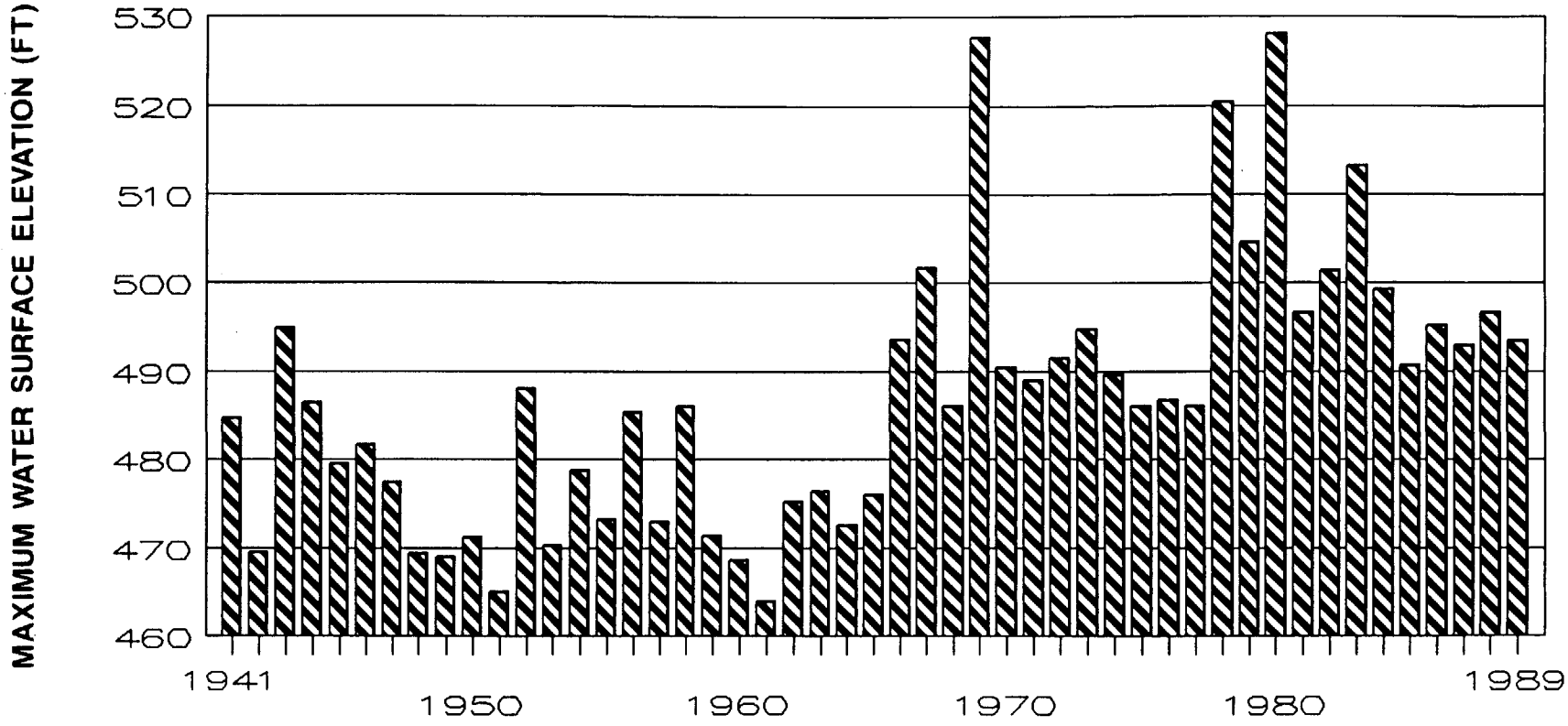


PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

PRADO DAM
FILLING FREQUENCY CURVE
1990 WATER CONTROL PLAN
PRESENT CONDITIONS

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 8-05b



PRADO DAM
SANTA ANA RIVER, CALIFORNIA
WATER CONTROL MANUAL

MAXIMUM POOL ELEVATIONS

1941 TO 1989

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 8-06